BASIC TESTS FOR PHARMACEUTICAL DOSAGE FORMS

WORLD HEALTH ORGANIZATION, GENEVA

The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this organization, which was created in 1948, the health professions of some 165 countries exchange their knowledge and experience with the aim of making possible the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.

By means of direct technical cooperation with its Member States, and by stimulating such cooperation among them, WHO promotes the development of comprehensive health services, the prevention and control of diseases, the improvement of environmental conditions, the development of health manpower, the coordination and development of biomedical and health services research, and the planning and implementation of health programmes.

These broad fields of endeavour encompass a wide variety of activities, such as developing systems of primary health care that reach the whole population of Member countries; promoting the health of mothers and children; combating malnutrition; controlling malaria and other communicable diseases, including tuberculosis and leprosy; having achieved the eradication of smallpox, promoting mass immunization against a number of other preventable diseases; improving mental health; providing safe water supplies; and training health personnel of all categories.

Progress towards better health throughout the world also demands international cooperation in such matters as establishing international standards for biological substances, pesticides, and pharmaceuticals; formulating environmental health criteria; recommending international nonproprietary names for drugs; administering the International Health Regulations; revising the International Classification of Diseases, Injuries, and Causes of Death; and collecting and disseminating health statistical information.

Further information on many aspects of WHO's work is presented in the Organization's publications.

Basic tests for pharmaceutical dosage forms

The tests described in this manual are intended only to verify the identity of pharmaceutical preparations. They should not be used to replace pharmacopoeial monographs.

BASIC TESTS FOR PHARMACEUTICAL DOSAGE FORMS

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Contents

1. Introduction

The basic (simplified) tests described in this manual represent one of the many elements of quality assurance in the pharmaceutical supply system. They have been devised with the following objectives:

(a) to provide a simple and readily applicable method for verifying the identity of a drug substance, using a limited range of easily available reagents, when the labelling and physical attributes give rise to doubt;

(b) to provide a practicable means of confirming the identity of a drug, when a fully equipped laboratory is not available;

(c) to indicate if gross degradation has occurred in certain substances that are known to decompose readily under adverse conditions.

Basic tests are not, in any circumstances, intended to replace the requirements of *The International Pharmacopoeia*[a] or other pharmacopoeial monographs. These give an assurance of quality whereas basic tests merely confirm identity.

In several European countries, simple tests have already been endorsed by the national pharmaceutical associations for use at peripheral levels of distribution (wholesale premises, pharmacies) to verify the identity of pharmaceutical substances whenever the possibility of confusion arises and sometimes to exclude gross degradation or adulteration.

In 1986, the manual *Basic tests for pharmaceutical substances*[b] was published by the World Health Organization. It is now complemented by this volume, which contains tests for 150 pharmaceutical dosage forms, most of which are included in the *WHO Model List of Essential Drugs*.[c] Each of the tests described has been verified in at least four laboratories in different countries. Analogous tests for further dosage forms are in preparation and will be published separately.

Degradation during storage and transportation is of particular importance in tropical countries. Indeed, an expiry date determined for a temperate climate may be inappropriate in a tropical region even when high standards of packaging are met. For this reason, particular importance is accorded to visual

[a] *The International Pharmacopoeia*, third edition. Geneva, World Health Organization. Volume 1: *General methods of analysis*, 1979. Volume 2: *Quality specifications*, 1981. Volume 3: *Quality specifications*, 1988.
[b] *Basic tests for pharmaceutical substances*. Geneva, World Health Organization, 1986.
[c] WHO Technical Report Series, No. 796, 1990.

inspection of dosage forms, since this frequently provides a first vital indication of degradation. This also applies in cases where there are reasons to suspect quality defects due to poor manufacture, tampering or counterfeiting.

Basic tests need not be carried out by fully qualified pharmacists or chemists, but they should be performed by persons with some understanding of analytical chemistry such as that acquired in courses for pharmaceutical assistants.

Several tests are described for most preparations. Not all of these need to be applied to any one sample. If, however, there is any reason to suspect that the product is mislabelled or substandard, all tests described should be performed. By their nature, simplified tests cannot be totally reliable. An adverse result, even in one test, should be taken as a warning of potential unsuitability of a drug. In these circumstances, a final conclusion should not be drawn until a full analytical examination has been carried out in a properly equipped quality control laboratory.

The proposed tests are supplemented by advice on visual inspection and a short description of the minimum facilities and equipment needed to carry out the work. The reagents needed for testing dosage forms are listed at the end of this publication.

Comments on the tests described are invited and should be addressed to: Pharmaceuticals, World Health Organization, 1211 Geneva 27, Switzerland.

2. Recommended facilities

A full pharmacopoeial analysis of a drug substance or product can only be performed in an adequately equipped drug quality control laboratory. Recommendations are given in the twenty-ninth report of the WHO Expert Committee on Specifications for Pharmaceutical Preparations[a] on the design and organization of a modest quality control laboratory. A first step towards the development of such a laboratory would be the establishment of facilities for carrying out basic tests.

General requirements

The workplace should be well illuminated, preferably by indirect natural light. It should be air-conditioned or heated according to the climate. In the latter case, a closed convector heater or radiator should be chosen that can be operated without fire hazard. The doors should open outwards and all fire and safety regulations should be respected.

The floor covering should be continuous, fireproof and easily washable. The walls, the furniture, and the frames of the windows and doors should also be easily washable. All these elements should be of a neutral colour (preferably white or pale beige) to facilitate the evaluation of colour reactions.

Furniture

Work-benches should be placed against a wall and should receive natural light preferably from the left side. A fume cupboard or a table with a ventilator above it should be installed in one corner of the room.

The tops of work-benches should have a white or black acid-resistant plastic cover; a glass or ceramic top will result in increased breakage of glassware. Unpainted wooden surfaces should be impregnated with soft paraffin. Paints or resins used to protect these surfaces should be resistant to dilute acids. The work-benches should be of a height that enables work to be undertaken comfortably in both standing and sitting positions. They should include shelves and drawers that are not unnecessarily deep and are adapted to the items that will be stored in them. Chairs should be strongly built and stable.

[a] WHO Technical Report Series, No. 704, 1984.

Cupboards and glass cases should be easy to maintain and to clean and resistant to chemicals. Reagent shelves should be covered with unpolished glass plates and firmly fixed to walls or benches. Flammable solvents and concentrated mineral acids should be stored in tightly closed containers with a capacity of not more than 2 litres. Larger volumes held in stock should be stored in a separate room that complies with local fire safety requirements. Concentrated acids and ammonia solutions should be stored separately, preferably in a fume cupboard which should be recessed in the wall, lined with tiles or acid-resistant plastic, and fitted with a glass door in an acid-resistant plastic frame.

Laboratory services

All electric circuits and gas and water supplies must comply with local safety standards. All electric sockets should be fitted with automatic fuses.

Artificial lighting should not cast shadows, and all fittings should have a protective cover that is resistant to acids and solvents.

If no gas supply is available, alcohol burners or electric heaters may be used. Electric heaters should be equipped with heat-output regulators and the heating coil should be fully insulated. Flammable liquids must be heated in a water-bath.

Work-benches should be equipped with a water tap and a sink. Taps should be fitted with three bib valves, one of which is connected to the water-pump. The wastewater pipes must be resistant to acids and solvents.

To avoid contamination of distilled water by acid or ammonia fumes, the distillation apparatus and/or the ion-exchanger must be situated well away from working areas.

Good ventilation must be ensured. If there is no air-conditioning, windows should open freely.

3. Inspection

Visual inspection should precede any testing. As a first step, the packaging and the containers should be examined for defects or damage. The label should be checked to ensure that it provides the following information: the name of the drug; its strength, potency or concentration; the name of the manufacturer; the batch or lot number; and the expiry date. Repackaged drugs should also bear the control number of the responsible analytical laboratory.

Drug products with defective packaging or with incomplete, damaged or missing labels should preferably be referred to a fully equipped drug control laboratory.

Commonly encountered physical defects include:

- for tablets:
  - — excessive powder and/or pieces of tablets at the bottom of the container (from abraded, crushed or broken tablets);
  - — cracks or chips in the tablets, swelling, mottling, discoloration, fusion of tablets;
  - — appearance of crystals on the walls of the container or on the tablets;

- for capsules:
  - — hardening or softening, cracking, swelling, mottling or discoloration of the shell.

4. Determination of melting characteristics

Determination of melting point

Definition

The melting point is determined in a capillary tube. The expression "melts about ..." means that the temperature at which the substance is completely melted, as indicated by the disappearance of the solid, will be in the range ± 4 °C from the stated value, unless otherwise indicated.

Details of the procedure

The following technique is adequate for the determination of melting point:

Grind about 50 mg of the substance to be tested in a small mortar. Place the ground substance in a vacuum desiccator over silica gel or phosphorus pentoxide at room temperature and dry for about 24 hours (unless another drying procedure is given in the test sheet). Place the substance in a dry capillary tube of 1-mm internal diameter forming a column about 3 mm high. Heat the melting-point apparatus to a temperature 5–10 °C below the expected temperature of melting and adjust the heating so that the temperature in the chamber rises about 1 °C per minute. Introduce the capillary with the substance into the heated chamber and note the temperature when the sintered substance becomes completely transparent; this is considered to be the melting point.

Discussion

The difference between the purely theoretical definition of the melting temperature and the results obtained in practice is now widely recognized. A precise physical definition exists only for the so-called triple point, i.e., the temperature at which all three phases (solid, liquid and gaseous) are in equilibrium. The measurement of the triple point is achieved in a highly complicated experiment. Many compendia do not use this temperature, but describe melting intervals as observed in practice, when the formation of droplets, the softening of the substance or its sintering are considered to be the beginning of the melting process, while the formation of a clear and transparent drop of liquid is taken to be the end of the melting process.

In the case of pure substances that melt without decomposition, the beginning of melting can be observed with some certainty. For impure substances, the beginning of the melting process will vary, depending on the nature of the impurities. Therefore it has been proposed that in the basic tests the following

definition of melting point be used. This definition is similar to that used in *The International Pharmacopoeia*, to describe melting temperature:

> The melting point denotes the temperature at which the substance has just completely melted; this is indicated by the disappearance of the solid phase and complete transparency of the melt.

This approach has the disadvantage that, if impurities are present, their presence can only be deduced from the lowering of the melting-point value, as no observation is made of the melting interval. An increase in the latter usually indicates low purity of a substance. These considerations, however, have less importance for basic test identification, where this disadvantage is fully offset by increased reproducibility of the values of melting point determined according to the above procedure.

Melting behaviour

Definition

The expression "melting behaviour" used in the basic tests denotes the melting point of substances that melt with decomposition. It is also used for melting points above 250 °C to indicate that the reproducibility of the value may be low.

Discussion

It is necessary to bear in mind that a difference exists between true melting points (or melting ranges) and the temperature of decomposition. Ideally, in the case of a true melting point, no chemical change occurs in the substance. However, when some substances are heated, decomposition takes place either before or during the process of melting, being indicated by a change in the colour of the substance or by the evolution of a gas. In such situations, the observed temperature of melting is not a true melting point of the substance but the melting point of a mixture with decomposition products. It is obvious that the temperature of decomposition cannot be considered as a physical property of a substance as the amount of decomposition products, and consequently the temperature of decomposition, depend on the length of the period of heating and therefore have low reproducibility, even if a standardized procedure is used.

Determination of eutectic temperature

Definition

Eutectic temperature is given as a single value only and designates the beginning of melting, i.e., the temperature at which the solid collapses or forms drops on the wall of the capillary tube. The mixture to be used in the test is usually prepared by thorough mixing of approximately equal parts of the test substance and the accessory substance, unless the use of strictly equal amounts of both substances is specially indicated in the test procedure.

Details of the procedure

The following technique is adequate for the determination of eutectic temperature:

Grind equal parts (by weight) of the substance to be tested and the accessory substance, both of them previously dried for about 24 hours at room temperature in a vacuum desiccator over silica gel or phosphorus pentoxide. Fill a dry capillary tube, of 1-mm internal diameter, with the mixture, forming a column about 3 mm high. Heat the melting-point apparatus to a temperature 5–10 °C below the expected temperature of melting and adjust the heating so that the temperature in the chamber rises about 1 °C per minute. Introduce the capillary with the mixture into the heated chamber, and note the temperature at which the solid collapses or forms droplets on the wall of the capillary tube.

Discussion

The measurement of eutectic temperature has been introduced in the basic tests as an additional criterion of identity. An exact determination of the eutectic melting point requires a set of measurements carried out on mixtures prepared in different ratios. The eutectic melting point thus measured is thermodynamically exactly defined and may be used as a criterion of both identity and purity. Such a procedure is not, however, practical for the basic test project, as it requires a long time and adequate laboratory facilities. For the purpose of basic tests, the determination is carried out at a constant ratio of 1:1. However, this has the disadvantage that in some cases the melt will not become transparent, so that the reproducibility of the measurement is low owing to individual errors. Nevertheless, the eutectic temperatures given in the basic tests are usually reproducible to within ±5 °C.

It should be noted that during eutectic temperature determination the beginning of the process of melting is observed, whereas during melting-point determination it is the end of the process that is surveyed.

Mixed melting point

Procedure

The determination of a mixed melting point is carried out in a glass capillary as described under "Determination of melting point", page 6. Equal amounts of the substance to be tested and the authentic substance are mixed and placed in a capillary. A separate capillary is filled with the substance to be tested and a further capillary with the authentic substance. All three capillaries are simultaneously heated in the melting-point apparatus. The melting point of the mixture should not differ by more than ± 4 °C from the melting points of the single substances.

Discussion

Although mixed melting-point determinations are not included in the basic tests, this procedure is a highly reliable criterion in deciding whether two substances are identical. The general introduction of mixed melting-point determination as an identity test would require a wide accessibility of appropriate reference substances, which can sometimes only be arranged on a national basis. Each laboratory can, however, gradually create for itself a collection of authentic substances from incoming consignments of materials of good quality and can then use the mixed melting point as a strong additional criterion of identity. Such a collection, once established, may further be used in identity tests using the thin-layer chromatography technique.

Melting-point apparatus

Type of apparatus

A number of types of melting-point apparatus are produced. A review of those that are commercially available is given by Büchi & Hasler.[a]

The apparatus employed in the determination should be equipped with a magnifying glass, have a controlled heating arrangement that permits a heating rate of 1–2 °C/min around the temperature of melting, and be equipped to be used with capillaries of 1-mm inner diameter.

The heating arrangement can take the form of a stirred bath, such as the Thiele apparatus and its modifications,[b] or a heated block, e.g., the Lindström or Culatti modifications.[c]

Calibration of thermometers

For the various measurements of melting characteristics to be of any value, it is essential to use accurate thermometers. The thermometer used should preferably be certified by a duly recognized body. Alternatively, it could be calibrated against such a thermometer. Another method of checking the accuracy of the thermometer is by measuring the melting points of a set of WHO melting-point reference substances using a 1-mm capillary; if the observed melting points of the reference substances lie within ±2 °C of the melting temperature indicated for that substance, the thermometer may be considered satisfactory. An important requisite, however, is that the geometrical arrangement of the thermometer and capillaries in the apparatus is practically identical in every determination. The length of the column of mercury in the thermometer exposed to room temperature can introduce significant error particularly at high temperature. It is therefore desirable to use thermometers with narrow ranges of temperature

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[a] Büchi, J. & Hasler, C. *Pharmaceutica acta Helvetiae*, 49: 47 (1974).
[b] Skan, E.L. & Arthur, J.C. Jr. In: Weissberger, A., ed. *Technique of organic chemistry*, New York, Interscience, 1971, Vol. 1, p. 105.
[c] Kienitz, H. In: Houben-Weyl, *Methoden der organischen Chemie*, Stuttgart, Georg Thieme Verlag, 1953, Vol. 2, p. 788.

such as 0–110 °C, 110–210 °C or 200–300 °C. If this is not possible, a correction factor should be introduced according to the formula given in *The International Pharmacopoeia*, third edition (volume 1, page 22).

Heating behaviour

The expression "heating behaviour" used in the basic tests denotes the behaviour of the substance (such as colour changes or evolution of gas) when heated in an open test-tube in a flame or in an electrical heater.

5. Test procedures

ACETAZOLAMIDE TABLETS

Description. Each tablet usually contains 250 mg of acetazolamide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 30 mg and 40 mg of acetazolamide.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 30 mg for test substance 1; 40 mg for test substance 2.

Identity tests

Colour and other reactions

1. Transfer test substance 1 to a test-tube, add 2.0 ml of hydrochloric acid (~70 g/l) TS and 0.05 g of zinc R powder; an odour of hydrogen sulfide is perceptible. Place a strip of lead acetate paper R or lead nitrate paper R above the tube; the colour of the paper turns brown-black.

2. To test substance 2, add 5 ml of water and about 0.1 ml of sodium hydroxide (~ 80 g/l)TS and shake.Then add about 0.1 ml of copper(II) sulfate(160 g/l) TS; a blue-green precipitate is produced.

ACETYLSALICYLIC ACID TABLETS

Description. Each tablet usually contains 100–500 mg of acetylsalicylic acid.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 20 mg of acetylsalicylic acid.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance.

Identity tests

Heating behaviour. Heat a small quantity of the test substance in a test-tube; the melt has a strong odour of acetic acid. On further heating, the colour of the melt changes from yellow to brown and then to black.

Colour and other reactions

1. Transfer half of the test substance remaining after the heating test to a suitable white test plate or a watch-glass placed on a white background and add 1 drop of ferric chloride (25 g/l) TS; no violet colour is produced.

2. Place half of the test substance remaining after the heating test on a suitable white test plate or a watch-glass placed on a white background and add 1 drop of potassium hydroxide/ethanol TS. After 1 minute add 1 drop of ferric chloride (25 g/l) TS; a violet colour is produced.

ALUMINIUM HYDROXIDE TABLETS

Description. Each tablet usually contains 500 mg of aluminium hydroxide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 0.15 g and 0.7 g of aluminium hydroxide.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.15 g for test substance 1; 0.7 g for test substance 2.

Identity tests

Colour and other reactions

1. To test substance 1 add 5 ml of sodium hydroxide (~80 g/l) TS, heat to boiling and filter. To the filtrate add 0.5 g of ammonium chloride R and shake; a white, gelatinous precipitate is produced gradually.

2. Shake test substance 2 with 10 ml of freshly boiled and cooled water for 1 minute and filter; the filtrate is neutral when tested with pH-indicator paper R.

AMILORIDE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 5 mg of amiloride hydrochloride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.07 g of amiloride hydrochloride.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 50 ml of boiling water, filter while hot and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 15 ml of the test solution add 2.0 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of sodium nitrite (10 g/l) TS, and shake for 2–3 minutes. Then add 0.5 ml of 2-naphthol TS; a reddish brown precipitate is produced.

2. To 15 ml of the test solution add 0.5 ml of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white precipitate is formed. Add a few drops of ammonia (~100 g/l) TS; the precipitate dissolves.

AMINOCAPROIC ACID INJECTION

Description. The injection is a sterile solution usually containing 200–400 mg of aminocaproic acid in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the ampoules equivalent to 0.5 g of aminocaproic acid and use directly as the test solution.

2. Place 3 strips of filter-paper into the test solution and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers).

Identity tests

Colour and other reactions

1. On to one test paper place 1 drop of copper(II) sulfate (160 g/l) TS; a blue-green spot is produced.

2. On to one test paper place 1 drop of triketohydrindene/ethanol TS and allow to react for a few minutes at room temperature; a purple spot is produced.

3. On to one test paper place 1 drop of ferric chloride (25 g/l) TS; an orange-red spot is produced.

AMINOCAPROIC ACID TABLETS

Description. Each tablet usually contains 500 mg of aminocaproic acid.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.5 g of aminocaproic acid.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and suspend it in 5 ml of water. Place 3 strips of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers).

Identity tests

Colour and other reactions

1. On to one test paper place 1 drop of copper(II) sulfate (160 g/l) TS; a blue-green spot is produced.

2. On to one test paper place 1 drop of triketohydrindene/ethanol TS and allow to react for a few minutes at room temperature; a purple spot is produced.

3. On to one test paper place 1 drop of ferric chloride (25 g/l) TS; an orange-red spot is produced.

AMINOPHYLLINE INJECTION

Description. The injection is a sterile solution usually containing 25 mg of aminophylline in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 0.25 g of aminophylline and use directly as the test solution.

Identity tests

Colour and other reactions

1. To the test solution add 6 ml of water and, drop by drop while shaking, about 4 ml of hydrochloric acid (~70 g/l) TS until acidic. Collect the precipitate on a filter, wash it with water and dry at 105 °C for 1 hour; melting behaviour, about 270 °C (keep the residue for test 2 and the filtrate for test 3).

2. Place 10 mg of the residue obtained in test 1 in a porcelain dish and add 1.0 ml of hydrochloric acid (~250 g/l) TS and about 0.5 ml of hydrogen peroxide (~330 g/l) TS. Evaporate to dryness on a water-bath. To the dried orange-coloured residue add 1 drop of ammonia (~100 g/l) TS; the colour changes to purple and it is destroyed by the addition of a few drops of sodium hydroxide (~80 g/l) TS.

3. To the filtrate obtained in test 1 add 0.5 ml of sodium hydroxide (~80 g/l) TS and 0.25 ml of copper(II) acetate (45 g/l) TS; a blue colour is produced. Add 0.5 ml of potassio-mercuric iodide TS; a white precipitate is produced which rapidly changes to a violet colour.

AMINOPHYLLINE TABLETS

Description. Each tablet usually contains 100–200 mg of aminophylline.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.5 g of aminophylline.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 25 ml of water and filter. To the filtrate add 1.0 ml of hydrochloric acid (~70 g/l) TS, stir and chill if necessary to precipitate theophylline. Filter and retain the filtrate, free from washings, to be used as the test solution. Wash the precipitate on the filter with ice-water, dry it at 105 °C for 1 hour and use the dried material as the test substance.

Identity tests

Colour and other reactions

1. Place 10 mg of the test substance in a porcelain dish and add 1.0 ml of hydrochloric acid (~250 g/l) TS and about 0.5 ml of hydrogen peroxide (~330 g/l) TS. Evaporate to dryness on a water-bath. Add 1 drop of ammonia (~100 g/l) TS to the residue; a purple colour is produced which is destroyed by the addition of a few drops of sodium hydroxide (~80 g/l) TS.

2. Prepare a saturated solution with a portion of the test substance in water and add a few drops of tannic acid (100 g/l) TS; a precipitate is produced which is soluble in an excess of the reagent.

3. To 5 ml of the test solution add 0.5 ml of sodium hydroxide (~80 g/l) TS and 5 drops of copper(II) acetate (45 g/l) TS; a violet colour is produced. Add 0.5 ml of potassio-mercuric iodide TS; a white precipitate is produced which rapidly changes to a violet colour.

AMITRIPTYLINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 25 mg of amitriptyline hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1

tablet or core and calculate the amounts equivalent to 5 mg and 0.20 g of amitriptyline hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: 5 mg for test substance 1; 0.20 g for test substance 2.

3. Shake test substance 2 with 10 ml of ethanol (~750 g/l) TS, filter, evaporate the filtrate and dry at 105 °C; divide the residue into 2 parts and use as test substance 3.

Identity tests

Colour and other reactions

1. To test substance 1 add about 3 ml of sulfuric acid (~1760 g/l) TS; an orange-red colour is produced. Add a few drops of potassium dichromate (100 g/l) TS; the colour turns to dark brown.

2. Shake 1 part of test substance 3 with 10 ml of sulfuric acid (~100 g/l) TS and add 2.0 ml of a saturated solution of potassium permanganate R; the violet colour of the solution disappears quickly. Heat the mixture on a water-bath until the formed brown precipitate is almost dissolved. Allow to cool. To the supernatant liquid add 5 ml of ammonia (~260 g/l) TS and shake for 2 minutes. Add 3 ml of chloroform R and shake again; a violet-red colour is produced in the chloroform layer.

3. To 1 part of test substance 3 add 2.0 ml of water and 1.0 ml of nitric acid (~130 g/l) TS; a white precipitate which may appear dissolves on stirring. Check the solution with pH-indicator paper R to ensure that it is acidic and add 2.0 ml of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

AMPICILLIN CAPSULES

Description. Each capsule contains ampicillin or ampicillin trihydrate usually equivalent to 250–500 mg of anhydrous ampicillin.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amounts equivalent to 30 mg and 0.10 g of anhydrous ampicillin.

2. Empty the capsules, weigh out the above-calculated equivalent amounts and use directly: 30 mg for test substance 1, divided into 3 equal parts; 0.10 g for test substance 2.

3. Suspend test substance 2 in 5 ml of ethanol (~750 g/l) TS. Place 2 strips of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the

part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers).

Identity tests

Colour and other reactions

1. Shake 1 part of test substance 1 with 3 ml of water and filter. To the filtrate add 0.10 g of hydroxylamine hydrochloride R and about 0.4 ml of sodium hydroxide (~80 g/l) TS and allow to stand for 5 minutes. Then add 1.3 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red to violet-brown colour is produced.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of hydroxylamine hydrochloride (10 g/l) TS, followed by 1 drop of sodium hydroxide (~80 g/l) TS and allow to react for 5 minutes. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; a violet-red ring is produced.

2. Shake 1 part of test substance 1 with 1.0 ml of water and filter. To the filtrate add 1.0 ml of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a red-violet colour is produced which turns green on standing.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a light violet spot is produced.

3. Dissolve 10 mg of triketohydrindene hydrate R in 10 ml of ethanol (~750 g/l) TS, place 0.1 ml on a strip of filter-paper and dry at 105 °C. Superimpose on the spot about 0.1 ml of a suspension of 1 part of test substance 1 in 10 ml of water, heat at 105 °C for 5 minutes and allow to cool; a violet colour is obtained.

AMPICILLIN POWDER FOR ORAL SUSPENSION

Description. The reconstituted suspension usually contains 25 mg of anhydrous ampicillin in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amounts equivalent to 30 mg and 0.10 g of anhydrous ampicillin.

2. Empty the vials, weigh out the above-calculated equivalent amounts and use directly: 30 mg for test substance 1, divided into 3 equal parts; 0.10 g for test substance 2.

3. Suspend test substance 2 in 5 ml of ethanol (~750 g/l) TS. Place 2 strips of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers).

Identity tests

Colour and other reactions

1. Shake 1 part of test substance 1 with 3 ml of water and filter. To the filtrate add 0.10 g of hydroxylamine hydrochloride R, about 0.4 ml of sodium hydroxide (~80 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red to violet-brown colour is produced.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of hydroxylamine hydrochloride (10 g/l) TS, followed by 1 drop of sodium hydroxide (~80 g/l) TS and allow to react for 5 minutes. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; a violet-red ring is produced.

2. Shake 1 part of test substance 1 with 1.0 ml of water and filter. To the filtrate add 1.0 ml of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a red-violet colour is produced which turns green on standing.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a light violet spot is produced.

3. Dissolve 10 mg of triketohydrindene hydrate R in 10 ml of ethanol (~750 g/l) TS, place 0.1 ml on a strip of filter-paper and dry at 105 °C. Superimpose on the spot about 0.1 ml of a suspension of 1 part of test substance 1 in 10 ml of water, heat at 105 °C for 5 minutes and allow to cool; a violet colour is obtained.

AMPICILLIN SODIUM POWDER FOR INJECTION

Description. Each vial contains a sterile powder of ampicillin sodium usually equivalent to 500 mg of anhydrous ampicillin.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amounts equivalent to 0.05 g and 0.10 g of ampicillin sodium.

2. Empty the vials, weigh out the above-calculated equivalent amounts and use directly: 0.05 g for test substance 1, divided into 5 equal parts; 0.10 g for test substance 2.

3. Suspend test substance 2 in 5 ml of ethanol (~750 g/l) TS. Place 2 strips of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers).

Identity tests

Colour and other reactions

1. Dissolve half of 1 part of test substance 1 in 3 ml of water, add 0.10 g of hydroxylamine hydrochloride R and 1.0 ml of sodium hydroxide (~80 g/l) TS and allow to stand for 5 minutes. Then add 1.0 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red to violet-brown colour is produced.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of hydroxylamine hydrochloride (10 g/l) TS, followed by 1 drop of sodium hydroxide (~80 g/l) TS, and allow to react for 5 minutes. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; a violet-red ring is produced.

2. Dissolve 1 part of test substance 1 in 1.0 ml of water and add 1.0 ml of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a red-violet colour is produced which turns green on standing.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a light violet spot is produced.

3. Dissolve 10 mg of triketohydrindene hydrate R in 10 ml of ethanol (~750 g/l) TS, place 0.1 ml on a strip of filter-paper and dry at 105 °C. Superimpose on the spot 0.1 ml of a solution of 1 part of test substance 1 in 10 ml of water, heat at 105 °C for 5 minutes and allow to cool; a violet spot is obtained.

4. Dissolve 2 parts of test substance 1 in 2.0 ml of water, acidify with 3-4 drops of glacial acetic acid R, filter and add 1.0 ml of magnesium uranyl acetate TS or zinc uranyl acetate TS to the filtrate. Scratch the inside of the tube with a glass rod to induce crystallization; a yellow, crystalline precipitate is produced.

ASCORBIC ACID TABLETS

Description. Each tablet usually contains 50 mg of ascorbic acid.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.30 g of ascorbic acid.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 6 equal parts.

3. Shake 4 parts of the test substance with 20 ml of water, filter and use the filtrate as the test solution.

4. Suspend 1 part of the test substance in 10 ml of ethanol (~750 g/l) TS. Place 3 strips of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers).

Identity tests

Heating behaviour. Heat a small quantity of the test substance in a test-tube; it melts, acquires a brown colour and has an odour resembling caramel. Ignite the melt; it swells and burns.

Colour and other reactions

1. To 2.0 ml of the test solution add 1.0 g of sodium hydrogen carbonate R and 20 mg of ferrous sulfate R; a violet colour is produced. Add 2.0 ml of hydrochloric acid (~70 g/l) TS; the colour disappears.

   Alternative test by filter-paper technique:
   On a test paper place 1 small drop of sodium hydrogen carbonate (40 g/l) TS, followed by 1 drop of ferrous sulfate (15 g/l) TS; a violet spot is produced. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS; the spot disappears.

2. To 2.0 ml of the test solution add 0.5 ml of potassium permanganate (10 g/l) TS; the initial violet colour is immediately discharged but a slight brown precipitate may appear.

   Alternative test by filter-paper technique:
   On a test paper place 1 drop of potassium permanganate (10 g/l) TS; the violet colour is discharged but a brown spot appears.

3. To 2.0 ml of the test solution add 2–3 drops of silver nitrate (40 g/l) TS; a dark grey precipitate is produced.

Alternative test by filter-paper technique:
On a test paper place 1 drop of silver nitrate (40 g/l) TS; a dark grey spot is produced.

ATROPINE SULFATE INJECTION

Description. The injection is a sterile solution usually containing 0.5–1.0 mg of atropine sulfate in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 20 mg of atropine sulfate. If necessary, reduce the volume to about 25 ml on a water-bath or dilute it to 25 ml with water and use directly as the test solution, dividing it into 2 equal volumes.

Identity tests

Colour and other reactions

1. Evaporate 1 volume of the test solution to dryness on a water-bath. To the cooled, white residue add 5 ml of dehydrated ethanol R, shake and filter. Evaporate the filtrate to dryness on a water-bath, add 3 drops of nitric acid (~1000 g/l) TS to the residue and again evaporate to dryness. Cool the residue and add 4 drops of potassium hydroxide/ethanol TS; a brownish violet colour is produced, which slowly disappears and a yellow residue remains.

2. To 1 volume of the test solution add a few drops of hydrochloric acid (~70 g/l) TS and a few drops of barium chloride (50 g/l) TS; a white precipitate is produced.

AZATHIOPRINE TABLETS

Description. Each tablet usually contains 50 mg of azathioprine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.075 g of azathioprine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. Heat 1 part of the test substance with 100 ml of water and filter. To 5 ml of the filtrate add 1 ml of hydrochloric acid (~250 g/l) TS and 10 mg of zinc R

powder and allow to stand for 5 minutes; the solution becomes yellow. Filter, cool in ice and add a few drops of sodium nitrite (10 g/l) TS and a few drops of sulfamic acid (100 g/l) TS. Shake until the bubbles disappear. Add 1.0 ml of 2-naphthol TS; a pale pink precipitate is produced.

2. Fuse 2 parts of the test substance with 0.05 g of potassium nitrate R and 0.1 g of potassium hydroxide R. Cool, dissolve the residue in 20 ml of water and filter. To 5 ml of the filtrate add 1.5 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of barium chloride (50 g/l) TS; a white turbidity is produced.

BENZYL BENZOATE LOTION

Description. The lotion usually contains 250 mg of benzyl benzoate suspended or dispersed in 1.0 ml of a suitable vehicle.

Preparation of the sample. Dissolve a volume of the lotion equivalent to 2.5 g of benzyl benzoate in 25 ml of ethanol (~750 g/l) TS and filter. Add 10 ml of sodium hydroxide (~80 g/l) TS and evaporate the ethanol on a water-bath. Cool the solution and shake it with 15 ml of ethyl acetate R. Keep the aqueous layer as the test solution. Wash the ethyl acetate layer with 10 ml of sodium hydroxide (~80 g/l) TS, filter and evaporate to a low volume on a water-bath. Use the oily colourless liquid as the test liquid.

Identity tests

Heating behaviour. Heat cautiously a few drops of the test liquid; it smokes, bursts into flame and burns with a rather sooty flame.

Colour and other reactions

1. To 1 or 2 drops of the test liquid add 5 ml of sodium carbonate (50 g/l) TS and 5 drops of potassium permanganate (10 g/l) TS; an odour of benzaldehyde is perceptible.

2. Neutralize the test solution with hydrochloric acid (~70 g/l) TS and add 1.0 ml of ferric chloride (25 g/l) TS; a reddish brown precipitate is formed. Shake the precipitous mixture with 10 ml of hydrochloric acid (~70 g/l) TS; a voluminous white precipitate is formed.

BENZYLPENICILLIN POTASSIUM POWDER FOR INJECTION

Description. Each vial contains a sterile powder usually equivalent to 0.6–3.0 g (1–5 million IU) of benzylpenicillin potassium.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amounts equivalent to about 5 mg, 0.04 g and 0.10 g of benzylpenicillin potassium.

2. Empty the vials, weigh out the above-calculated equivalent amounts and use directly: about 5 mg for test substance 1; 0.04 g for test substance 2, divided into 4 equal parts; 0.10 g for test substance 3.

3. Suspend test substance 3 in 5 ml of ethanol (~750 g/l)TS, place a strip of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Colour and other reactions

1. Dissolve 1 part of test substance 2 in 3 ml of water, add 0.10 g of hydroxylamine hydrochloride R and 1.0 ml of sodium hydroxide (~80 g/l)TS, and allow to stand for 5 minutes. Then add 1.3 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red colour is produced.

   Alternative test by filter-paper technique:
   On the test paper place 1 drop of hydroxylamine hydrochloride (10 g/l TS), followed by 1 drop of sodium hydroxide (~80 g/l) TS and allow to react for 5 minutes. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; a violet-red ring is produced.

2. Dissolve 1 part of test substance 2 in a few drops of ethanol (~750 g/l) TS and add 1.0 ml of water and 2 drops of ferric chloride (25 g/l) TS; a yellowish precipitate is produced.

3. To 10 mg of paraformaldehyde R dissolved in about 1 ml of sulfuric acid (~1760 g/l) TS add a few crystals of test substance 1; a colourless solution is produced. Heat the solution in a water-bath for 2 minutes and cool; the colour changes to brown-red.

4. Dissolve 2 parts of test substance 2 in 2.0 ml of water, acidify with 2–4 drops of glacial acetic acid R and add 1.0 ml of sodium cobaltinitrite (100 g/l) TS; an orange-yellow precipitate is produced.

BENZYLPENICILLIN POTASSIUM TABLETS

Description. Each tablet contains benzylpenicillin potassium usually equivalent to 60–500 mg (100 000–800 000 IU) of benzylpenicillin.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 40 mg, about 1 mg and 0.10 g of benzylpenicillin.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 40 mg for test substance 1, divided into 4 equal parts; about 1 mg for test substance 2: and 0.10 g for test substance 3.

3. Suspend test substance 3 in 5 ml of ethanol (~750 g/l) TS. Place a strip of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 3 ml of water, shake and filter. To the filtrate add 0.10 g of hydroxylamine hydrochloride R and 1.0 ml of sodium hydroxide (~80 g/l) TS and allow to stand for 5 minutes. Then add 1.3 ml of hydrochloric acid (~70 g/l) TS and about 0.5 ml of ferric chloride (25 g/l) TS; a violet-red colour is produced.

   Alternative test by filter-paper technique:
   On the test paper place 1 drop of hydroxylamine hydrochloride (10 g/l) TS, followed by 1 drop of sodium hydroxide (~80 g/l) TS and allow to react for 5 minutes. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; a violet-red ring is produced.

2. To 1 part of test substance 1 add a few drops of ethanol (~750 g/l) TS and 1.0 ml of water, shake and filter. To the filtrate add 1–2 drops of ferric chloride (25 g/l) TS; a yellowish precipitate is produced.

3. To 10 mg of paraformaldehyde R dissolved in about 1 ml of sulfuric acid (~1760 g/l) TS, add test substance 2; a colourless solution is produced. Heat the solution in a water-bath for 2 minutes and cool; the colour changes to yellow-brown.

4. To 2 parts of test substance 1 add 2.0 ml of water, shake and filter. To the filtrate add 2–3 drops of glacial acetic acid R and 1.0 ml of sodium cobaltinitrite (100 g/l) TS; an orange-yellow precipitate is produced.

BENZYLPENICILLIN SODIUM POWDER FOR INJECTION

Description. Each vial contains a sterile powder usually equivalent to 0.6–3.0 g (1–5 million IU) of benzylpenicillin sodium.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amounts equivalent to about 25 mg, 0.04 g and 0.10 g of benzylpenicillin sodium.

2. Empty the vials, weigh out the above-calculated equivalent amounts and use directly: 25 mg for test substance 1, divided into 5 equal parts; 0.04 g for test substance 2; 0.10 g for test substance 3.

3. Suspend test substance 3 in 5 ml of ethanol (~750 g/l) TS, place a strip of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Melting behaviour. A few crystals of the test substance melt at about 228 °C with decomposition (turning black).

Colour and other reactions

1. Dissolve 2 parts of test substance 1 in 3 ml of water, add 0.10 g of hydroxylamine hydrochloride R and about 0.4 ml of sodium hydroxide (~80 g/l) TS and allow to stand for 5 minutes. Then add 1.3 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red colour is produced.

   Alternative test by filter-paper technique:
   On the test paper place 1 drop of hydroxylamine hydrochloride (10 g/l) TS, followed by 1 drop of sodium hydroxide (~80 g/l) TS and allow to react for 5 minutes. Then apply, at the same place on the test paper, 1 drop of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; a violet-red ring is produced.

2. Dissolve 2 parts of test substance 1 in a few drops of ethanol (~750 g/l) TS and add 1.0 ml of water and 2 drops of ferric chloride (25 g/l) TS; a yellowish precipitate is produced.

3. To 10 mg of paraformaldehyde R dissolved in about 1 ml of sulfuric acid (~1760 g/l) TS add a few crystals of test substance 1; a light yellow colour is produced. Heat the solution in a water-bath for 2 minutes and cool; the colour changes to brown-red.

4. Dissolve test substance 2 in 2.0 ml of water, acidify with 2–4 drops of glacial acetic acid R, filter and to the filtrate add 1.0 ml of magnesium uranyl acetate TS or zinc uranyl acetate TS. Scratch the inside of the tube with a glass rod to induce crystallization; a yellow, crystalline precipitate is produced.

BETAMETHASONE TABLETS

Description. Each tablet usually contains 250–600 mg of betamethasone.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 30 mg of betamethasone.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of chloroform R, filter, evaporate the filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. To 5 mg of the test substance add 1 drop of formaldehyde/sulfuric acid TS; an orange colour is produced. Heat on a water-bath for 1 minute; the colour changes to brown.

2. Dissolve 5 mg of the test substance in 0.5 ml of methanol R, add 1.0 ml of hot potassio-cupric tartrate TS, warm the solution on a water-bath, allow to cool and filter. Wash the filter with water; a red precipitate remains on the filter.

3. Mix about 0.15 ml of potassium dichromate (100 g/l) TS with about 0.5 ml of sulfuric acid (~1760 g/l) TS and heat in a water-bath for 5 minutes; the solution wets the sides of the tube. Add 15 mg of the test substance, shake well and heat again in a water-bath for 5 minutes; a violet-black colour is obtained and the solution no longer wets the sides of the tube.

BETAMETHASONE VALERATE CREAM

Description. The cream usually contains 1.2 mg of betamethasone valerate in 1 g of a suitable base, equivalent to 1.0 mg of betamethasone per gram.

Preparation of the sample. Withdraw an amount equivalent to 10 mg of betamethasone valerate, add 30 ml of methanol R and 20 ml of cyclohexane R and shake well. Separate the upper methanol layer and wash it with two 10-ml portions of cyclohexane R. Filter the methanol layer, evaporate the filtrate on a water-bath to a volume of 10 ml and use as the test solution.

Identity tests

Colour and other reactions

1. Evaporate 2–3 drops of the test solution to dryness from a porcelain dish on a water-bath and add 1 drop of formaldehyde/sulfuric acid TS; an orange colour is produced. Heat on a water-bath for 1 minute; the colour changes to brown.

2. Add 0.5 ml of hot potassio-cupric tartrate TS to 2.0 ml of the yellow-coloured test solution; the solution turns blue. Warm the solution for 10–15

minutes; the colour changes gradually to green and a reddish-brown precipitate is produced.

3. Mix about 0.15 ml of potassium dichromate (100 g/l) TS with about 0.5 ml of sulfuric acid (~1760 g/l) TS and heat in a water-bath for 5 minutes; the solution wets the sides of the tube. Cool and add carefully, drop by drop, 3 ml of the test solution. Shake well and heat on an open flame for 15 minutes; the colour changes to dirty dark green with a violet-black tinge and the solution no longer wets the sides of the tube.

BETAMETHASONE VALERATE OINTMENT

Description. The ointment contains betamethasone valerate usually equivalent to 1 mg of betamethasone in 1.0 g of a suitable ointment base.

Preparation of the sample. Withdraw an amount equivalent to 10 mg of betamethasone valerate, add 30 ml of methanol R and 20 ml of cyclohexane R and shake well. Separate the upper methanol layer and wash it with two 10-ml portions of cyclohexane R. Filter the methanol layer, evaporate the filtrate on a water-bath to a volume of 10 ml and use as the test solution.

Identity tests

Colour and other reactions

1. Evaporate 2–3 drops of the test solution to dryness from a porcelain dish on a water-bath and add 1 drop of formaldehyde/sulfuric acid TS; an orange colour is produced. Heat on a water-bath for 1 minute; the colour changes to brown.

2. Add 0.5 ml of hot potassio-cupric tartrate TS to 2.0 ml of the yellow-coloured test solution; the test solution turns blue. Warm the solution for 10–15 minutes; the colour changes gradually to green and a reddish-brown precipitate is produced.

3. Mix about 0.15 ml of potassium dichromate (100 g/l) TS with about 0.5 ml of sulfuric acid (~1760 g/l) TS and heat in a water-bath for 5 minutes; the solution wets the sides of the tube. Cool and add carefully, drop by drop, 3 ml of the test solution. Shake well and heat on an open flame for 15 minutes; the colour changes to dirty dark green with a violet-black tinge and the solution no longer wets the sides of the tube.

BUPIVACAINE HYDROCHLORIDE INJECTION

Description. The injection is a sterile solution usually containing 2.5–5.0 mg of bupivacaine hydrochloride in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 20 mg of bupivacaine hydrochloride and use directly as the test solution, dividing it into 4 equal volumes.

Identity tests

Colour and other reactions

1. To 1 volume of the test solution add 1.0 ml of pyridine R, 0.5 ml of sodium hydroxide (~80 g/l) TS and 5 drops of benzenesulfonyl chloride R; a cherry red colour is produced.

2. Evaporate 1 volume of the test solution to dryness on a water-bath. To the residue add a mixture of 1.0 ml of sulfuric acid (~1760 g/l) TS and 2 drops of formaldehyde TS, and warm on a water-bath for 1 minute; a reddish-brown to red colour is produced.

3. To 1 volume of the test solution add about 0.5 ml of sulfuric acid (~1760 g/l) TS, boil for 1 minute, cool and add 0.5 ml of sodium nitrite (10 g/l) TS. Allow to stand for 1 minute, then add 2.5 ml of sodium hydroxide (~80 g/l) TS and 1–2 drops of 2-naphthol TS; an orange to red colour is produced.

4. To 1 volume of the test solution add 0.5 ml of nitric acid (~130 g/l) TS and 5 drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced, which is soluble in an excess of ammonia (~100 g/l) TS.

BUSULFAN TABLETS

Description. Each tablet usually contains 2.0 mg of busulfan. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 60 mg of busulfan.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, shake it with 30 ml of acetone R, filter, evaporate the filtrate to dryness on a water-bath, crystallize from a small volume of acetone R, separate the crystals, dry them at 80 °C for 2 hours and use as the test substance.

Identity tests

Melting point. The test substance melts at about 117 °C.

Colour and other reactions

1. Fuse 30 mg of the test substance with 25 mg of potassium nitrate R and 0.05 g of potassium hydroxide R. Cool, dissolve the residue in 10 ml of water

and filter. To 5 ml of the filtrate add 1.0 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

2. Dissolve 20 mg of the test substance in 5 ml of water and add 1.5 ml of sodium hydroxide (~80 g/l) TS. Heat until a clear solution is obtained; a characteristic, pungent odour is perceptible. Cool the solution and divide it into 2 portions: (a) To 1 portion add 2–3 drops of potassium permanganate (10 g/l) TS; the purple colour changes to violet then to blue and finally to emerald green. (b) Acidify 1 portion with a few drops of sulfuric acid (~100 g/l) TS, add 2–3 drops of potassium permanganate (10 g/l) TS and shake; the purple colour of the permanganate is not discharged.

CARBAMAZEPINE TABLETS

Description. Each tablet usually contains 100–200 mg of carbamazepine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of carbamazepine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of warm acetone R, filter while still warm, evaporate the filtrate to dryness on a water-bath and dry at 80 °C. Use the residue as the test substance.

Identity tests

Melting point. The test substance melts at about 189 °C.

Colour and other reactions

1. To 5 mg of the test substance add 1 ml of formaldehyde/sulfuric acid TS; a yellow colour is gradually produced which turns orange on standing.

2. To 10 mg of the test substance add about 2 ml of nitric acid (~1000 g/l) TS and heat in a water-bath for 1 minute; an orange colour is produced.

CHARCOAL, ACTIVATED, TABLETS

Description. Each tablet usually contains 100–350 mg of activated charcoal.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 1.5 g of activated charcoal.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance.

Identity tests

Colour and other reactions

1. Heat a small quantity of the test substance to redness; it burns slowly without a flame.

2. Shake the remaining test substance with 30 ml of methylthioninium chloride (1 g/l) TS or thionine (1 g/l) TS for 5 minutes and filter; a colourless solution is produced.
   Note. Some pharmaceutical aids, e.g., carmellose, present in the formulation form a more or less gelatinous solution after shaking, and may cause difficulties with filtering. Separate by centrifugation or use a sintered glass filter; observe only the first few ml of the filtrate.

CHLORAMBUCIL TABLETS

Description. Each tablet usually contains 2.0 mg of chlorambucil. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.05 g of chlorambucil.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, shake it with 20 ml of chloroform R, filter and evaporate the filtrate to dryness on a water-bath. Use the residue as the test substance.

Identity tests

Colour and other reactions

1. Dissolve 10 mg of the test substance in a mixture of 1.0 ml of acetone R and 1.0 ml of water. Add 1 drop of sulfuric acid (~1760 g/l) TS and a few drops of silver nitrate (40 g/l) TS; no opalescence is immediately observed. Warm the solution on a water-bath for 2-3 minutes; an opalescence is obtained.

2. To 30 mg of the test substance add 3.0 ml of hydrochloric acid (~70 g/l) TS, mix and allow to stand for 30 minutes, shaking occasionally. Filter, wash the residue with 5 ml of water (keep the filtrate for tests 3 and 4) and dry the residue at 105 °C for 3 hours; melting point, about 146 °C.

3. To 5 ml of the filtrate from test 2 add 0.5 ml of potassio-mercuric iodide TS; a light beige coloured precipitate is produced.

4. To the remaining filtrate from test 2 add 3 drops of potassium permanganate (10 g/l) TS; the colour is discharged.

CHLORAMPHENICOL CAPSULES

Description. Each capsule usually contains 250 mg of chloramphenicol.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 45 mg of chloramphenicol.

2. Empty the capsules, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. To 2 parts of the test substance add 10 ml of water, 2.0 ml of sulfuric acid (~100 g/l) TS and 0.2 g of zinc R powder. Allow to stand for 10 minutes and filter. To 5 ml of the filtrate (keep the remaining filtrate for test 2) add a few drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

2. To the filtrate from test 1 add 1–2 drops of sodium nitrite (10 g/l) TS. After a few minutes add 1.0 g of urea R and a solution of 10 mg of 2-naphthol R dissolved in 2.0 ml of sodium hydroxide (~80 g/l) TS; a red colour is produced.

3. Add 1 part of the test substance to a mixture of 5 drops of liquefied phenol R and 0.20 g of potassium hydroxide R. Heat to boiling over a small flame and shake; a brown-red colour is produced. Add 2.0 ml of water; the colour turns to dark green.

CHLORAMPHENICOL PALMITATE ORAL SUSPENSION

Description. The suspension usually contains 2.6 g of chloramphenicol palmitate equivalent to about 1.5 g of chloramphenicol in 50 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the containers equivalent to about 2 g of chloramphenicol and use directly as the test solution, dividing it into 4 equal volumes.

Identity tests

Colour and other reactions

1. To 1 volume of the test solution add 10 ml of ethanol (~750 g/l) TS, shake to dissolve, and if necessary, heat gently. Add 0.2 g of zinc R powder and 2.0 ml of hydrochloric acid (~250 g/l) TS and allow to stand for 10 minutes. Filter and to the filtrate add 0.5 ml of sodium nitrite (10 g/l) TS and allow to

stand for 2 minutes. Then add 1.0 g of urea R and a solution containing 10 mg of 2-naphthol R in 2.0 ml of sodium hydroxide (~80 g/l) TS; an orange-red colour is produced.

2. Repeat test 1 but omitting the zinc R powder; no red colour is produced.

3. Dilute one-fourth of 1 volume of the test solution with 10 ml of water and filter, if necessary. Transfer the residue to a porcelain crucible, add 1 g of anhydrous sodium carbonate R and mix. Heat carefully over an open flame for 10 minutes, allow to cool and dissolve the residue in 10 ml of nitric acid (~130 g/l) TS. Filter, check for acidity of the filtrate (if needed, add more nitric acid) and add a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

4. Boil 5 drops of the test solution with 5 ml of sodium hydroxide (~80 g/l) TS; the mixture foams strongly and a dark yellow colour is produced.

CHLORAMPHENICOL SODIUM SUCCINATE POWDER FOR INJECTION

Description. Each vial contains a sterile powder of chloramphenicol sodium succinate usually equivalent to 1.0 g of chloramphenicol.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amount equivalent to 1.0 g of chloramphenicol.

2. Empty the vial, weigh out the above-calculated equivalent amount, dissolve it in 5 ml of water and use directly as the test solution.

Identity tests

Colour and other reactions

1. To 1 drop of the test solution add 5 ml of ethanol (~750 g/l) TS, 0.2 g of zinc R powder and 1.0 ml of sulfuric acid (~100 g/l) TS and allow to stand for 10 minutes. Filter, add 0.5 ml of sodium nitrite (10 g/l) TS to the filtrate and allow to stand for 2 minutes. Then add 1.0 g of urea R and a solution containing 10 mg of 2-naphthol R in 2 ml of sodium hydroxide (~80 g/l) TS; a red colour is produced.

2. Repeat test 1 but omitting the zinc R powder; no red colour is produced.

3. Heat carefully 1 drop of the test solution with 10 mg of resorcinol R and 3 drops of sulfuric acid (~1760 g/l) TS, cool and add 2 ml of water. Cool again and pour the solution into a mixture of 100 ml of water and 1 ml of sodium hydroxide (~400 g/l) TS; a yellow-green fluorescence appears, which disappears on the addition of 1.0 ml of hydrochloric acid (~250 g/l) TS.

4. Introduce the test solution into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a strong yellow colour is observed.

CHLOROQUINE PHOSPHATE SYRUP

Description. The syrup contains chloroquine phosphate usually equivalent to 10 mg of chloroquine in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the well-homogenized contents of the containers equivalent to 50 mg of chloroquine, and use directly as the test solution.

2. Transfer the test solution to a separating funnel and add 25 ml of water and 2.0 ml of ammonia (~100 g/l) TS. Extract twice with 25-ml volumes of chloroform R. Separate the chloroform layers, evaporate to reduce the volume to about 5 ml and use as test solution 1, dividing it into 2 equal volumes. Filter the aqueous layer through a filter-paper and use the filtrate as test solution 2.

Identity tests

Colour and other reactions

1. To 1 volume of test solution 1 add 2.0 ml of hydrochloric acid (~70 g/l) TS and 5 drops of potassio-mercuric iodide TS; a white or light yellow precipitate is produced.

2. Evaporate 1 volume of test solution 1 to dryness and fuse the residue with 1 pellet of potassium hydroxide R. Dissolve the fused mass in 2.0 ml of water, filter, acidify the filtrate with 1.0 ml of nitric acid (~130 g/l) TS and add 5 drops of silver nitrate (40 g/l) TS; an off-white, curdy precipitate is produced. Add an excess of ammonia (~100 g/l) TS; the precipitate dissolves.

3. To 2.0 ml of test solution 2 add 1.0 ml of silver nitrate (40 g/l) TS; a yellow precipitate is produced. To a portion of the precipitate add a few drops of nitric acid (~130 g/l) TS; a clear solution is obtained. To another portion of the precipitate add a few drops of ammonia (~100 g/l) TS and shake; the yellow precipitate dissolves but a small amount of white precipitate remains.

4. To 2.0 ml of test solution 2 add 1.0 ml of nitric acid (~130 g/l) TS and 1.0 ml of ammonium molybdate (95 g/l) TS; a yellow precipitate is obtained.

CHLOROQUINE PHOSPHATE TABLETS

Description. Each tablet contains chloroquine phosphate usually equivalent to 150–200 mg of chloroquine. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amounts equivalent to 5 mg, 0.05 g and 0.25 g of chloroquine.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: 5 mg for test substance 1; 0.05 g for test substance 2; 0.25 g for test substance 3.

3. Shake test substance 1 with 1.0 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. Transfer test substance 2 to a small test-tube and fuse it with 1 pellet of potassium hydroxide R for approximately 5 minutes. Drop the red-glowing tube into a conical flask containing 2.0 ml of water. Filter the mixture into another test-tube, acidify with 1.0 ml of nitric acid (~130 g/l) TS and add 5 drops of silver nitrate (40 g/l) TS; an off-white, curdy precipitate is produced. Add an excess of ammonia (~100 g/l) TS; the precipitate dissolves.

2. To the test solution add 1.0 ml of silver nitrate (40 g/l) TS; a yellow precipitate is produced. To a portion of the precipitate add a few drops of nitric acid (~130 g/l) TS; a clear solution is obtained. To another portion of the precipitate add a few drops of ammonia (~100 g/l) TS and shake; the yellow precipitate dissolves but a small amount of white precipitate remains.

3. Shake test substance 3 with 20 ml of water, filter and to the filtrate add 5 ml of a saturated solution of trinitrophenol R in water; a yellow precipitate is produced. Filter and wash the precipitate until the washing liquid becomes colourless. Collect the precipitate and dry in a desiccator over sulfuric acid (~1760 g/l) TS at room temperature; melting behaviour, about 207 °C.

CHLOROQUINE SULFATE TABLETS

Description. Each tablet contains chloroquine sulfate usually equivalent to 150–200 mg of chloroquine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 50 mg and 60 mg of chloroquine.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 50 mg for test substance 1; 60 mg for test substance 2, divided into 3 equal parts.

Identity tests

Colour and other reactions

1. Add test substance 1 to 5 ml of sulfuric acid (~1760 g/l) TS; the colour of the mixture remains unchanged. Add 3 drops of potassium dichromate (100 g/l) TS; a red colour is produced which quickly changes to red-brown.

2. Suspend 1 part of test substance 2 in 2.0 ml of water and add 5 drops of potassio-mercuric iodide TS; a faintly yellow, thick precipitate is produced.

3. Shake 1 part of test substance 2 with 20 ml of water and filter. To the filtrate add 8 ml of trinitrophenol (7 g/l) TS. Filter, wash the precipitate with water until the filtrate is almost colourless, and dry the precipitate over silica gel, desiccant, R; melting behaviour, about 207 °C.

4. Suspend 1 part of test substance 2 with 10 ml of water and 1.0 ml of hydrochloric acid (~70 g/l) TS and filter. To the filtrate add 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

CHLORPHENAMINE HYDROGEN MALEATE TABLETS

Description. Each tablet usually contains 4 mg of chlorphenamine hydrogen maleate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 5 mg, 10 mg and 40 mg of chlorphenamine hydrogen maleate.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 10 mg for test substance 1; 2 portions of 5 mg for test substance 2; 40 mg for test substance 3.

3. Shake test substance 1 with 3 ml of sodium nitrite (10 g/l) TS, filter and use the filtrate as test solution 1. Shake 1 portion of test substance 2 with 2.0 ml of water, filter and use the filtrate as test solution 2.

Identity tests

Colour and other reactions

1. Shake 1 portion of test substance 2 with 5 ml of chloroform R, filter and evaporate the filtrate on a water-bath. Dissolve the residue in 2.0 ml of water, add 3 drops of ferric chloride (25 g/l) TS and heat to boiling; a yellow-orange colour is produced.

2. Divide test solution 1 equally between two test-tubes. To one tube add 1.0 ml of sulfanilic acid TS. Heat both tubes to boiling; a yellow colour is

produced in the treated test solution, the untreated solution remains a very faint pale yellow colour.

3. To test solution 2 add 1 drop of potassium permanganate (10 g/l) TS; the purple colour is discharged.

4. Add about 20 ml of water to test substance 3, warm to dissolve it and filter. To the filtrate add 10 ml of a saturated solution of trinitrophenol R in water and warm on a water-bath for 5 minutes; a precipitate is produced. Filter, wash the precipitate with water, collect the precipitate and dry it at 105 °C for 1 hour; melting behaviour, about 196 °C with decomposition.

CHLORPROMAZINE HYDROCHLORIDE SYRUP

Description. The syrup usually contains 25 mg of chlorpromazine hydrochloride in 5 ml of a suitable vehicle.

Preparation of the sample

1. To a stoppered flask transfer a volume of well-homogenized syrup equivalent to 50 mg of chlorpromazine hydrochloride and add 10 g of anhydrous sodium sulfate R and 25 ml of chloroform R. Shake for 3 minutes, filter the chloroform layer and use the filtrate as the test solution.

2. Evaporate 15 ml of the test solution to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. To 1–2 mg of the test substance add a few drops of sulfuric acid (~1760 g/l) TS; a cherry red colour is produced which gradually changes to deep red (distinction from promazine).

2. To 5 ml of the test solution add 1.0 ml of sodium metaperiodate (60 g/l) TS and 1.0 ml of sulfuric acid (~100 g/l) TS. Shake vigorously and allow the layers to separate; the aqueous layer shows a red colour which fades slowly on standing and the chloroform layer acquires a pink colour (distinction from promethazine).

3. Dissolve 10 mg of the test substance in 5 ml of water and add about 2 ml of nitric acid (~1000 g/l) TS; a dark red colour is produced which suddenly fades to almost colourless. Add 2.0 ml of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

CHLORPROMAZINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 100 mg of chlorpromazine hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amounts equivalent to 0.10 g and 10 mg of chlorpromazine hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.10 g for test substance 1, divided into 2 parts; 10 mg for test substance 2.

3. Shake 1 part of test substance 1 with 5 ml of water, filter and use the filtrate as test solution 1. Shake test substance 2 with 5 ml of chloroform R, filter and use the filtrate as test solution 2.

Identity tests

Colour and other reactions

1. Shake 1 part of test substance 1 with 5 ml of chloroform R and filter. Evaporate 0.5 ml of the filtrate to dryness, add 2 ml of sulfuric acid (~1760 g/l) TS to the residue and allow to stand for 5 minutes; a rose-red colour is produced (distinction from promazine).

2. To test solution 2 add 1.0 ml of sodium metaperiodate (60 g/l) TS and 2.0 ml of sulfuric acid (~100 g/l) TS. Shake vigorously and allow the layers to separate; in the aqueous layer a vivid red colour is produced which fades slowly on standing and the chloroform layer acquires a pink colour (distinction from promethazine).

3. To 1.0 ml of test solution 1 add 4 ml of water and about 1.5 ml of sodium hydroxide (~80 g/l) TS, mix and filter. To the filtrate add 1.0 ml of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white precipitate is produced. Add 1.0 ml of ammonia (~100 g/l) TS; the precipitate dissolves.

CIMETIDINE TABLETS

Description. Each tablet usually contains 200 mg of cimetidine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 60 mg of cimetidine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. Ignite a small quantity of the test substance; the vapours evolved darken lead nitrate paper R.

2. To 1 part of the test substance add 10 ml of water, stir well and add a few drops of potassium iodobismuthate/acetic acid TS; an orange precipitate is produced.

3. To 1 part of the test substance add 10 ml of water, 2 ml of diazobenzenesulfonic acid TS and 2–3 drops of sodium hydroxide (~80 g/l) TS; a yellowish orange colour is produced.

CLOMIFENE CITRATE TABLETS

Description. Each tablet usually contains 50 mg of clomifene citrate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 10 mg of clomifene citrate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 4 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 1 drop of sulfuric acid (~1760 g/l) TS; an orange colour is produced which slowly changes to yellowish brown and finally to greenish brown.

2. To 1 part of the test substance add 1 ml of formaldehyde/sulfuric acid TS; a purplish brown colour is produced.

3. Dissolve 2 parts of the test substance in 5 ml of a mixture of 1 volume of acetic anhydride R and 5 volumes of pyridine R, and heat in a water-bath; a deep wine red colour is produced.

CLOXACILLIN SODIUM CAPSULES

Description. Each capsule contains cloxacillin sodium usually equivalent to 500 mg of cloxacillin.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 25 mg of cloxacillin.

2. Empty the capsules, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 3 ml of water, shake and filter. To the filtrate add 0.10 g of hydroxylamine hydrochloride R and 1.0 ml of sodium hydroxide (~80 g/l) TS and allow to stand for 5 minutes. Then add 1.3 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red colour is produced.

2. To 2 parts of the test substance add 5 ml of ethanol (~750 g/l) TS, shake and filter. Evaporate the filtrate using a stream of air at room temperature. Dissolve the residue in 2.0 ml of water and add 2.0 ml of a solution composed of 2.0 ml of potassio-cupric tartrate TS and 6 ml of water; a light blue solution is immediately produced.

3. To 1 part of the test substance add 1.0 ml of water, shake and filter. To the filtrate add 1 drop of ferric chloride (25 g/l) TS; a yellow-greenish precipitate is produced.

4. To 10 mg of paraformaldehyde R dissolved in about 1 ml of sulfuric acid (~1760 g/l) TS add a trace of the test substance; a light yellow colour is produced. Heat the mixture in a water-bath for 2 minutes and cool; the colour of the solution changes to brownish.

5. Moisten a small amount of the test substance with a few drops of hydrochloric acid (~250 g/l) TS and introduce it into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a bright yellow colour appears in the flame.

CODEINE PHOSPHATE TABLETS

Description. Each tablet usually contains 10–30 mg of codeine phosphate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 60 mg of codeine phosphate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with four 10-ml portions of ethanol (~750 g/l)

TS and filter. Evaporate the combined filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. Dissolve 10 mg of the test substance in 5 ml of sulfuric acid (~1760 g/l) TS, add 1 drop of ferric chloride (25 g/l) TS and, if necessary, heat gently; a violet-blue colour is produced. Add a few drops of nitric acid (~130 g/l) TS; the colour changes to dark red.

2. Dissolve about 1 mg of the test substance in 1 ml of formaldehyde/sulfuric acid TS; a dark violet colour is immediately produced.

3. Dissolve 20 mg of the test substance in 1.0 ml of water and add 1 drop of ferric chloride (25 g/l) TS; a precipitate is formed but no blue tinge is observed in the solution (distinction from morphine).

4. Dissolve 10 mg of the test substance in 2.0 ml of freshly boiled and cooled water and add a few drops of silver nitrate (40 g/l) TS; a yellow precipitate is produced. Divide the solution with the precipitate into 2 portions. To 1 portion add a few drops of nitric acid (~130 g/l) TS; the precipitate dissolves to a clear solution. To the other portion add a few drops of ammonia (~100 g/l) TS and shake well; again the precipitate dissolves to a clear solution.

COLCHICINE TABLETS

Description. Each tablet usually contains 500 µg of colchicine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 3 mg of colchicine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. Suspend 1 part of the test substance in 2.0 ml of water and filter; the filtrate is colourless. Add a few drops of hydrochloric acid (~70 g/l) TS; the colour of the solution turns to yellow.

2. To 1 part of the test substance add 1.0 ml of hydrochloric acid (~70 g/l) TS, heat to boiling for 2 minutes and add 3 drops of ferric chloride (25 g/l) TS; a deep yellowish green colour is produced.

3. Suspend 1 part of the test substance in 1.5 ml of ethanol (~750 g/l) TS and filter. Place a few drops of the filtrate on a porcelain dish and evaporate to dryness on a water-bath. Mix the residue with 3 drops of sulfuric acid (~1760 g/l) TS; a lemon yellow colour is produced. Add 1 drop of nitric acid (~1000 g/l) TS; the colour changes to greenish blue, turning rapidly reddish and finally yellowish. Following this add about 0.5 ml of sodium hydroxide (~200 g/l) TS; the colour turns to red.

CYCLOPHOSPHAMIDE TABLETS

Description. Each tablet usually contains 25 mg of cyclophosphamide. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.25 g of cyclophosphamide.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. Shake 1 part of the test substance with 5 ml of water and filter. To the filtrate add 5 ml of silver nitrate (40 g/l) TS; a solution that is just slightly opalescent is produced. Boil; a white precipitate is formed which is insoluble in nitric acid (~130 g/l) TS but soluble in ammonia (~100 g/l) TS.

2. Fuse 4 parts of the test substance with 0.06 g of potassium nitrate R and 0.08 g of potassium hydroxide R. Dissolve the residue in 20 ml of water and filter. To 5 ml of the filtrate add 1.5 ml of hydrochloric acid (~70 g/l) TS and 1.0 ml of ammonium molybdate (95 g/l) TS; a yellow precipitate is produced.

CYTARABINE INJECTION

Description. The injection is a sterile solution usually containing 20 mg of cytarabine in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 0.10 g of cytarabine and use directly as the test solution, dividing it into 5 equal volumes.

Identity tests

Colour and other reactions

1. To 2 volumes of the test solution add 0.5 ml of hydrochloric acid (~70 g/l) TS and 4–5 drops of sodium nitrite (10 g/l) TS, and shake well. After 2–3 minutes add 4–5 drops of 2-naphthol TS; a reddish yellow precipitate is produced. Shake the mixture; the colour of the precipitate turns to greenish black while the solution becomes reddish.

2. Dilute 1 volume of the test solution with 1.0 ml of water, add 0.5 ml of sodium hydroxide (~80 g/l) TS and heat in a water-bath for 3 minutes. Cool and add 0.5 ml of copper(II) acetate (45 g/l) TS; a greenish blue precipitate is formed. Warm on a water-bath for 5 minutes; the colour of the precipitate turns to reddish black.

3. Dilute 2 volumes of the test solution with 5 ml of water and add 1.0 ml of hydrochloric acid (~70 g/l) TS. Warm on a water-bath for 5 minutes, cool and divide the solution equally between 2 test-tubes: (a) To one test-tube add a few drops of potassium permanganate (10 g/l) TS; the purple colour is discharged. (b) To the other test-tube add 0.5 ml of bromine TS and shake; the colour of bromine is discharged.

DAPSONE TABLETS

Description. Each tablet usually contains 50–100 mg of dapsone.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.10 g of dapsone.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of warm acetone R, filter, evaporate the filtrate, dry at 105 °C for 30 minutes and use the residue as the test substance.

Identity tests

Melting point. The test substance melts at about 174 °C.

Colour and other reactions

1. Dissolve 0.05 g of the test substance in 2.0 ml of hydrochloric acid (~70 g/l) TS, cool in ice and add 4 ml of sodium nitrite (10 g/l) TS. Allow to stand for 2 minutes then pour the mixture into 2.0 ml of freshly prepared 2-naphthol TS containing 1.0 g of sodium acetate R; an orange-red precipitate is produced.

2. Dissolve 10 mg of the test substance in 1.0 ml of hydrochloric acid (~70 g/l) TS, add 5 ml of water and about 0.2 ml of formaldehyde TS and

mix; a milky suspension is produced which changes rapidly into a white precipitate.

DEXAMETHASONE TABLETS

Description. Each tablet usually contains 0.5–4.0 mg of dexamethasone.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to about 2 mg and 5 mg of dexamethasone.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 2 mg for test substance 1, divided into 2 parts; for the preparation of test substance 2, incinerate the equivalent of 5 mg with 1.0 g of calcium oxide R and use the white ashes obtained.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 2.0 ml of ethanol (~750 g/l) TS and shake. Then add 1.0 ml of potassio-cupric tartrate TS and heat to boiling; an orange precipitate is slowly produced.

2. Mix 2 drops of potassium dichromate (100 g/l) TS with 3 ml of sulfuric acid (~1760 g/l) TS and heat on a water-bath for 5 minutes; the solution wets the sides of the tube. Add test substance 2 to this solution, shake well and heat again for 5 minutes on a water-bath; the colour turns violet-black and the solution no longer wets the sides of the tube.

3. To 1 ml of formaldehyde/sulfuric acid TS add 1 part of test substance 1 and shake well; a yellow-orange colour is produced. Heat on a water-bath for 1 minute; the colour changes to dark brown.

DEXAMETHASONE SODIUM PHOSPHATE INJECTION

Description. The injection is a sterile solution of dexamethasone sodium phosphate usually containing the equivalent of 4.0 mg of dexamethasone in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 50 mg of dexamethasone, evaporate to dryness on a water-bath and use the white or pale yellow, waxy residue as the test substance.

Identity tests

Colour and other reactions

1. Dissolve 5 mg of the test substance in about 2 ml of sulfuric acid (~1760 g/l) TS, and allow to stand for a few minutes; a yellow or pale orange coloured solution is produced. Pour the solution into 10 ml of water; the colour fades and a yellow flocculent precipitate may occur.

2. Place about 0.5 ml of chromic acid TS in a small test-tube and heat in a water-bath for 5 minutes; the solution wets the sides of the tube but there is no greasiness. Add about 3 mg of the test substance and again heat in a water-bath for 5 minutes; the solution no longer wets the sides of the tube and does not pour easily from the tube.

3. Carefully heat 0.04 g of the test substance with about 2 ml of sulfuric acid (~1760 g/l) TS until white fumes are evolved; add nitric acid (~1000 g/l) TS drop by drop until oxidation is complete, and cool. Add 2.0 ml of water, heat until white fumes are again evolved, cool, add 10 ml of water, and neutralize with ammonia (~100 g/l) TS using pH-indicator paper R. Use this solution for reactions (a) and (b). (a) Introduce the solution into a nonluminous flame using a magnesia stick, or a nichrome or platinum wire sealed to a glass rod; the flame acquires a bright yellow colour. (b) To the remaining solution add 5 ml of ammonium molybdate (95 g/l) TS, acidify with nitric acid (~130 g/l) TS, and heat; a yellow-brown precipitate is produced which is readily soluble in ammonia (~100 g/l) TS (about 15 ml).

DIAZEPAM INJECTION

Description. The injection is a sterile solution usually containing 5.0 mg of diazepam in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 60 mg of diazepam and use directly as the test solution.

Identity tests

Colour and other reactions

1. To one-fifth of the volume of the test solution add about 1 ml of hydrochloric acid (~250 g/l) TS and heat on a water-bath for 30 minutes; a yellow solution is produced. Cool and dilute with about 10 ml of ice-water; a yellow, crystalline precipitate is formed.

2. To four-fifths of the volume of the test solution add 10 ml of water and shake with 10 ml of chloroform R. Separate the chloroform layer and evaporate to dryness on a water-bath. Add 10 mg of triketohydrindene hydrate R and 0.5 ml of ethanol (~750 g/l) TS. Heat on a water-bath for 2 minutes and add 5 ml of ethanol (~750 g/l) TS; a bluish colour is produced. To this solution

add 2 drops of a mixture composed of 2 drops of copper(II) sulfate (160 g/l) TS and 3.0 ml of water; an orange-red colour is produced.

DIAZEPAM TABLETS

Description. Each tablet usually contains 2–5 mg of diazepam. The tablets may be coated and contain a dye.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.20 g of diazepam.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, shake it with two 5-ml volumes of chloroform R, filter, evaporate the combined filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. Dissolve 0.10 g of the test substance in 3 ml of hydrochloric acid (~250 g/l) TS and heat on a water-bath for 30 minutes; a brownish yellow solution is produced. Cool, dilute with about 10 ml of ice-water and allow to precipitate in a refrigerator overnight. Filter the crystalline precipitate, wash with water and dry at 80 °C for 2 hours; melting point, about 94 °C.

2. To 0.05 g of the test substance add 10 mg of triketohydrindene hydrate R and 0.5 ml of ethanol (~750 g/l) TS; a pale yellowish green colour is produced. Then add 2 drops of a mixture composed of 2 drops of copper(II) sulfate (160 g/l) TS and 3 ml of water; the colour changes to yellow-orange.

3. To about 10 mg of the test substance add 5 ml of sulfuric acid (~5 g/l) TS and heat on a water-bath for 3–5 minutes; a pale yellow colour is produced.

DIETHYLCARBAMAZINE DIHYDROGEN CITRATE TABLETS

Description. Each tablet usually contains 50 mg of diethylcarbamazine dihydrogen citrate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.2 g of diethylcarbamazine dihydrogen citrate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance.

Identity tests

Colour and other reactions

1. Shake the test substance with 10 ml of water and filter. Transfer the filtrate to a separating funnel, add 1 ml of sodium hydroxide (~400 g/l) TS and extract with 20 ml, 15 ml and 10 ml of chloroform R. Keep the aqueous layer for test 2. Evaporate the combined chloroform extracts on a water-bath, towards the end drying with the aid of a current of air. Dissolve the oily residue in 10 ml of ethyl acetate R, warming the mixture to 50 °C, and pour into 2 ml of a solution containing 1 g of maleic acid R in 10 ml of acetone R, warming again to 50 °C. Cool, rub the inside of the tube with a glass rod to induce crystallization, collect the white precipitate on a sintered-glass filter, wash twice with 1 ml of acetone R and once with 5 ml of ethyl acetate R and dry in a desiccator; melting point, 126–128 °C.

2. Filter the aqueous layer from test 1. Add 1 drop of phenolphthalein/ethanol TS and neutralize with sulfuric acid (~100 g/l) TS. Then add 2 ml of mercuric sulfate TS, heat to boiling and add, drop by drop, potassium permanganate (10 g/l) TS; the purple colour is discharged and a white precipitate is produced.

DIGITOXIN TABLETS

Description. Each tablet usually contains 50-100 µg of digitoxin.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.15 mg of digitoxin.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. To 2 parts of the test substance add 2.0 ml of a solution prepared by mixing 0.5 ml of ferric chloride (25 g/l) TS with 100 ml of glacial acetic acid R and shake. Cautiously add this solution to form an upper layer above 1 ml of sulfuric acid (~1760 g/l) TS; a brown ring, but no red colour, is produced at the junction of the two liquids and, after some time, the acetic acid layer acquires a blue colour.

2. To 1 part of the test substance add 5 ml of ethanol (~750 g/l) TS and 3 ml of alkaline trinitrophenol TS; an orange-yellow colour is produced slowly.

DIGOXIN INJECTION

Description. The injection is a sterile solution usually containing 250 µg of digoxin in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 1.5 mg of digoxin and use directly as the test solution, dividing it into 3 equal volumes.

Identity tests

Colour and other reactions

1. Evaporate 2 volumes of the test solution to dryness on a water-bath. To the residue add 2.0 ml of a solution prepared by mixing 0.5 ml of ferric chloride (25 g/l) TS with 100 ml of glacial acetic acid R and shake. Cautiously add this solution to form an upper layer above 1 ml of sulfuric acid (~1760 g/l) TS; a brown ring, but no red colour, is produced at the junction of the two liquids and, after some time, the acetic acid layer acquires a bluish green colour.

2. To 1 volume of the test solution add 5 ml of ethanol (~750 g/l) TS and 3 ml of alkaline trinitrophenol TS; a yellow colour is produced which darkens with time.

DIGOXIN ORAL SOLUTION

Description. The solution usually contains 50 µg of digoxin in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the containers equivalent to 0.25 mg of digoxin and use directly as the test solution, dividing it into 2 equal volumes.

Identity tests

Colour and other reactions

1. To 1 volume of the test solution add 2.0 ml of a solution prepared by mixing 0.5 ml of ferric chloride (25 g/l) TS with 100 ml of glacial acetic acid R and shake. Cautiously add this solution to form an upper layer above 1 ml of sulfuric acid (~1760 g/l) TS; a brown ring, but no red colour, is produced at the junction of the two liquids.

2. To 1 volume of the test solution add 5 ml of ethanol (~750 g/l) TS and 3 ml of alkaline trinitrophenol TS; a yellow colour is produced, which darkens with time.

DIGOXIN TABLETS

Description. Each tablet usually contains 0.0625–0.25 mg of digoxin.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to about 1 mg of digoxin.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 2.0 ml of a solution prepared by mixing 0.5 ml of ferric chloride (25 g/l) TS with 100 ml of glacial acetic acid R and shake. Filter and cautiously add the filtrate to form an upper layer above 1 ml of sulfuric acid (~1760 g/l) TS; a brown ring, but no red colour, is produced at the junction of the two liquids and, after some time, the acetic acid layer acquires a bluish green colour.

2. To 1 part of the test substance add 5 ml of ethanol (~750 g/l) TS and 3 ml of alkaline trinitrophenol TS; a yellow colour is produced, which darkens with time.

DOPAMINE HYDROCHLORIDE INJECTION

Description. The injection is a sterile solution usually containing 40 mg of dopamine hydrochloride in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the ampoules equivalent to 100 mg of dopamine hydrochloride and use directly as test solution 1, dividing it into 2 equal volumes.

2. If necessary, dilute 1 volume of test solution 1 with water to 5 ml and use as test solution 2.

3. Evaporate 1.0 ml of test solution 2 to dryness on a water-bath and use the residue as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. Dilute 0.5 ml of test solution 2 with water to 2.0 ml and add 5 drops of ferric chloride (25 g/l) TS; a green colour is produced.

2. Add 1 part of the test substance to 1 ml of formaldehyde/sulfuric acid TS; an intense violet colour is produced immediately.

3. Dissolve 1 part of the test substance in 2.0 ml of sodium hydroxide (~80 g/l) TS; the solution turns orange. Heat to boiling; vapours are evolved. Insert moistened pH-indicator paper R into the vapours; its coloration is changed to an alkaline range and the colour of the solution turns to dark brown.

4. Dilute 0.5 ml of test solution 2 with water to 2.0 ml, add 2 drops of nitric acid (~130 g/l) TS and 0.5 ml of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

5. To 1 volume of test solution 1 add 10 ml of a saturated solution of trinitrophenol R in water and mix. Filter the precipitate, wash first with water, then with a small volume of ethanol (~750 g/l) TS, and dry at 105 °C; melting temperature, about 202 °C with decomposition.

DOXYCYCLINE HYCLATE CAPSULES

Description. Each capsule contains doxycycline hyclate usually equivalent to 100 mg of doxycycline.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amounts equivalent to 5 mg and 0.10 g of doxycycline.

2. Empty the capsules, weigh out the above-calculated equivalent amounts and use directly: 5 mg for test substance 1 and 0.10 g for test substance 2.

3. Shake test substance 2 with 10 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To test substance 1 add about 2 ml of sulfuric acid (~1760 g/l) TS; an intense yellow colour is produced.

2. Heat carefully 2.0 ml of zinc chloride (500 g/l) TS in a porcelain dish on a hot plate or over a small flame until a skin forms on the surface of the solution. Then add 2 drops of the test solution and continue to warm for 1 minute; the yellow colour imparted by the test solution becomes more intense.

3. To 2.0 ml of the test solution add 1 drop of ferric chloride (25 g/l) TS; a dark red-brown colour is produced.

4. To 2.0 ml of the test solution add 1 drop of alkaline potassio-mercuric iodide TS; a light yellow, fine crystalline precipitate is formed. In an excess of the reagent and on shaking the precipitate dissolves.

5. To 1.0 ml of the test solution add 5 drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is formed which dissolves on addition of 1.0 ml of ammonia (~100 g/l) TS.

EPHEDRINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 30 mg of ephedrine hydrochloride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of ephedrine hydrochloride.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of water, filter, evaporate the filtrate almost to dryness, allow to crystallize from water, separate the crystals, dry them at 105 °C for 1 hour and use the dried material as the test substance, dividing it into 4 equal parts.

Identity tests

Melting point. The test substance melts at about 186 °C.

Colour and other reactions

1. Dissolve 1 part of the test substance in 1.0 ml of water, add 1–2 drops of copper(II) sulfate (160 g/l) TS followed by 2.0 ml of sodium hydroxide (~80 g/l) TS; a violet colour is produced. To this solution add 2.0 ml of 1-butanol R and shake; a reddish violet colour is produced in the butanol layer.

2. Dissolve 1 part of the test substance in 5 ml of water, add a few drops of sodium hydroxide (~80 g/l) TS and 3 ml of potassium ferricyanide (50 g/l) TS and heat on a water-bath; a characteristic odour of benzaldehyde is perceptible.

3. Dissolve 1 part of the test substance in 2.0 ml of water and add a few drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

EPINEPHRINE HYDROCHLORIDE OPHTHALMIC SOLUTION

Description. The solution contains epinephrine hydrochloride usually equivalent to 20 mg of epinephrine in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the containers equivalent to 40 mg of epinephrine and use directly as the test solution, dividing it into 4 equal volumes.

Identity tests

Colour and other reactions

1. To 1 volume of the test solution add 1–2 drops of ferric chloride (25 g/l) TS; a green or emerald green colour is produced. Add 1 drop of ammonia (~260 g/l) TS; the colour of the solution changes to red.

2. To 1 volume of the test solution add 2.0 ml of water and 0.5 ml of sodium nitrite (10 g/l) TS; within 10 minutes a deep red colour is produced.

3. To 1 volume of the test solution add 2.0 ml of nitric acid (~130 g/l) TS and shake well. Add 0.5 ml of silver nitrate (40 g/l) TS; a white precipitate is produced.

4. To 1 volume of the test solution add 2–3 drops of sulfuric acid (~1760 g/l) TS and 2.0 ml of ammonium molybdate (95 g/l) TS and mix; a yellow colour develops. Add 2.0 ml of sodium hydroxide (~80 g/l) TS; the colour of the solution changes to greenish yellow.

ERGOMETRINE HYDROGEN MALEATE INJECTION

Description. The injection is a sterile solution usually containing 200 µg of ergometrine hydrogen maleate in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 1.0 mg of ergometrine hydrogen maleate and use directly as the test solution, dividing it into 5 equal volumes.

Identity tests

Colour and other reactions

1. The test solution shows a blue fluorescence in ultraviolet light (365 nm).

2. To 1 volume of the test solution slowly add 2.0 ml of 4-dimethylamino-benzaldehyde TS; a blue colour is slowly produced.

3. To 2 volumes of the test solution add 3 ml of tartaric acid (10 g/l) TS and 5 drops of ammonia (~100 g/l) TS and extract three times with 5 ml of chloroform R. Evaporate the combined chloroform layers to dryness using a stream of air. Dissolve the residue in 5 ml of tartaric acid (10 g/l) TS and add 2 drops of potassio-mercuric iodide TS; no turbidity is produced (distinction from ergotamine tartrate).

ERGOMETRINE HYDROGEN MALEATE TABLETS

Description. Each tablet usually contains 200 µg of ergometrine hydrogen maleate. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 2.0 mg of ergometrine hydrogen maleate.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 2 equal parts.

3. Shake 1 part of the test substance with 5 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. The test solution shows a blue fluorescence in ultraviolet light (365 nm).

2. To 1.0 ml of the test solution slowly add 2.0 ml of 4-dimethylamino-benzaldehyde TS; a blue colour is slowly produced.

3. To 1 part of the test substance add 10 ml of tartaric acid (10 g/l) TS, shake for 5 minutes and filter. To 5 ml of the clear filtrate add 5 drops of ammonia (~100 g/l) TS and extract three times with 5 ml of chloroform R. Evaporate the combined chloroform layers to dryness using a stream of air. Dissolve the residue in 5 ml of tartaric acid (10 g/l) TS and add 2 drops of potassio-mercuric iodide TS; no turbidity is produced (distinction from ergotamine tartrate).

ERGOTAMINE TARTRATE TABLETS

Description. Each tablet usually contains 2.0 mg of ergotamine tartrate. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 2.0 mg of ergotamine tartrate.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, shake it with 20 ml of tartaric acid (10 g/l) TS, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. The test solution shows a blue fluorescence in ultraviolet light (365 nm).

2. To 1.0 ml of the test solution slowly add 2.0 ml of 4-dimethylaminobenzaldehyde TS and mix; a bluish violet colour is slowly produced.

3. To 2.0 ml of the test solution add 2 drops of potassio-mercuric iodide TS; a white turbidity is produced (distinction from ergometrine hydrogen maleate).

ERYTHROMYCIN ESTOLATE CAPSULES

Description. Each capsule contains erythromycin estolate usually equivalent to 125–250 mg of erythromycin.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 25 mg of erythromycin.

2. Empty the capsules, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. To 2 parts of the test substance add 2 drops of water and cautiously add 2 ml of sulfuric acid (~1760 g/l) TS; a dark red-brown colour is produced, which on dilution with water gives a dark greenish solution.

2. To 2 parts of the test substance add 2.0 ml of acetone R and 2 ml of hydrochloric acid (~250 g/l) TS, and heat gently to boiling; a pale orange colour is produced which changes immediately to purple or deep violet. Add 2.0 ml of chloroform R and shake; the chloroform layer acquires a bluish green colour.

3. To 1 part of the test substance add 1.0 ml of ethanol (~750 g/l) TS and add 0.5 ml of potassium permanganate (10 g/l) TS; the purple colour is discharged leaving a brownish precipitate.

ERYTHROMYCIN STEARATE TABLETS

Description. Each tablet contains erythromycin stearate usually equivalent to 250 mg of erythromycin. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping or by dissolving in acetone R and drying the core in air. Weigh 1 tablet or core and calculate the amounts equivalent to 20 mg and 0.10 g of erythromycin.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts and use directly: 20 mg for test substance 1, dividing it into 2 equal parts; for test substance 2, shake 0.10 g with 10 ml of chloroform R, filter, evaporate the filtrate to dryness on a water-bath and use the residue.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 2 drops of water and cautiously add 2 ml of sulfuric acid (~1760 g/l) TS; a dark violet-brown colour is produced which on dilution with water gives a brownish solution.

2. To 1 part of test substance 1 add 2.0 ml of acetone R and 2 ml of hydrochloric acid (~250 g/l) TS and shake; a pale orange colour is produced, which changes immediately to red or red-purple. Add 2.0 ml of chloroform R and shake; the chloroform layer acquires a purple colour.

3. Gently heat test substance 2 with 10 ml of water and 5 ml of hydrochloric acid (~70 g/l) TS until the solution boils; oily globules rise to the surface. Cool, remove the fatty layer and heat it with 3.0 ml of sodium hydroxide (0.1 mol/l) VS. Allow to cool; the solution sets to a gel. Add 10 ml of hot water, shake and heat the mixture for 2–3 minutes; on shaking the solution froths. To 1.0 ml of the resulting solution add 2.0 ml of calcium chloride (55 g/l) TS; a granular precipitate is produced, which is insoluble in hydrochloric acid.

ETHAMBUTOL HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 100–500 mg of ethambutol hydrochloride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 0.075 g and 20 mg of ethambutol hydrochloride.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.075 g for test substance 1; 20 mg for test substance 2.

Identity tests

Colour and other reactions

1. Shake test substance 1 with 5 ml of water and filter. To the filtrate add 2–4 drops of copper(II) sulfate (160 g/l) TS and 1.0 ml of sodium hydroxide (~80 g/l) TS; a distinct blue solution is produced.

2. Suspend test substance 2 in 5 ml of water and filter. To the filtrate add 0.5 ml of nitric acid (~130 g/l) TS and 1.0 ml of silver nitrate (40 g/l) TS; a white precipitate is produced. Add a few drops of ammonia (~100 g/l) TS; the precipitate dissolves.

ETHINYLESTRADIOL TABLETS

Description. Each tablet usually contains 50 µg of ethinylestradiol. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 2.5 mg of ethinylestradiol.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, shake it with 25 ml of dehydrated ethanol R, and filter. Use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. Evaporate 10 ml of the test solution to dryness on a water-bath. To the residue add about 1 ml of sulfuric acid (~1760 g/l) TS; an orange solution is produced. Dilute the solution with 10 ml of water; a red-violet colour is produced.

2. Evaporate 10 ml of the test solution to dryness on a water-bath. To the residue add 0.5 ml of ethanol (~750 g/l) TS and about 1 ml of sulfuric acid (~1760 g/l) TS; an orange solution is produced which shows a green fluorescence. Dilute the solution with 5 ml of ethanol (~750 g/l) TS; a red-violet solution is produced which shows a green fluorescence.

FERROUS SULFATE TABLETS

Description. Each tablet contains ferrous sulfate or dried ferrous sulfate usually equivalent to 60 mg of iron. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.3 g of ferrous sulfate.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 5 ml of water, then add ammonia (~100 g/l) TS drop by drop until a bluish-green precipitate is produced. Shake the mixture vigorously; the precipitate turns dark green, then greenish brown and, on standing, brown.

2. Add 1 part of the test substance to a mixture composed of 3 ml of water and 4 drops of hydrochloric acid (~70 g/l) TS, then add 1.0 ml of potassium ferricyanide (50 g/l) TS; a dark blue precipitate is produced.

   Alternative colour test:
   Sprinkle a few crystals of potassium ferricyanide R on a small quantity of moistened test substance; deep blue spots appear.

3. Add 1 part of the test substance to a mixture composed of 3 ml of water and 4 drops of hydrochloric acid (~70 g/l) TS, shake well and filter. Then add to the filtrate 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

FLUOROURACIL INJECTION

Description. The injection is a sterile solution usually containing 50 mg of fluorouracil in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 250 mg of fluorouracil and add a few drops of hydrochloric acid (~70 g/l) TS until slightly acid to pH-indicator paper R. Filter, wash the precipitate with small amounts of water, dry it at 105 °C and use as the test substance.

Identity tests

Colour and other reactions

1. To 0.05 g of the test substance add 5 ml of water and about 1 ml of bromine TS and shake; the colour is discharged immediately.

2. Transfer 0.5 ml of chromic acid TS to a small test-tube and heat in a water-bath for 5 minutes; the solution wets the sides of the tube, but there is no

greasiness. Add 2–3 mg of the test substance and again heat in a water-bath for 5 minutes; the solution does not wet the sides of the tube and does not pour easily from the tube.

FLUPHENAZINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 0.25–5.0 mg of fluphenazine hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 20 mg of fluphenazine hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 4 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 5 ml of ethanol (~750 g/l) TS, shake, and cautiously add about 2 ml of sulfuric acid (~1760 g/l) TS; at the junction of the two solutions a pink colour is observed which becomes yellow on mixing.

2. To 1 part of the test substance add 2 ml of a mixture of 3 ml of sulfuric acid (~1760 g/l) TS and 2 drops of formaldehyde TS; an orange colour is produced. Heat on a water-bath for 2 minutes; the colour turns to dark brown.

3. To 1 part of the test substance add 2.0 ml of water and filter. To the filtrate add 3 drops of potassium dichromate (100 g/l) TS and shake; a yellow precipitate is produced.

4. To 1 part of the test substance add 2.0 ml of water, shake and filter. To the filtrate add 3 drops of nitric acid (~130 g/l) TS; a white, curdy precipitate is produced. Add a few drops of ammonia (~100 g/l) TS; the precipitate dissolves.

FOLIC ACID TABLETS

Description. Each tablet usually contains 1.0 mg of folic acid.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 50 mg of folic acid.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 2.0 ml of hydrochloric acid (~70 g/l) TS, shake and filter. To the filtrate add 2 drops of liquefied phenol R and 3 drops of potassium bromate (15 g/l) TS; a dark red colour is produced.

2. Prepare a suspension by adding 18 ml of water and 2.0 ml of ammonia (~100 g/l) TS to 4 parts of the test substance and shaking. To test-tube A transfer 5 ml of the suspension and add 0.5 ml of potassium permanganate (10 g/l) TS. To test-tube B transfer 1.0 ml of the suspension and add 5 ml of water. To both tubes add 2.0 ml of sodium nitrite (10 g/l) TS and 2.5 ml of hydrochloric acid (~70 g/l) TS, mix and allow to stand for 2 minutes. Then add to both tubes 0.5 ml of a solution prepared by dissolving 0.25 g of 2-naphthol R in 15 ml of sodium hydroxide (~80 g/l) TS; an intense reddish brown colour is produced in test-tube A, whereas a yellowish colour is formed in test-tube B.

FUROSEMIDE INJECTION

Description. The injection is a sterile solution usually containing 10 mg of furosemide in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 40 mg of furosemide, evaporate to dryness on a water-bath, shake the residue with 10 ml of acetone R and filter. Evaporate the filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. To 25 mg of the test substance add 5 ml of ethanol (~750 g/l) TS, heat on a water-bath for 2–3 minutes and add 3.0 ml of 4-dimethylaminobenzaldehyde TS without shaking; a yellow-green colour is produced which changes to red starting from the bottom of the test-tube.

2. Dissolve 5 mg of paraformaldehyde R in about 1 ml of sulfuric acid (~1760 g/l) TS and add 5 mg of the test substance; a yellow colour is obtained (retain the solution for test 3).

3. Heat the solution from test 2 on a water-bath for 5 minutes; the colour of the solution changes to red-brown. Carefully add 10 ml of water; the colour changes to light green.

FUROSEMIDE TABLETS

Description. Each tablet usually contains 40 mg of furosemide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 40 mg and 5 mg of furosemide.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 40 mg for test substance 1; 5 mg for test substance 2.

3. Shake test substance 1 with 10 ml of ethanol (~750 g/l) TS, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 5 ml of the test solution add 2.0 ml of 4-dimethylaminobenzaldehyde TS; a deep red colour is produced.

2. Dissolve 5 mg of paraformaldehyde R in 1 ml of sulfuric acid (~1760 g/l) TS and add test substance 2; a deep yellow colour is produced with a brownish tinge (retain the solution for test 3).

3. Heat the solution obtained in test 2 on a water-bath for 5 minutes; the colour of the solution changes to red-brown.

GLIBENCLAMIDE TABLETS

Description. Each tablet usually contains 1.75–25 mg of glibenclamide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 50 mg of glibenclamide.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. Mix 1 part of the test substance with 0.04 g of anhydrous sodium carbonate R and 0.04 g of potassium carbonate R. Ignite the mixture and cool. To the residue add 5 ml of hot water, stir well and filter. Acidify 2.0 ml of the filtrate with nitric acid (~130 g/l) TS, and add 2 drops of silver nitrate (40 g/l) TS; a white precipitate is produced. Acidify a further 2.0 ml of the filtrate with hydrochloric acid (~70 g/l) TS, and add 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is formed.

2. Boil 1 part of the test substance with about 1 ml of sodium hydroxide (~200 g/l) TS; the fumes evolved change moistened red litmus paper R to blue.

3. Extract 3 parts of the test substance with three successive portions, each of 10 ml, of a mixture of 2 volumes of dichloromethane R and 1 volume of acetone R. Filter the extracts through the same dry filter-paper, evaporate the combined filtrate to dryness, recrystallize the residue using a mixture of equal volumes of acetone R and methanol R, separate the crystals and dry at 105 °C; melting temperature, about 169 °C. Mix a portion of the residue with an equal amount of tolbutamide R; eutectic temperature, about 114 °C.

GLUCOSE INJECTION

Description. The injection is a sterile solution usually containing 50–500 mg of glucose in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the containers equivalent to 0.25 g of glucose and use directly as the test solution.

2. Evaporate the equivalent amount of about 0.25 g of glucose on a water-bath and use the viscous residue as the test substance.

Identity tests

Heating behaviour. Heat gently a small quantity of the test substance; it becomes yellow, then brown, and an odour of burnt sugar is perceptible. Heat further to ignition; the melt swells, then burns and chars.

Colour and other reactions. To 5 ml of the test solution add 1.0 ml of potassio-cupric tartrate TS and heat on a water-bath for 10 minutes; a brick red precipitate is formed.

GLYCERYL TRINITRATE TABLETS

Description. Each tablet usually contains 500 µg of glyceryl trinitrate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to about 1 mg and 5 mg of glyceryl trinitrate.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: for test substance 1, shake about 1 mg with 10 ml of dehydrated ethanol R, filter, evaporate the filtrate to dryness using a stream of air, and use the residue, dividing it into 2 equal parts; 5 mg for test substance 2.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 5 ml of water and a few drops of sulfuric acid (~100 g/l) TS. Then add 0.10 g of potassium iodide R and a few drops of starch TS and shake; the liquid remains colourless. Add 1.0 ml of sodium hydroxide (~80 g/l) TS and heat gently to boiling. Cool and add 3 ml of sulfuric acid (~100 g/l) TS; a dark blue colour is produced immediately.

2. To 1 part of test substance 1 add 3–4 drops of sodium hydroxide (~80 g/l) TS and 3 ml of ferrous sulfate (15 g/l) TS and shake; a greenish brown precipitate is produced.

3. Shake test substance 2 with 3 ml of ethanol (~750 g/l) TS and filter. To the filtrate carefully add 1 ml of diphenylamine/sulfuric acid TS to form a lower layer; a dark blue colour is produced at the interface of the two layers.

GRISEOFULVIN TABLETS

Description. Each tablet usually contains 125–250 mg of griseofulvin.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 20 mg of griseofulvin.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 4 equal parts.

Identity tests

Melting behaviour. The test substance melts at about 216 °C with decomposition.

Colour and other reactions

1. Suspend 2 parts of the test substance in 1.0 ml of ethanol (~750 g/l) TS, add 0.20 g of sodium sulfite R and 1.0 ml of sodium hydroxide (~80 g/l) TS. Heat on a water-bath and allow to stand for about 10 minutes; a lemon-yellow colour is produced.

2. To 1 part of the test substance add about 1 ml of sulfuric acid (~1760 g/l) TS; a yellow-orange colour is produced. Add 1 drop of potassium dichromate (100 g/l) TS; the colour of the solution changes to wine-red.

HALOPERIDOL INJECTION

Description. The injection is a sterile solution usually containing 5.0 mg of haloperidol in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the ampoules equivalent to 20 mg of haloperidol and use directly as test solution 1, dividing it into 2 equal volumes.

2. To 1 volume of test solution 1 add 5 ml of water and 1.0 ml of sodium hydroxide (~80 g/l) TS, extract with 10 ml of chloroform R, filter and evaporate the filtrate to dryness. Use the residue as the test substance.

3. Transfer half of 1 volume of test solution 1 to a porcelain or fused silica crucible, add 20 mg of anhydrous sodium carbonate R and evaporate to dryness on a water-bath. Heat until a white residue is obtained, dissolve it in 2.0 ml of water warming gently on a water-bath, cool, neutralize with hydrochloric acid (~70 g/l) TS and use as test solution 2.

Identity tests

Melting point. The test substance melts at about 150 °C.

Colour and other reactions

1. In a test-tube mix 1 drop of ferric chloride (25 g/l) TS with 1 drop of ammonium thiocyanate (75 g/l) TS, dilute with 10 ml of water and acidify with 1 drop of hydrochloric acid (~70 g/l) TS. To 1.0 ml of this solution, add test solution 2 drop by drop; the red colour is discharged.

2. Evaporate half of 1 volume of test solution 1 to dryness from a porcelain dish on a water-bath. To the residue add 1.0 ml of ammonium molybdate/ sulfuric acid TS; a greyish blue colour is gradually produced.

HALOPERIDOL SOLUTION

Description. The solution usually contains 2.0 mg of haloperidol in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the containers equivalent to 20 mg of haloperidol and use directly as test solution 1, dividing it into 2 equal volumes.

2. To 1 volume of test solution 1 add 5 ml of water and 1.0 ml of sodium hydroxide (~80 g/l) TS, extract with 10 ml of chloroform R, filter and evaporate the filtrate to dryness. Use the residue as the test substance.

3. Transfer half of 1 volume of test solution 1 to a porcelain or fused silica crucible, add 20 mg of anhydrous sodium carbonate R and evaporate to dryness on a water-bath. Heat until a white residue is obtained, dissolve it in 2.0 ml of water, warming gently on a water-bath, cool, neutralize with hydrochloric acid (~70 g/l) TS and use as test solution 2.

Identity tests

Melting point. The test substance melts at about 150 °C.

Colour and other reactions

1. In a test-tube mix 1 drop of ferric chloride (25 g/l) TS with 1 drop of ammonium thiocyanate (75 g/l) TS, dilute with 10 ml of water and acidify with 1 drop of hydrochloric acid (~70 g/l) TS. To 1.0 ml of this solution add test solution 2 drop by drop; the red colour is discharged.

2. Evaporate half of 1 volume of test solution 1 to dryness from a porcelain dish on a water-bath. To the residue add 1.0 ml of ammonium molybdate/sulfuric acid TS; a greyish blue colour is gradually produced.

HALOPERIDOL TABLETS

Description. Each tablet usually contains 2–5 mg of haloperidol.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 20 mg of haloperidol.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as test substance 1, dividing it into 2 equal parts.

3. Shake 1 part of test substance 1 with 10 ml of chloroform R for 5 minutes, filter into a porcelain or fused silica crucible, add 20 mg of anhydrous

sodium carbonate R and evaporate to dryness on a water-bath. Heat until a white residue is obtained, dissolve it in 2.0 ml of water, warming gently on a water-bath, cool, neutralize with hydrochloric acid (~70 g/l) TS and use as the test solution.

4. To 1 part of test substance 1 add 10 ml of water and 1.0 ml of sodium hydroxide (~80 g/l) TS, extract with 10 ml of chloroform R, filter and evaporate the filtrate to dryness. Recrystallize the residue from ethanol (~750 g/l) TS and use as test substance 2.

Identity tests

Melting point. Test substance 2 melts at about 150 °C.

Colour reaction. In a test-tube mix 1 drop of ferric chloride (25 g/l) TS with 1 drop of ammonium thiocyanate (75 g/l) TS, dilute with 10 ml of water and acidify with 1 drop of hydrochloric acid (~70 g/l) TS. To 1.0 ml of this solution add the test solution drop by drop; the red colour is discharged.

HOMATROPINE HYDROBROMIDE OPHTHALMIC SOLUTION

Description. The solution usually contains 20 mg of homatropine hydrobromide in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the containers equivalent to 50 mg of homatropine hydrobromide, evaporate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. Heat cautiously in a dry test-tube 10 mg of the test substance with 2–3 drops of sulfuric acid (~1760 g/l) TS until a brown colour is produced. Cool, add 5 ml of water and boil; an odour of benzaldehyde is perceptible.

2. Place 5 mg of the test substance in a porcelain dish, add about 0.5 ml of nitric acid (~1000 g/l) TS and about 0.5 ml of acetic anhydride R and evaporate to dryness on a water-bath; a yellow residue is obtained. To the cooled residue add 0.5 ml of acetone R and a few drops of potassium hydroxide/ethanol TS; a violet colour is produced which disappears on standing. Repeat test 2 without the addition of acetic anhydride R; no violet colour is produced (distinction from atropine and hyoscine).

HYDROCHLOROTHIAZIDE TABLETS

Description. Each tablet usually contains 25–50 mg of hydrochlorothiazide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.15 g of hydrochlorothiazide.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

3. Suspend 1 part of the test substance in 5 ml of dehydrated ethanol R. Place a strip of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 5 ml of sodium carbonate (50 g/l) TS, shake and filter. To the filtrate add 1.5 ml of potassium permanganate (10 g/l) TS; the colour of the solution turns from violet to brown and on standing a colloidal precipitate is produced.

   Alternative test by filter-paper technique:
   On the test paper place 1 drop of sodium carbonate (50 g/l) TS followed by 1 drop of potassium permanganate (10 g/l) TS; after a few minutes the colour of the spot turns from violet to brown.

2. Using a test-tube, carefully fuse 1 part of the test substance with about 0.1 g of quickly ground sodium hydroxide R, avoiding carbonization; ammonia is evolved. Insert moistened pH-indicator paper R into the vapours; its coloration is changed to an alkaline range. Dissolve the melt in 2.0 ml of water. Filter and divide the filtrate into 2 equal volumes: (a) Acidify 1 volume with 1.0 ml of nitric acid (~130 g/l) TS and add a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced which dissolves in ammonia (~100 g/l) TS and reprecipitates upon addition of nitric acid (~130 g/l) TS. (b) To the second volume add iodine TS, drop by drop, until a pale yellow colour appears. Add a few drops of barium chloride (50 g/l) TS; a white, crystalline precipitate is produced.

IBUPROFEN TABLETS

Description. Each tablet usually contains 200 mg of ibuprofen.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.5 g of ibuprofen.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 20 ml of acetone R, filter and allow the filtrate to evaporate to dryness without heating. Crystallize the residue from 10 ml of acetone R, separate the crystals, allow to dry in air and use the residue as the test substance.

Identity tests

Melting point. The test substance melts at about 76 °C.

Colour and other reactions

1. Dissolve 30 mg of the test substance in 2.0 ml of ethanol (~750 g/l) TS, dilute with 2.0 ml of water and add 0.05 g of sodium hydrogen carbonate R; a gas is evolved.

2. To 0.06 g of the test substance add 6 drops of thionyl chloride R and heat on a water-bath for 30 minutes. Separately dissolve 0.30 g of hydroxylamine hydrochloride R and 1 pellet of potassium hydroxide R in 3 ml of methanol R. Filter and transfer 2.0 ml of the filtrate to the above mixture. Heat carefully on a water-bath for 2 minutes, add 1.0 ml of hydrochloric acid (~70 g/l) TS and 3 drops of ferric chloride (25 g/l) TS; a brownish red solution is produced.

IMIPRAMINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 10–25 mg of imipramine hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amounts equivalent to 5 mg and 100 mg of imipramine hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: 5 mg for test substance 1; 100 mg for test substance 2, divided into 4 equal parts.

3. Suspend 2 parts of test substance 2 in 10 ml of water, place 1 strip of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Colour and other reactions

1. Shake test substance 1 with 2.0 ml of water and filter. To the filtrate add

about 0.5 ml of nitric acid (~1000 g/l) TS; an intense blue colour is produced, which turns yellow on standing.

Alternative test by filter-paper technique:
On the test paper place 1 drop of nitric acid (~1000 g/l) TS; an intense blue spot is produced.

2. To 1 part of test substance 2 add 2.0 ml of water, shake and filter. To the filtrate add a few drops of mercuric chloride (65 g/l) TS; a white turbidity is produced.

3. To 1 part of test substance 2 add 2.0 ml of water, shake and filter. To the filtrate add a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

INDOMETACIN CAPSULES

Description. Each capsule usually contains 25 mg of indometacin.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 50 mg of indometacin.

2. Empty the capsules, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 1.0 ml of water and 1 drop of sodium hydroxide (~80 g/l) TS, shake and filter. To the filtrate add 1.0 ml of sodium nitrite (10 g/l) TS, allow to stand for 5 minutes and cautiously add about 0.5 ml of hydrochloric acid (~250 g/l) TS; a green colour is produced.

2. Mix 1 part of the test substance with 2.0 ml of water and 2.0 ml of sodium hydroxide (~80 g/l) TS; a strong yellow colour is produced, which fades rapidly.

IODINE SOLUTION

Description. The solution usually contains 25 mg of iodine and 25 mg of potassium iodide or sodium iodide equivalent to 25 mg of free iodine and about 44 mg of total iodine in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the containers equivalent to 0.06 g of total iodine and use directly as the test solution.

2. Evaporate half of the volume of the test solution to dryness on a water-bath, ignite gently to volatilize any free iodine and use the residue as the test substance.

Identity tests

Colour and other reactions

1. Dilute 1 drop of the test solution with 10 ml of water and add 1.0 ml of starch TS; a deep blue colour is produced.

2. Dissolve 5 mg of the test substance in 2.0 ml of water and add 5 drops of silver nitrate (40 g/l) TS; a yellow, curdy precipitate is formed which is practically insoluble in ammonia (~100 g/l) TS and in nitric acid (~130 g/l) TS.

3. Dissolve 5 mg of the test substance in 2.0 ml of water, acidify with 0.5 ml of hydrochloric acid (~70 g/l) TS, add 5 drops of ferric chloride (25 g/l) TS and 2.0 ml of chloroform R and shake; the chloroform layer acquires a violet colour.

If the solution contains potassium iodide perform the following test:

4. To 5 mg of the test substance add 1.0 ml of water, shake to dissolve and place 1 drop of this solution on a white tile. Sprinkle a few crystals of sodium cobaltinitrite R on to it; a precipitate or turbidity appears (potassium).

If the solution contains sodium iodide perform the following test:

5. Shake 10 mg of the test substance with 1.0 ml of water, acidify with 1–2 drops of acetic acid (~300 g/l) TS and add 2.0 ml of magnesium uranyl acetate TS or zinc uranyl acetate TS; a light yellow, crystalline precipitate is produced (sodium).

ISONIAZID TABLETS

Description. Each tablet usually contains 100–300 mg of isoniazid.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 0.20 g and 40 mg of isoniazid.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.20 g for test substance 1, divided into 2 equal parts; 40 mg for test substance 2.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 2.0 ml of water, shake and filter. Then add a mixture composed of 1.0 ml of silver nitrate (40 g/l) TS and 1.0 ml of ammonia (~100 g/l) TS; bubbles of nitrogen evolve, the mixture turns from yellow to black and a metallic silver mirror appears on the sides of the test-tube.

2. To 1 part of test substance 1 add 1.0 ml of water and 1.0 ml of sodium hydroxide (~80 g/l) TS and shake; a dense mixture is formed. Then add a few drops of iodine TS; a transient blue colour may be observed, owing to the presence of starch, and bubbles of gas are evolved.

3. Mix test substance 2 with 0.10 g of anhydrous sodium carbonate R, place in a dry test-tube and heat; pyridine, perceptible by its odour, is produced (some pharmaceutical aids used in the formulation may mask the odour).

ISOSORBIDE DINITRATE TABLETS

Description. Each tablet usually contains 5 mg of isosorbide dinitrate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 60 mg of isosorbide dinitrate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance.

Identity tests

Colour and other reactions

1. To the test substance add 6 ml of acetone R, shake and filter. Evaporate the filtrate to dryness on a water-bath and dissolve the residue in 8 ml of water. Keep half of this solution for test 2. To the remaining solution add 1.0 ml of sodium hydroxide (~80 g/l) TS and 0.10 g of zinc R powder and heat on a water-bath for 5 minutes. Cool, filter and to 2.0 ml of the filtrate add 1.0 ml of hydrochloric acid (~70 g/l) TS and 5 drops of sulfanilic acid TS and allow to stand for 5 minutes. Then add 1.0 ml of sodium hydroxide (~80 g/l) TS and 3 drops of 2-naphthol TS; an orange colour is developed.

2. To the solution kept in test 1 add about 0.5 ml of sulfuric acid (~1760 g/l) TS and a few crystals of ferrous sulfate R. Cautiously introduce about 2 ml of sulfuric acid (~1760 g/l) TS to form a lower layer; a brown colour is produced at the interface of the two liquids.

LEVODOPA TABLETS

Description. Each tablet usually contains 250 mg of levodopa.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 0.15 g and 5 mg of levodopa.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.15 g for test substance 1; 5 mg for test substance 2.

Identity tests

Colour and other reactions

1. Shake test substance 1 with 5 ml of hot water. Divide the solution into 2 volumes. To 1 volume add a few drops of ferric chloride (25 g/l) TS; a dark green solution is produced. Keep the remaining volume for test 3.

2. Suspend test substance 2 in 1.0 ml of sulfuric acid (~5 g/l) TS, add 2.0 ml of water and 3 ml of ammonium molybdate (95 g/l) TS and mix; a golden yellow colour appears. Add slowly, while mixing, 2.0 ml of sodium hydroxide (~80 g/l) TS and allow to stand for about 5 minutes; a yellowish red solution is produced.

3. To the solution kept in test 1 add about 0.5 mg of triketohydrindene hydrate R and warm on a water-bath; a blue-violet colour is produced.

LIDOCAINE OINTMENT

Description. The ointment usually contains 20–50 mg of lidocaine per gram of a suitable ointment base.

Preparation of the sample. Withdraw and weigh an amount equivalent to 0.20 g of lidocaine and use directly as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. Dissolve 1 part of the test substance in 2.0 ml of ethanol (~750 g/l) TS, add 2.0 ml of copper(II) sulfate (160 g/l) TS and 1.0 ml of sodium hydroxide (~200 g/l) TS and mix; a strong blue colour is produced.

2. Dissolve 1 part of the test substance in 1.0 ml of ethanol (~750 g/l) TS, add 10 drops of cobalt(II) chloride (30 g/l) TS and shake; a bright green coloured solution and a precipitate are produced.

LIDOCAINE HYDROCHLORIDE INJECTION

Description. The injection is a sterile solution usually containing 4–20 mg of lidocaine hydrochloride in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the ampoules equivalent to 0.30 g of lidocaine hydrochloride and use directly as the test solution, dividing it into 4 equal volumes.

2. Evaporate 2 volumes of the test solution to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. Dissolve the test substance in 10 ml of water. Make the solution just alkaline with sodium hydroxide (~80 g/l) TS using pH-indicator paper R. Collect the precipitate on a small filter, wash it with water and transfer the crystals to a test-tube. Add 1.0 ml of ethanol (~750 g/l) TS and 3-4 drops of cobalt(II) chloride (30 g/l) TS and shake; a blue precipitate is produced, the colour of which gradually changes to green.

2. To 1 volume of the test solution add 3 drops of iodine TS; a brown precipitate is produced.

3. To 1 volume of the test solution add 1.0 ml of nitric acid (~130 g/l) TS and 1.0 ml of silver nitrate (40 g/l) TS; a white precipitate is produced.

LITHIUM CARBONATE CAPSULES

Description. Each capsule usually contains 300 mg of lithium carbonate.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 0.30 g of lithium carbonate.

2. Empty the capsules, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 6 equal parts.

Identity tests

Colour and other reactions

1. To 2 parts of the test substance add 1.0 ml of hydrochloric acid (~70 g/l) TS, shake and filter. Neutralize the filtrate with a few drops of sodium hydroxide (0.1 mol/l) VS, add 2.0 ml of disodium hydrogen phosphate (100 g/l) TS and heat to boiling; a white precipitate is produced.

2. To 2 parts of the test substance add 1.0 ml of sulfuric acid (~100 g/l) TS; effervescence occurs and a colourless gas is evolved which extinguishes a lighted flame.

3. To 1 part of the test substance add 5 ml of water, shake and filter. To the filtrate add 0.25 ml of magnesium sulfate (50 g/l) TS; a fine, white precipitate is formed slowly.

4. Moisten a small amount of the test substance with a few drops of hydrochloric acid (~70 g/l) TS and introduce the mixture into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a carmine-red colour is observed.

LITHIUM CARBONATE TABLETS

Description. Each tablet usually contains 300 mg of lithium carbonate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.30 g of lithium carbonate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 6 equal parts.

Identity tests

Colour and other reactions

1. To 2 parts of the test substance add 1.0 ml of hydrochloric acid (~70 g/l) TS, shake and filter. Neutralize the filtrate with a few drops of sodium hydroxide (0.1 mol/l) VS, add 2.0 ml of disodium hydrogen phosphate (100 g/l) TS and heat to boiling; a white precipitate is produced.

2. To 2 parts of the test substance add 1.0 ml of sulfuric acid (~100 g/l) TS; effervescence occurs and a colourless gas is evolved which extinguishes a lighted flame.

3. To 1 part of the test substance add 5 ml of water, shake and filter. To the filtrate add 0.25 ml of magnesium sulfate (50 g/l) TS; a fine, white precipitate is formed slowly.

4. Moisten a small amount of the test substance with a few drops of hydrochloric acid (~70 g/l) TS and introduce the mixture into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a carmine-red colour is observed.

MANNITOL INJECTION

Description. The injection is a sterile solution usually containing 100–200 mg of mannitol in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the containers equivalent to 2.0 g of mannitol, evaporate to dryness on a water-bath and use the viscous residue as the test substance, dividing it into 4 equal parts.

Identity tests

Melting point. Dry 1 part of the test substance at 105 °C; it melts at about 167 °C.

Colour and other reactions

1. Add 1 part of the test substance to test-tube A containing 2.0 ml of ferric chloride (25 g/l) TS. Add 5 drops of water to test-tube B also containing 2.0 ml of ferric chloride (25 g/l) TS. To both test-tubes add 5 drops of sodium hydroxide (~200 g/l) TS; a brown precipitate is formed in test-tube B and a yellow precipitate is formed in test-tube A. Shake both test-tubes vigorously; a clear solution results in test-tube A, but the precipitate remains in test-tube B. Further addition of sodium hydroxide (~200 g/l) TS does not cause precipitation in test-tube A, but more precipitation takes place in test-tube B.

2. Dissolve 1 part of the test substance in 2.0 ml of water, add 2.0 ml of potassio-cupric tartrate TS and heat the mixture to boiling; no precipitate is formed.

3. Dissolve 1 part of the test substance in 2.0 ml of water and add 1 drop of sodium hydroxide (~80 g/l) TS and 5 drops of potassium permanganate (10 g/l) TS. Heat the mixture to boiling; the colour of the solution disappears. Then add 2.0 ml of potassio-cupric tartrate TS and heat again to boiling; a brick red precipitate is produced.

MEBENDAZOLE TABLETS

Description. Each tablet usually contains 100 mg of mebendazole.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.08 g of mebendazole.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. Shake 1 part of the test substance with 2.0 ml of sodium hydroxide (~80 g/l) TS and heat the yellowish coloured suspension until dissolved; the solution is yellow. Add a few drops of copper(II) sulfate (160 g/l) TS; a greenish precipitate is produced. Add a few drops of ammonia (~100 g/l) TS; the colour of the precipitate turns to greenish blue.

2. To 1 part of the test substance add 2.0 ml of sulfuric acid (~1760 g/l) TS; a yellow solution is produced. Carefully dilute with 3 ml of water; the yellow colour disappears. Filter and add 1.0 ml of silver nitrate (40 g/l) TS; a white precipitate is formed, which does not dissolve in an excess of ammonia (~100 g/l) TS.

METHYLDOPA TABLETS

Description. Each tablet usually contains 250 mg of methyldopa. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amounts equivalent to about 2 mg, 10 mg and 40 mg of methyldopa.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: about 2 mg for test substance 1; 10 mg for test substance 2; 40 mg for test substance 3.

Identity tests

Colour and other reactions

1. To test substance 1 add 3 ml of water and 1 drop of ferric chloride (25 g/l) TS; a green colour is produced. Add 10–20 mg of sodium hydrogen carbonate R; a blue colour is produced which changes to red-violet.

2. Add test substance 2 to a mixture of 1.0 ml of sulfuric acid (~ 5 g/l) TS and 2.0 ml of water; then add 3 ml of ammonium molybdate (95 g/l) TS and mix; a golden yellow colour is produced. While stirring add 2 ml of sodium hydroxide (~200 g/l) TS; a pink colour is produced.

3. To test substance 3 add 5 ml of water and 2.0 ml of potassio-cupric tartrate TS and heat; the colour of the solution turns green and a red precipitate is produced.

METRONIDAZOLE INJECTION

Description. The injection is a sterile solution usually containing 5 mg of metronidazole in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 10 mg of metronidazole and use directly as the test solution, dividing it into 2 equal volumes.

Identity tests

Colour and other reactions

1. To 1 volume of the test solution add 0.05 g of 4-dimethylaminobenzaldehyde R dissolved in 2.0 ml of hydrochloric acid (~70 g/l) TS; a yellowish colour is produced. Add 0.05 g of zinc R powder; the colour changes to red-orange.

2. Boil 1 volume of the test solution with 5 ml of sodium hydroxide (~80 g/l) TS; the solution shows the following colours in turn: pink, pink-violet, red-violet, red, red-brown, yellow-brown, yellow.

METRONIDAZOLE TABLETS

Description. Each tablet usually contains 200–500 mg of metronidazole.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.10 g of metronidazole.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 30 ml of water, filter, evaporate the filtrate to a smaller volume and allow to crystallize. Separate the crystals, dry at 105 °C for 1 hour and use the dried material as the test substance, dividing it into 3 equal parts.

Identity tests

Melting behaviour. The test substance melts at about 160 °C with decomposition.

Colour and other reactions

1. To 1 part of the test substance add 0.05 g of 4-dimethylaminobenzaldehyde R dissolved in 2.0 ml of hydrochloric acid (~70 g/l) TS; a yellowish colour is produced. Add 0.05 g of zinc R powder; the colour changes to red-orange.

2. To 1 part of the test substance add 5 ml of sodium hydroxide (~80 g/l) TS and boil; the solution shows the following colours in turn: pink, pink-violet, red-violet, red, red-brown, yellow-brown, yellow.

NICOTINIC ACID TABLETS

Description. Each tablet usually contains 20–500 mg of nicotinic acid.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of nicotinic acid.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 4 equal parts.

Identity tests

Colour and other reactions

1. To 2.0 ml of water add 2 drops of sodium hydroxide (~80 g/l) TS, 1 drop of phenolphthalein/ethanol TS and small amounts of the test substance until the solution becomes colourless, and filter. To the filtrate add 1 drop of copper(II) sulfate (160 g/l) TS; a light blue precipitate is produced.

2. To 2 parts of the test substance add 10 ml of carbon-dioxide-free water R, shake and filter. Insert a strip of pH-indicator paper R into the filtrate; its coloration indicates a pH of about 3.

3. Heat 1 part of the test substance with 1.0 g of anhydrous sodium carbonate R; pyridine, perceptible by its odour, is produced.

NITRAZEPAM TABLETS

Description. Each tablet usually contains 5–10 mg of nitrazepam.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 10 mg of nitrazepam.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. Mix 1 part of the test substance with 15 ml of hydrochloric acid (~70 g/l) TS, heat on a water-bath for 15 minutes, cool and filter. To the filtrate add 0.20 ml of sodium nitrite (10 g/l) TS, allow to stand for 3 minutes and add 0.10 ml of sulfamic acid (100 g/l) TS. Allow to stand once more for 3 minutes, then add 0.20 ml of 2-naphthol TS; an orange-red colour is produced.

2. To 1 part of the test substance add 1.0 ml of methanol R and 0.10 ml of sodium hydroxide (~80 g/l) TS; a bright yellow colour is produced.

NITROFURANTOIN TABLETS

Description. Each tablet usually contains 100 mg of nitrofurantoin.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 20 mg and about 2 mg of nitrofurantoin.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 20 mg for test substance 1; about 2 mg for test substance 2, divided into 2 equal parts.

Identity tests

Colour and other reactions

1. Suspend test substance 1 in a mixture of 5 ml of sodium hydroxide (~80 g/l) TS and 5 ml of water; an orange-red solution is produced which changes to dark brown.

2. To 1 part of test substance 2 add 1.0 ml of dimethylformamide R and 2 drops of potassium hydroxide/ethanol TS and shake; a brown colour is produced.

3. Mix 1 part of test substance 2 with about 2 ml of sulfuric acid (~1760 g/l) TS; a light yellow colour is produced. Add 10 mg of resorcinol R; the colour changes to strong yellow, then orange and finally to brown.

NORETHISTERONE TABLETS

Description. Each tablet usually contains 0.35–5 mg of norethisterone.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 50 mg of norethisterone.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add about 2 ml of sulfuric acid (~1760 g/l) TS; a reddish brown solution is produced. Very cautiously dilute the solution

with 10 ml of water; the colour changes to yellow and a brownish yellow precipitate is produced.

2. To 1 part of the test substance add about 1 ml of phosphoric acid (~1440 g/l) TS and heat cautiously; a yellow colour is produced which changes after a while to green and then to cherry red.

3. Transfer 3 parts of the test substance to a test-tube, add a mixture of 0.5 ml of potassium hydroxide/ethanol TS and 1.5 ml of ethanol (~750 g/l) TS and heat in a water-bath for 5 minutes. Cool, cautiously add 1.0 ml of water and about 1 ml of sulfuric acid (~1760 g/l) TS and boil gently for about 1 minute; no odour of ethyl acetate is perceptible.

NYSTATIN TABLETS

Description. Each tablet usually contains 500 000 IU equivalent to 100 mg of nystatin. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.16 g of nystatin.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add about 2 ml of sulfuric acid (~1760 g/l) TS; a brown-violet colour is produced.

2. To 1 part of the test substance add 1.0 ml of ethanol (~750 g/l) TS and about 1 ml of hydrochloric acid (~250 g/l) TS, shake and filter. To the filtrate add a few crystals of resorcinol R, and heat on a water-bath for 2 minutes; an orange to reddish brown colour is produced.

3. To 1 part of the test substance add 2.0 ml of ethanol (~750 g/l) TS, shake and filter. To the filtrate add about 1 ml of hydrochloric acid (~250 g/l) TS and 2 drops of a solution composed of 1.0 ml of ferric chloride (25 g/l) TS and 10 ml of water; the yellow colour of the solution becomes more intense.

OXYTETRACYCLINE HYDROCHLORIDE CAPSULES

Description. Each capsule usually contains 250 mg of oxytetracycline hydrochloride.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 0.10 g of oxytetracycline hydrochloride.

2. Empty the capsules, weigh out the above-calculated equivalent amount, shake with 10 ml of water, filter, and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. Add 2 drops of the test solution to about 2 ml of sulfuric acid (~1760 g/l) TS; a red-violet colour is produced which remains for more than 2 minutes. Allow to stand for 5 minutes then cautiously add 2.0 ml of water; a yellow colour is produced.

2. Warm 2.0 ml of zinc chloride (500 g/l) TS in a porcelain dish until a skin forms on the surface of the solution. Then add 2 drops of the test solution and continue to warm for 1 minute; a grey-green to violet-brown colour is produced.

3. To 1.0 ml of the test solution add 5 drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

PARACETAMOL TABLETS

Description. Each tablet usually contains 100–500 mg of paracetamol.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.5 g of paracetamol.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 20 ml of hot ethanol (~750 g/l) TS, filter, evaporate the filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Melting point. The test substance melts at about 170 °C.

Colour and other reactions

1. Dissolve 0.10 g of the test substance in 10 ml of water and add 0.5 ml of ferric chloride (25 g/l) TS; an intense blue colour is produced.

2. To 0.10 g of the test substance add about 2 ml of hydrochloric acid (~250 g/l) TS and heat to boiling for 1 minute. Then add 10 ml of water and 1 drop of potassium dichromate (100 g/l) TS and shake; a violet colour slowly develops and does not become red (distinction from phenacetin).

3. Dissolve 35 mg of the test substance in 2.0 ml of ethanol (~750 g/l) TS and add 2 ml of 4-dimethylaminobenzaldehyde TS; the solution remains almost colourless. Heat the solution in a water-bath for 5 minutes; a yellow colour is produced.

PENICILLAMINE CAPSULES

Description. Each capsule usually contains 250 mg of penicillamine.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 40 mg of penicillamine.

2. Empty the capsules, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 4 equal parts.

Identity tests

Colour and other reactions

1. To 2 parts of the test substance add 10 ml of water, 5 drops of sodium hydroxide (~80 g/l) TS and 20 mg of triketohydrindene hydrate R and shake; a dark violet-red colour is produced.

2. To 1 part of the test substance add 5 ml of water and 0.5 ml of ferric chloride (25 g/l) TS and shake; an intense blue colour is produced which fades quickly and becomes colourless.

3. To 1 part of the test substance add 5 ml of water and 5 drops of copper(II) sulfate (160 g/l) TS and shake; a dark brown-black colour is produced. Add a few additional drops of copper(II) sulfate (160 g/l) TS and allow to stand for not less than 10 minutes; the colour of the solution turns to dark green.

PETHIDINE HYDROCHLORIDE INJECTION

Description. The injection is a sterile solution usually containing 50 mg of pethidine hydrochloride in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the ampoules equivalent to 0.50 g and 50 mg of pethidine hydrochloride and use directly: 0.50 g for test solution 1; 50 mg for test solution 2.

2. Evaporate test solution 1 to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. Dissolve about 1 mg of the test substance in 1 ml of formaldehyde/sulfuric acid TS and heat cautiously; the colour of the solution turns pink changing to violet-red and showing a red fluorescence when held in front of a strong light.

2. Dissolve the remaining test substance in 5 ml of ethanol (~750 g/l) TS, add 5 ml of trinitrophenol/ethanol TS and shake; a yellow, crystalline precipitate is produced. Filter, wash with water and dry the crystals at 105 °C for 2 hours; melting point, about 190 °C.

3. To test solution 2 add 5 ml of water, acidify with 1.0 ml of nitric acid (~130 g/l) TS and add a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

PHENOBARBITAL TABLETS

Description. Each tablet usually contains 15–100 mg of phenobarbital.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.5 g of phenobarbital.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as test substance 1, dividing it into 5 equal parts.

3. Shake 4 parts of test substance 1 with 10 ml of dehydrated ethanol R, filter, evaporate the filtrate to dryness and use the residue as test substance 2.

4. Suspend 1 part of test substance 1 in 5 ml of ethanol (~750 g/l) TS, place a strip of filter-paper into it and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Melting point. Test substance 2 melts at about 174 °C.

Heating behaviour. Heat a small amount of test substance 2; a colourless melt is obtained, which has a characteristic odour, and white fumes are developed. When inflamed, it burns with a strong luminous flame. When ignited, the residue has a yellowish brown colour that turns finally to black.

Colour and other reactions

1. Dissolve 20 mg of test substance 2 in 5 ml of methanol R, add 1 drop of cobalt(II) chloride (30 g/l) TS and 3–4 drops of ammonia (~100 g/l) TS; a violet colour is produced.

   Alternative test by filter-paper technique:
   On the test paper place 1 drop of cobalt(II) chloride (30 g/l) TS, followed by 1 drop of ammonia (~100 g/l) TS; a yellowish spot with a violet border is produced.

2. Dissolve 0.10 g of test substance 2 in a mixture of 5 ml of water and 0.5 ml of sodium hydroxide (~80 g/l) TS, filter and then add 1.0 ml of citric acid (90 g/l) TS; a white, voluminous precipitate is produced (distinction from barbital).

3. Using heat dissolve 10 mg of test substance 2 in 10 ml of water. Cool and pour into a mixture composed of 0.5 ml of potassium bromate (15 g/l) TS, 0.05 g of potassium bromide R, 1.0 ml of hydrochloric acid (~70 g/l) TS and 5 ml of water. Shake; a stable reddish yellow colour is obtained (distinction from hexobarbital).

4. To 0.20 g of test substance 2 add about 2 ml of sulfuric acid (~1760 g/l) TS, 20 mg of sodium nitrate R and allow to stand for 30 minutes; a yellow colour is produced.

PHENOXYMETHYLPENICILLIN POTASSIUM TABLETS

Description. Each tablet contains phenoxymethylpenicillin potassium usually equivalent to 250 mg of phenoxymethylpenicillin.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 60 mg of phenoxymethylpenicillin.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 6 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 3 ml of water, shake and filter. To the filtrate add 0.10 g of hydroxylamine hydrochloride R and about 0.5 ml of sodium hydroxide (~80 g/l) TS, shake and allow to stand for 5 minutes. Then add 1.3 ml of hydrochloric acid (~70 g/l) TS and 0.5 ml of ferric chloride (25 g/l) TS; a violet-red colour is produced.

2. To 1 part of the test substance add a few drops of ethanol (~750 g/l) TS and 1.0 ml of water, shake and filter. To the filtrate add 1–2 drops of ferric chloride (25 g/l) TS; a light yellow precipitate is produced.

3. To 10 mg of paraformaldehyde R dissolved in about 1 ml of sulfuric acid (~1760 g/l) TS add a small amount of the test substance; a cherry red colour is produced. Heat the solution in a water-bath for 2 minutes; the colour of the solution changes to dark red.

4. To 3 parts of the test substance add 2.0 ml of water and 2–3 drops of glacial acetic acid R, shake and filter. To the filtrate add 1.0 ml of sodium cobaltinitrite (100 g/l) TS; an orange-yellow precipitate is produced.

PHENYTOIN SODIUM TABLETS

Description. Each tablet usually contains 25–100 mg of phenytoin sodium. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.08 g of phenytoin sodium.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 4 ml of chloroform R and 0.10 ml of cobalt(II) chloride (30 g/l) TS and shake; a voluminous precipitate is produced in a blue-violet coloured solution (distinction from phenytoin).

2. To 1 part of the test substance add 2.0 ml of ammonia (~100 g/l) TS and heat until boiling begins. Add 1 drop of copper(II) sulfate (160 g/l) TS and shake; a blue-violet solution with a blue-green precipitate is produced. Allow to stand for 3 minutes, filter and wash with water; pink needles remain on the filter.

PREDNISOLONE TABLETS

Description. Each tablet usually contains 1.0–5.0 mg of prednisolone.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.10 g of prednisolone.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 25 ml of chloroform R and filter. Evaporate the filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. To about 2 mg of the test substance add about 1 ml of phosphoric acid (~1440 g/l) TS and heat cautiously; the following colours are observed in turn: yellow, green, orange and reddish brown.

2. To 0.05 g of the test substance add 0.5 ml of potassium hydroxide/ethanol TS and 1.5 ml of ethanol (~750 g/l) TS and heat in a water-bath for 5 minutes. Cool, cautiously add 1.0 ml of water and 1 ml of sulfuric acid (~1760 g/l) TS and heat gently for 1 minute; no odour of ethyl acetate is perceptible (distinction from prednisolone acetate).

3. To 5 mg of the test substance add 1.0 ml of ethanol (~750 g/l) TS and shake. Then add 1.0 ml of potassio-cupric tartrate TS and heat to boiling; an orange precipitate is produced slowly.

PRIMAQUINE DIPHOSPHATE TABLETS

Description. Each tablet contains primaquine diphosphate usually equivalent to 7.5–15 mg of primaquine. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.05 g of primaquine.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, suspend it in 6 ml of water and filter. Place 2 strips of filter-paper into the filtrate and allow the solution to ascend for about 4 cm. Take out the strips, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strips in air at room temperature (test papers). Keep the remaining filtrate as the test solution.

Identity tests

Colour and other reactions

1. On a test paper place 1 drop of ceric ammonium sulfate/nitric acid TS; a deep

violet spot is produced which gradually disappears (distinction from chloroquine).

2. On a test paper place 1 drop of gold chloride TS; a violet spot is produced at once.

3. To the test solution add 2.0 ml of sodium hydroxide (~80 g/l) TS and filter. Neutralize the filtrate with sulfuric acid (~100 g/l) TS and add 10 ml of ammonium molybdate (95 g/l) TS; a yellowish precipitate is produced which is soluble in ammonia (~100 g/l) TS and in nitric acid (~130 g/l) TS.

PROCAINAMIDE HYDROCHLORIDE INJECTION

Description. The injection is a sterile solution usually containing 100 mg of procainamide hydrochloride in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 100 mg of procainamide hydrochloride and use directly as the test solution.

Identity tests

Colour and other reactions

1. To about 0.1 ml of the test solution add 1.0 ml of water, 5 drops of hydrochloric acid (~70 g/l) TS and 10 drops of sodium nitrite (10 g/l) TS, and allow to stand for a few minutes. Then add 1.0 ml of sodium hydroxide (~80 g/l) TS and 5 mg of 2-naphthol R; an orange-red solution and a red precipitate are produced.

2. Dilute about 0.7 ml of the test solution to 1.0 ml with water, add 1.0 ml of potassium ferrocyanide (45 g/l) TS and 0.5 ml of hydrochloric acid (~70 g/l) TS and heat to boiling; a dark green precipitate is produced.

3. To about 0.1 ml of the test solution add 2.0 ml of water, and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced which is insoluble in nitric acid (~130 g/l) TS but soluble in an excess of ammonia(~100 g/l) TS.

PROCAINAMIDE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 250–500 mg of procainamide hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amounts equivalent to 20 mg and 0.07 g of procainamide hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: 20 mg for test substance 1, divided into 2 equal parts; 0.07 g for test substance 2.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 1.0 ml of water, 5 drops of hydrochloric acid (~70 g/l) TS, 0.5 ml of sodium nitrite (10 g/l) TS, 1.0 ml of sodium hydroxide (~80 g/l) TS and 5 mg of 2-naphthol R; an orange-red solution and a red precipitate are produced.

2. To test substance 2 add 1.0 ml of water, 1.0 ml of potassium ferrocyanide (45 g/l) TS and 0.5 ml of hydrochloric acid (~70 g/l) TS, and heat to boiling; a dark green precipitate is produced.

3. To 1 part of test substance 1 add 2.0 ml of water, shake and filter. To the filtrate add a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced, which is insoluble in nitric acid (~130 g/l) TS, but soluble in an excess of ammonia (~100 g/l) TS.

PROMETHAZINE HYDROCHLORIDE INJECTION

Description. The injection is a sterile solution usually containing 25 mg of promethazine hydrochloride in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 30 mg of promethazine hydrochloride and use directly as the test solution, dividing it into 3 equal volumes.

Identity tests

Colour and other reactions

1. Evaporate 1 volume of the test solution to dryness on a water-bath, dissolve the residue in 5 ml of sulfuric acid (~1760 g/l) TS and allow to stand for 5 minutes; a red colour is produced. Add a few drops of potassium dichromate (100 g/l) TS; the solution fades, becoming almost colourless (distinction from promazine).

2. Shake 1 volume of the test solution with 5 ml of chloroform R, filter and to the filtrate add 1.0 ml of sodium metaperiodate (60 g/l) TS and 2.0 ml of sulfuric acid (~100 g/l) TS. Shake vigorously and allow the layers to separate; the aqueous layer remains colourless whereas the chloroform layer shows a dark green colour (distinction from chlorpromazine).

3. To 1 volume of the test solution add 5 ml of water, shake well and filter. To the filtrate add 4–5 drops of nitric acid (~1000 g/l) TS; a dark red colour is

produced which suddenly fades to almost colourless. Add 2.0 ml of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

PROMETHAZINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 10–25 mg of promethazine hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 30 mg of promethazine hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

3. Shake 1 part of the test substance with 5 ml of chloroform R, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 5 ml of sulfuric acid (~1760 g/l) TS and allow to stand for 5 minutes; a red colour is produced. Add a few drops of potassium dichromate (100 g/l) TS; the solution fades, becoming almost colourless (distinction from promazine).

2. To the test solution add 1.0 ml of sodium metaperiodate (60 g/l) TS and 2.0 ml of sulfuric acid (~100 g/l) TS. Shake vigorously and allow the layers to separate; the aqueous layer remains colourless whereas the chloroform layer shows a dark green colour (distinction from chlorpromazine).

3. To 1 part of the test substance add 5 ml of water, shake well and filter. To the filtrate add 4–5 drops of nitric acid (~1000 g/l) TS; a dark red colour is produced which suddenly fades to almost colourless. Add 2.0 ml of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced.

PROPRANOLOL HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 10–80 mg of propranolol hydrochloride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of propranolol hydrochloride.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, triturate it with 10 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. Evaporate 1 drop of the test solution to dryness on a water-bath and to the residue add 1 drop of fuming nitric acid R; a deep purple colour is produced. Evaporate again to dryness; a greenish yellow colour is obtained. Moisten the residue with freshly prepared potassium hydroxide/ethanol TS; the colour of the mixture changes to orange.

2. To 2.0 ml of the test solution add 1–2 drops of nitric acid (~130 g/l) TS and 4–5 drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is obtained which, after being well washed with water, is soluble in ammonia (~100 g/l) TS.

3. Render the remaining test solution alkaline with sodium hydroxide (~200 g/l) TS and extract it with three quantities, each of 10 ml, of chloroform R. Wash the combined extracts with water until the washings are free from alkali. Dry the chloroform extracts with anhydrous sodium sulfate R, filter and evaporate the filtrate to dryness. Dry the residue under reduced pressure at 50 °C for 1 hour; melting point, about 94 °C.

PROPYLTHIOURACIL TABLETS

Description. Each tablet usually contains 50 mg of propylthiouracil.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 60 mg of propylthiouracil.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 6 equal parts.

Identity tests

Colour and other reactions

1. Shake 2 parts of the test substance with 2.0 ml of ammonia (~100 g/l) TS and filter. To the filtrate add 1.0 ml of silver nitrate (40 g/l) TS; a greyish white gel is produced.

2. Shake 1 part of the test substance with 2.0 ml of water and filter. To the filtrate add 3 drops of copper(II) sulfate (160 g/l) TS; a green solution and a white to greyish precipitate are produced.

3. To 3 parts of the test substance add 10 ml of ethanol (~750 g/l) TS, filter and evaporate the filtrate to dryness on a water-bath. To the residue add 6–8 ml of bromine TS, shake for a few minutes and warm until the colour disappears. Cool and filter. To the filtrate add 2.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced which, on the addition of 2.0 ml of sodium hydroxide (~150 g/l) TS, does not turn violet (distinction from thiouracil).

PYRANTEL EMBONATE TABLETS

Description. Each tablet contains pyrantel embonate usually equivalent to 250 mg of pyrantel.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of pyrantel.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with a mixture composed of 10 ml of chloroform R, 10 ml of methanol R and 1 ml of ammonia (~260 g/l) TS and filter. Evaporate the filtrate to dryness on a water-bath and recrystallize from a small volume of methanol R. Dry the separated crystals at 80 °C for 2 hours and use as the test substance.

Identity tests

Melting behaviour. About 251 °C.

Colour and other reactions

1. Dissolve 5 mg of the test substance in 1.0 ml of hydrochloric acid (~70 g/l) TS and add 1.0 ml of formaldehyde/sulfuric acid TS; a purple colour is produced.

2. To 5 mg of the test substance add 1.0 ml of sodium hydroxide (~80 g/l) TS and 2.0 ml of potassium permanganate (10 g/l) TS; a green solution is obtained from which, after boiling, a brown precipitate separates.

3. Dissolve about 2 mg of the test substance in 2 ml of sulfuric acid (~1760 g/l) TS; a yellow colour is produced which changes to orange and finally to red.

PYRAZINAMIDE TABLETS

Description. Each tablet usually contains 500 mg of pyrazinamide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 0.18 g and 10 mg of pyrazinamide.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.18 g for test substance 1, divided into 3 equal parts; 10 mg for test substance 2.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 5 ml of sodium hydroxide (~80 g/l) TS and heat in a water-bath; vapours are evolved. Insert moistened pH-indicator paper R into the vapours; its coloration is changed to an alkaline range, and an odour of ammonia is perceptible.

2. To 2 parts of test substance 1 add 5 ml of water, heat gently and add 1.0 ml of ferrous sulfate (15 g/l) TS; an orange colour is produced. Add a few drops of sodium hydroxide (~80 g/l) TS; the colour changes to dark blue.

3. To test substance 2 add 1.0 ml of 4-dimethylaminobenzaldehyde TS and heat on a water-bath; a bright yellow colour is produced.

PYRIDOXINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 25 mg of pyridoxine hydrochloride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 30 mg of pyridoxine hydrochloride.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

3. Shake 2 parts of the test substance with 5 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 1.0 ml of the test solution add 1.0 ml of ferric chloride (25 g/l) TS; a red-brown colour is produced. Add 2.0 ml of hydrochloric acid (~70 g/l) TS; the colour of the solution turns to yellow.

2. To 0.5 ml of sulfanilic acid TS add 3 drops of sodium nitrite (10 g/l) TS, 1.0 ml of sodium hydroxide (~80 g/l) TS and 1 part of the test substance; a

golden yellow colour appears after 2 minutes. Add 2 ml of acetic acid (~300 g/l) TS; the colour of the solution turns to orange.

3. To 2.0 ml of the test solution add 0.5 ml of nitric acid (~130 g/l) TS and 1.0 ml of silver nitrate (40 g/l) TS; a white precipitate is produced. Add 3–4 ml of ammonia (~100 g/l) TS; the precipitate dissolves.

QUINIDINE SULFATE TABLETS

Description. Each tablet usually contains 200 mg of quinidine sulfate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 150 mg of quinidine sulfate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

3. Shake 2 parts of the test substance with 10 ml of water, filter and use the filtrate as the test solution.

4. Suspend 1 part of the test substance in 5 ml of ethanol (~750 g/l) TS, place a strip of filter-paper into the suspension and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Colour and other reactions

1. The test solution produces a slight blue fluorescence. To 1.0 ml of the test solution add a few drops of sulfuric acid (~100 g/l) TS and dilute to 5 ml with water; in ultraviolet light (254 nm) a vivid blue fluorescence is observed.

   Alternative test by filter-paper technique:
   On the test paper place 1 drop of sulfuric acid (~100 g/l) TS and observe it in ultraviolet light (254 nm); a vivid blue fluorescent spot is produced.

2. To about 0.5 ml of the test solution add 4 ml of water, 1 drop of bromine TS and 1.0 ml of ammonia (~100 g/l) TS; a bluish green solution is slowly produced.

3. To 3 ml of the test solution add 5 ml of water and 0.10 g of potassium iodide R and shake; a white precipitate is formed (distinction from quinine).

4. To 3 ml of the test solution add 0.5 g of potassium sodium tartrate R and shake; the solution remains unchanged (distinction from quinine).

5. To 1.0 ml of the test solution add a few drops of hydrochloric acid (~70 g/l) TS and 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

QUININE SULFATE TABLETS

Description. Each tablet contains quinine sulfate usually equivalent to 300 mg of quinine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.06 g of quinine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 30 ml of water, filter, and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 5 ml of the test solution add 2 drops of sulfuric acid (~100 g/l) TS; a blue fluorescence is produced.

2. To 5 ml of the test solution add, drop by drop, bromine TS until a light yellow colour persists and then add 1.0 ml of ammonia (~100 g/l) TS; an emerald green colour is produced.

3. To 5 ml of the test solution add 1.0 ml of hydrochloric acid (~70 g/l) TS and 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

RESERPINE TABLETS

Description. Each tablet usually contains 100–250 µg of reserpine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 3 mg of reserpine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. Mix 1 part of the test substance with 5 mg of 4-dimethylaminobenzaldehyde R and 4 drops of glacial acetic acid R. Then add 4 drops of sulfuric acid

(~1760 g/l) TS; a green colour is produced. Add about 1 ml of glacial acetic acid R; the colour turns to red.

2. Suspend 2 parts of the test substance in 3.0 ml of ethanol (~750 g/l) TS, shake and filter. To the filtrate add 1 drop of sulfuric acid (~100 g/l) TS and a few drops of sodium nitrite (10 g/l) TS; the solution slowly becomes yellowish green in colour and has a greenish fluorescence.

RETINOL ORAL SOLUTION

Description. The solution usually contains retinol acetate or retinol palmitate in a suitable vegetable oil, equivalent to 30 mg or 100 000 IU of retinol per ml.

Preparation of the sample. Pool the contents of the containers equivalent to 5 mg of retinol acetate or retinol palmitate and use directly as the test solution.

Identity tests

Colour and other reactions

1. To about 2 ml of sulfuric acid (~1760 g/l) TS add 1 drop of the test solution; a deep purple colour is produced. Allow to stand for a few minutes; the colour changes to wine-red.

2. Mix 1 drop of the test solution with 5 ml of chloroform R, add about 0.5 ml of acetic anhydride R and 2 drops of sulfuric acid (~1760 g/l) TS and shake well; the yellowish colour of the solution changes to dark blue.

RIBOFLAVIN TABLETS

Description. Each tablet usually contains 5 mg of riboflavin. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 25 mg of riboflavin.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 5 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 10 ml of hot water and shake; a yellow suspension is produced with a green fluorescence. Add a few drops of

hydrochloric acid (~70 g/l) TS or a few drops of sodium hydroxide (~80 g/l) TS; the fluorescence disappears.

2. To 3 parts of the test substance add about 2 ml of sulfuric acid (~1760 g/l) TS and shake; a deep red colour is produced.

3. To 1 part of the test substance add 2.0 ml of silver nitrate (40 g/l) TS; after a few minutes an orange colour is produced. Allow to stand for a few hours; a red precipitate is produced.

RIFAMPICIN CAPSULES

Description. Each capsule usually contains 150–300 mg of rifampicin.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 20 mg of rifampicin.

2. Empty the capsule, weigh out the above-calculated equivalent amount, shake it with 10 ml of dehydrated ethanol R, filter, evaporate the filtrate to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. To about 1 mg of the test substance add 3 ml of water and 3 drops of copper(II) sulfate (160 g/l) TS, shake and heat to boiling; a violet colour is produced.

2. To about 1 mg of the test substance add about 2 ml of sulfuric acid (~1760 g/l) TS; an orange colour is produced. Heat on a water-bath for 2 minutes; the colour turns to dark red.

3. To 5 mg of the test substance add about 1 ml of pyridine R, 1.0 ml of sodium hydroxide (~80 g/l) TS and 2 drops of benzenesulfonyl chloride R and shake well; a dark red-violet colour is observed.

SALBUTAMOL SULFATE INHALATION (AEROSOL)

Description. The inhalation, supplied in a pressurized canister, contains a fine suspension of salbutamol sulfate in a suitable propellant, usually equivalent to 100 µg per dose.

Preparation of the sample. From the label, calculate the volume of suspension equivalent to 10 mg of salbutamol. Expel and pool it, shake with 8 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 2 ml of the test solution add about 0.1 ml of ferric chloride (25 g/l) TS; an orange colour develops. Add 10 mg of sodium hydrogen carbonate R; a fleshy precipitate is produced with an evolution of gas. Add 1–2 drops of sulfuric acid (~1760 g/l) TS; the solution becomes colourless.

2. To 2 ml of the test solution add 2–3 drops of sulfuric acid (~100 g/l) TS; a yellow colour is produced. Add 2–3 drops of potassium permanganate (10 g/l) TS; the purple colour is discharged.

3. To 2 ml of the test solution add 1.0 ml of hydrochloric acid (~70 g/l) TS and 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

SALBUTAMOL SULFATE PESSARIES

Description. Each pessary contains salbutamol sulfate usually equivalent to 1.0–4.0 mg of salbutamol.

Preparation of the sample

1. Weigh 1 pessary and calculate the amount equivalent to 25 mg of salbutamol.

2. Grind the pessaries, weigh out the above-calculated equivalent amount as powdered material and shake it with 10 ml of water and 50 ml of light petroleum R. Separate the aqueous layer, wash it once with 20 ml of chloroform R and use the aqueous layer as the test solution.

Identity tests

Colour and other reactions

1. To 4 ml of the test solution add about 0.1 ml of ferric chloride (25 g/l) TS; a reddish violet colour develops. Add 10 mg of sodium hydrogen carbonate R; a fleshy precipitate is produced with an evolution of gas. Add 1–2 drops of sulfuric acid (~1760 g/l) TS; the solution becomes colourless.

2. To 2.0 ml of the test solution add 1.0 ml of hydrochloric acid (~70 g/l) TS and 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

3. To 2.0 ml of the test solution add 2–3 drops of sulfuric acid (~100 g/l) TS and 2–3 drops of potassium permanganate (10 g/l) TS; the purple colour is discharged.

SALBUTAMOL SULFATE SYRUP

Description. The syrup contains salbutamol sulfate usually equivalent to 400 µg of salbutamol in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the well-homogenized contents of the containers equivalent to 5.0 mg of salbutamol and use directly as the test solution, dividing it into 5 equal volumes.

Identity tests

Colour and other reactions

1. To 2 volumes of the test solution add 1.0 ml of ammonia (~100 g/l) TS and 0.5 g of sodium chloride R. Extract twice with 5.0 ml of chloroform R. Pass both chloroform extracts through anhydrous sodium sulfate R, and evaporate to reduce to a volume of about 2–3 ml. Then add 1 ml of water and about 0.1 ml of ferric chloride (25 g/l) TS and shake vigorously; a violet-coloured ring is produced in the aqueous phase, whereas the chloroform layer remains colourless.

2. To 1 volume of the test solution add 2–3 drops of sulfuric acid (~100 g/l) TS and 2–3 drops of potassium permanganate (10 g/l) TS; the purple colour is discharged.

3. To 2 volumes of the test solution add 1.0 ml of hydrochloric acid (~70 g/l) TS and 1.0 ml of barium chloride (50 g/l) TS; a white turbidity is produced.

SALBUTAMOL SULFATE TABLETS

Description. Each tablet contains salbutamol sulfate usually equivalent to 2.0–4.0 mg of salbutamol.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 25 mg of salbutamol.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 4 ml of the test solution add about 0.1 ml of ferric chloride (25 g/l) TS; a reddish violet colour develops. Add 10 mg of sodium hydrogen carbonate R; a fleshy precipitate is produced and a gas is evolved. Add 1–2 drops of sulfuric acid (~1760 g/l) TS; the solution becomes colourless.

2. To 2.0 ml of the test solution add 1.0 ml of hydrochloric acid (~70 g/l) TS and 1.0 ml of barium chloride (50 g/l) TS; a white precipitate is produced.

3. To 2.0 ml of the test solution add 2–3 drops of sulfuric acid (~100 g/l) TS and 2–3 drops of potassium permanganate (10 g/l) TS; the purple colour is discharged.

SALICYLIC ACID LOTION

Description. The lotion usually contains 50 mg of salicylic acid in 1.0 ml of a suitable vehicle.

Preparation of the sample

1. Pool the contents of the containers equivalent to 0.50 g of salicylic acid and use directly as the test solution, dividing it into 5 equal volumes.
2. Evaporate 2 volumes of the test solution to dryness in a current of air and use the residue as the test substance.
3. Place a strip of filter-paper into 2 volumes of the test solution and allow the solution to ascend for about 4 cm. Take out the strip, cut away the lower dipped portion as well as the part that has not been wetted by the solution and dry the remaining part of the strip in air at room temperature (test paper).

Identity tests

Heating behaviour. Heat the test substance in a dry test-tube; the substance melts, sublimes (collect the sublimate) and finally boils; the initial pungent odour changes to an intense phenolic odour.

Melting point of the sublimate. About 158 °C.

Colour and other reactions

To half of 1 volume of the test solution add 5 ml of water and warm gently. Insert a strip of pH-indicator paper R into the solution; its coloration is changed to an acidic range. To the cooled solution add a few drops of ferric chloride (25 g/l) TS; a dark violet colour is produced.

Alternative test by filter-paper technique:
On the test paper place 1 drop of ferric chloride (25 g/l) TS; a strong violet spot is produced.

SODIUM CITRATE ORAL SOLUTION

Description. The solution contains sodium citrate in a suitable vehicle usually equivalent to 0.3 mol/l.

Preparation of the sample. Pool the contents of the containers equivalent to about 0.3 g of sodium citrate and use directly as the test solution.

Identity tests

Colour and other reactions

1. Introduce the test solution into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a strong yellow colour is observed.

2. Acidify 2.0 ml of the test solution with acetic acid (~300 g/l) TS, add 2.0 ml of magnesium uranyl acetate TS or zinc uranyl acetate TS and scratch the sides of the tube to induce crystallization; a light yellow, crystalline precipitate is produced.

3. To 5 ml of the test solution add 3 ml of mercuric chloride (65 g/l) TS and heat to boiling. While boiling add a few drops of potassium permanganate (10 g/l) TS; the violet colour is immediately discharged and a white precipitate is produced.

4. The test solution is alkaline when tested with pH-indicator paper R.

SODIUM FLUORIDE TABLETS

Description. Each tablet usually contains 500 µg of sodium fluoride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 15 mg of sodium fluoride.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. Shake 1 part of the test substance with 10 ml of water and filter. In separate vessels, dilute 2.0 ml of ferric chloride (25 g/l) TS to 50 ml with water and dilute 1 ml of ammonium thiocyanate (75 g/l) TS to 10 ml with water. Mix 1.0 ml of each of the diluted solutions with 5 drops of hydrochloric acid (~70 g/l) TS; a red solution is produced. Gradually add the test solution to the reagent mixture; its colour is changed to yellow.

2. Shake 2 parts of the test substance with 20 ml of water and filter. Evaporate the filtrate on a water-bath to a volume of about 5 ml. Cool and add 1.0 ml of nitric acid (~130 g/l) TS and 1.0 ml of silver nitrate (40 g/l) TS; the solution remains unchanged (distinction from other halides).

SODIUM HYDROGEN CARBONATE TABLETS

Description. Each tablet usually contains 325–650 mg of sodium hydrogen carbonate.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of sodium hydrogen carbonate.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance. Keep a small amount of the test substance for test 1 and divide the remaining material into 2 equal parts.

Identity tests

Colour and other reactions

1. Moisten the small amount of test substance set aside with a few drops of hydrochloric acid (~70 g/l) TS and introduce it into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a bright yellow colour appears in the flame.

2. To 1 part of the test substance add 5 ml of water and 2 drops of phenolphthalein/ethanol TS; a pink colour is produced. Heat to boiling; a gas is evolved and the colour of the solution turns to red-violet.

3. To 1 part of the test substance add about 1 ml of acetic acid (~300 g/l) TS; a gas evolves which is colourless and odourless. Pass the generated gas into 5 ml of calcium hydroxide TS; a white precipitate is formed immediately.

SODIUM NITRITE INJECTION

Description. The injection is a sterile solution usually containing 30 mg of sodium nitrite in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 0.3 g of sodium nitrite and use directly as the test solution, dividing it into 4 equal volumes.

Identity tests

Colour and other reactions

1. Introduce the test solution into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a strong yellow colour is observed.

2. Acidify 1 volume of the test solution with acetic acid (~300 g/l) TS and add 2.0 ml of magnesium uranyl acetate TS or zinc uranyl acetate TS; a light yellow, crystalline precipitate is produced.

3. To 1 volume of the test solution add 20 mg of ferrous sulfate R and 1.0 ml of sulfuric acid (~100 g/l) TS; a gas is evolved and the solution acquires a strong brown-green colour.

4. To 1 volume of the test solution add 2.0 ml of hydrochloric acid (~70 g/l) TS; nitrous vapours are produced.

5. The test solution is neutral when tested with pH-indicator paper R.

SODIUM NITROPRUSSIDE SOLUBLE POWDER

Description. Each vial contains a sterile powder usually equivalent to 50 mg of sodium nitroprusside.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amount equivalent to 30 mg of sodium nitroprusside.

2. Empty the vial, weigh out the above-calculated equivalent amount and use directly as the test substance, dividing it into 3 equal parts.

Identity tests

Colour and other reactions

1. Dissolve 1 part of the test substance in 4 ml of water, add 4 drops of acetone R and 1.0 ml of sodium hydroxide (~80 g/l) TS; an orange colour is produced. Then add 4 ml of acetic acid (~300 g/l) TS; the colour turns to purple.

2. Dissolve 1 part of the test substance in 10 ml of water, add 1.0 ml of nitric acid (~130 g/l) TS and 1.0 ml of silver nitrate (40 g/l) TS; a light pink, flocculent precipitate is produced.

3. Introduce a small quantity of the test substance moistened with hydrochloric acid (~250 g/l) TS into a nonluminous flame using a nichrome or platinum wire sealed to a glass rod; a strong yellow colour is observed.

SODIUM VALPROATE TABLETS

Description. Each tablet usually contains 200–500 mg of sodium valproate. The tablets may be sugar-coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.40 g of sodium valproate.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, add 5 ml of water, stir well, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. Dip a magnesia stick or a nichrome or platinum wire sealed to a glass rod first into hydrochloric acid (~420 g/l) TS, then into the test solution and introduce it into a nonluminous flame; a bright yellow colour is observed.

2. To 1.0 ml of the test solution add about 0.5 ml of cobalt(II) chloride (30 g/l) TS; a violet precipitate is produced which is soluble in carbon tetrachloride R.

3. To 1.0 ml of the test solution add a few drops of potassium iodobismuthate/acetic acid TS; a violet precipitate is produced.

SPIRONOLACTONE TABLETS

Description. Each tablet usually contains 25 mg of spironolactone.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of spironolactone.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, extract it twice with 10-ml portions of chloroform R, filter and evaporate the combined filtrate to dryness on a water-bath. Dissolve the residue in 3 ml of methanol R, filter, evaporate the filtrate to dryness and use the residue as the test substance.

Identity tests

Melting point. The test substance melts at about 205 °C.

Colour and other reactions

1. Dilute 1 ml of sulfuric acid (~1760 g/l) TS with 1.0 ml of water, add 20 mg of the test substance and shake; an orange solution with an intense yellowish green fluorescence is produced. Gently heat the solution; the colour becomes deep red and the evolved hydrogen sulfide blackens lead acetate paper R held over the tube. Pour the solution into water; a greenish yellow opalescent solution is produced.

2. Dissolve about 1–2 mg of the test substance in 2.0 ml of blue tetrazolium/sodium hydroxide TS; a purple colour is produced.

STREPTOMYCIN SULFATE INJECTION

Description. The injection is a sterile solution of streptomycin sulfate usually

containing the equivalent of 500 mg of streptomycin in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the ampoules equivalent to 1.0 g of streptomycin and use directly as the test solution.

Identity tests

Colour and other reactions

1. To about 0.2 ml of the test solution add 1.0 ml of sodium hydroxide (~80 g/l) TS and heat on a water-bath for 5 minutes. Cool and add 1.5 ml of hydrochloric acid (~70 g/l) TS and 3 drops of ferric chloride (25 g/l) TS; an intense violet colour is produced.

2. To about 0.1 ml of the test solution add 1.0 ml of pyridine R, 1.0 ml of sodium hydroxide (~80 g/l) TS and 3 drops of benzenesulfonyl chloride R and shake well; a violet colour is produced.

3. Add 1 drop of the test solution to 2.0 ml of 4-dimethylaminobenzaldehyde TS and heat on a water-bath for 2 minutes; a violet-red colour is produced.

4. To 2 drops of the test solution add 2.0 ml of water and 3 drops of barium chloride (50 g/l) TS and shake; a white, crystalline precipitate is produced.

STREPTOMYCIN SULFATE POWDER FOR INJECTION

Description. Each vial contains a sterile powder of streptomycin sulfate usually equivalent to 1.0 g of streptomycin.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amounts equivalent to 30 mg and 150 mg of streptomycin.

2. Empty the vials, weigh out the above-calculated equivalent amounts and use directly: 30 mg for test substance 1 divided into 3 equal parts; 150 mg for test substance 2, divided into 3 equal parts.

Identity tests

Colour and other reactions

1. Dissolve 2 parts of test substance 2 in 1.0 ml of sodium hydroxide (~80 g/l) TS and heat on a water-bath for 5 minutes. Cool and add 1.5 ml of hydrochloric acid (~70 g/l) TS and 1 drop of ferric chloride (25 g/l) TS; an intense violet colour is produced.

2. Dissolve 1 part of test substance 2 in 1.0 ml of pyridine R, add 1.0 ml of sodium hydroxide (~80 g/l) TS and 3 drops of benzenesulfonyl chloride R and shake well; a violet colour is produced.

3. Dissolve 1 part of test substance 1 in 2.0 ml of 4-dimethylaminobenzaldehyde TS and heat on a water-bath for 2 minutes; a purplish red colour is produced.

4. Dissolve 2 parts of test substance 1 in 2.0 ml of water and add 3 drops of barium chloride (50 g/l) TS; a white, crystalline precipitate is produced.

SULFACETAMIDE SODIUM OPHTHALMIC SOLUTION

Description. The solution usually contains 100 mg of sulfacetamide sodium in 1.0 ml of a suitable vehicle.

Preparation of the sample. Pool the contents of the containers equivalent to 0.15 g of sulfacetamide sodium and use directly as the test solution.

Identity tests

Colour and other reactions

1. To the test solution add 2.0 ml of acetic acid (~60 g/l) TS; a white precipitate is produced. Collect the precipitate on a filter-paper, wash with a minimum amount of water and dry; melting point, about 183 °C. (Retain the crystals for tests 2, 3 and 4, dividing them into 3 equal parts.)

2. Dissolve 1 part of the crystals obtained in test 1 in 2.0 ml of warm hydrochloric acid (~70 g/l) TS and cool in ice. Add 2–3 drops of sodium nitrite (10 g/l) TS, allow to stand for a few minutes and add 1.0 g of urea R and a solution of 10 mg of 2-naphthol R dissolved in 2.0 ml of sodium hydroxide (~80 g/l) TS; an orange-red precipitate is produced.

3. To 1 part of the crystals obtained in test 1 add 5 drops of ethanol (~750 g/l) TS and 5 drops of sulfuric acid (~1760 g/l) TS and heat gently; a faint odour of ethyl acetate is perceptible.

4. Acidify 1 part of the crystals obtained in test 1 with acetic acid (~300 g/l) TS and add 2.0 ml of magnesium uranyl acetate TS or zinc uranyl acetate TS; a light yellow, crystalline precipitate is formed.

SULFADIAZINE TABLETS

Description. Each tablet usually contains 300–500 mg of sulfadiazine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amounts equivalent to 0.14 g and 15 mg of sulfadiazine.

2. Grind the tablets, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.14 g for test substance 1, dividing it into 2 equal parts; 15 mg for test substance 2.

Identity tests

Colour and other reactions

1. To 1 part of test substance 1 add 2.0 ml of sodium nitrite (10 g/l) TS and 1.0 ml of hydrochloric acid (~70 g/l) TS, shake and allow to stand for 1 minute. Using pH-indicator paper R add sufficient sodium hydroxide (~80 g/l) TS for the solution to become alkaline and 5 mg of 2-naphthol R; a deep red colour is produced.

2. To test substance 2 add 5 ml of water, 1.0 ml of sodium hydroxide (~80 g/l) TS and 2 drops of copper(II) sulfate (160 g/l) TS. Heat to boiling; an olive green precipitate is formed. Allow to stand; the colour of the precipitate turns to grey.

3. To 1 part of test substance 1 add 1.0 ml of water and 1.0 ml of 4-dimethylaminobenzaldehyde TS; a yellow-orange colour is produced.

SULFADIMIDINE TABLETS

Description. Each tablet usually contains 500 mg of sulfadimidine.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.20 g of sulfadimidine.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material and use directly as the test substance, dividing it into 8 equal parts.

Identity tests

Heating behaviour. Heat a small quantity of the test substance; it melts, becomes yellow and a characteristic odour is produced with the evolution of white fumes. Apply intense heat; the substance turns brown, then black and when inflamed, it burns with a luminous flame.

Colour and other reactions

1. To 2 parts of the test substance add 1.0 ml of hydrochloric acid (~250 g/l) TS and 1.5 ml of water. Shake, filter and to the filtrate add 1 ml of formaldehyde TS; no precipitate is produced. Boil the mixture; it becomes yellow and after cooling a precipitate separates. Add 4 ml of sodium hydroxide (~80 g/l) TS; the precipitate remains undissolved.

2. To 1 part of the test substance add 1.0 ml of a mixture composed of 0.5 ml of sodium hydroxide (~80 g/l) TS and 9.5 ml of water. Shake and add 2 drops of copper(II) sulfate (160 g/l) TS; a precipitate is produced, the colour of which changes quickly from yellow to light green. Shake the mixture; the colour of the precipitate turns quickly to light brown.

3. To 3 parts of the test substance add 1.0 ml of water and 1.0 ml of 4-dimethylaminobenzaldehyde TS; a yellow-orange colour is produced.

TETRACYCLINE HYDROCHLORIDE CAPSULES

Description. Each capsule usually contains 250 mg of tetracycline hydrochloride.

Preparation of the sample

1. Weigh the contents of 1 capsule and calculate the amount equivalent to 0.10 g of tetracycline hydrochloride.

2. Empty the capsules, weigh out the above-calculated equivalent amount, shake it with 10 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To about 2 ml of sulfuric acid (~1760 g/l) TS add 2 drops of the test solution; a red-violet colour is produced which remains unchanged for more than 2 minutes. Allow to stand for 5 minutes, then cautiously add 2.0 ml of water; a yellow colour is produced.

2. In a porcelain dish warm 2.0 ml of zinc chloride (500 g/l) TS until a skin is formed on the surface of the solution. Add 2 drops of the test solution and continue to warm for 1 minute; a yellow-orange colour is produced.

3. To 1.0 ml of the test solution add a few drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced which dissolves in 5–6 ml of ammonia (~100 g/l) TS.

TETRACYCLINE HYDROCHLORIDE OPHTHALMIC OINTMENT

Description. The ointment usually contains 10 mg of tetracycline hydrochloride per gram of a suitable ointment base.

Preparation of the sample. Withdraw and weigh an amount equivalent to 30 mg of tetracycline hydrochloride and dissolve it in 25 ml of light petroleum R by warming carefully on a water-bath. Collect the residue by decanting, wash it with 3 portions of 25 ml of light petroleum R and use as the test substance.

Identity tests

Colour and other reactions

1. To about 1 mg of the test substance add 2 ml of sulfuric acid (~1760 g/l) TS; a red-violet colour is produced which, on the addition of 5–6 ml of water, changes to yellow.

2. In a porcelain dish warm 2.0 ml of zinc chloride (500 g/l) TS until a skin is formed on the surface of the solution or to a partial evaporation, add about 1 mg of the test substance and continue to warm for 1 minute; a yellow-orange colour is produced.

3. Dissolve 10 mg of the test substance in 1.0 ml of water and add a few drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced which dissolves in 5–6 ml of ammonia (~100 g/l) TS.

TETRACYCLINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 250 mg of tetracycline hydrochloride. The tablets may be coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amount equivalent to 0.10 g of tetracycline hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To about 2 ml of sulfuric acid (~1760 g/l) TS add 2 drops of the test solution; a red-violet colour is produced which remains unchanged for more than 2 minutes. Allow to stand for 5 minutes, then cautiously add 2.0 ml of water; a yellow colour is produced.

2. In a porcelain dish warm 2.0 ml of zinc chloride (500 g/l) TS until a skin is formed on the surface of the solution. Add 2 drops of the test solution and continue to warm for 1 minute; a yellow-orange colour is produced.

3. To 1.0 ml of the test solution add a few drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced which dissolves in 5–6 ml of ammonia (~100 g/l) TS.

THIAMINE HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 50 mg of thiamine hydrochloride.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.05 g of thiamine hydrochloride.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 5 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 1.0 ml of the test solution add 1.0 ml of sodium hydroxide (~80 g/l) TS, 4 drops of potassium ferricyanide (50 g/l) TS and 5 ml of 2-butanol R and shake. Allow the layers to separate; the 2-butanol layer shows a blue fluorescence in bright daylight or in ultraviolet light (365 nm) which disappears after the addition of acid and reappears when the solution is made alkaline.

2. To 1.0 ml of the test solution add 1–2 drops of nitric acid (~130 g/l) TS and a few drops of silver nitrate (40 g/l) TS; a white, curdy precipitate is produced. Add a few drops of ammonia (~100 g/l) TS and heat; the precipitate dissolves and the solution turns yellow, then brown and, on standing, a brown turbidity is produced.

THIOPENTAL SODIUM POWDER FOR INJECTION

Description. Each vial contains a sterile powder usually equivalent to 0.5–1.0 g of thiopental sodium.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amounts equivalent to 0.05 g and 0.5 g of thiopental sodium.

2. Empty the vials, weigh out the above-calculated equivalent amounts and use directly: 0.05 g for test substance 1; 0.5 g for test substance 2, divided into 2 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of test substance 2 add 5 ml of water, acidify with hydrochloric acid (~70 g/l) TS, filter, wash the precipitate with water, recrystallize from ethanol (~150 g/l) TS and dry at 105 °C; melting point, about 160 °C.

2. Moisten a small amount of test substance 1 with a few drops of hydrochloric acid (~70 g/l) TS and introduce into a nonluminous flame using a magnesia stick or a nichrome or platinum wire sealed to a glass rod; the flame acquires a bright yellow colour.

3. To the test substance 1 remaining after test 2 add 2.0 ml of hot cobalt(II) acetate/methanol TS, heat the mixture, add about 40 mg of powdered sodium tetraborate R and heat again to boiling; a blue-violet colour is produced.

4. Fuse 1 part of test substance 2 with 1 g of sodium hydroxide R in a test-tube until the glass glows red; the melt turns red-brown and vapours are evolved. Insert a piece of moistened pH-indicator paper R into the vapours; its coloration is changed to an alkaline range. Cool the melt, add 2.0 ml of water, mix well and filter. Acidify the filtrate with sulfuric acid (~100 g/l) TS and heat gently; the vapours evolved turn a strip of lead nitrate paper R to brown and then to black.

TOLBUTAMIDE TABLETS

Description. Each tablet usually contains 500 mg of tolbutamide.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 1.0 g of tolbutamide.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 5 quantities, each of 4 ml, of chloroform R. Filter, and evaporate the filtrate carefully to dryness on a water-bath and use the residue as the test substance.

Identity tests

Colour and other reactions

1. To 8 ml of water cautiously add 4 ml of sulfuric acid (~1760 g/l) TS and 0.20 g of the test substance and heat under reflux for 30 minutes (a 25-ml conical flask with a small filter funnel may be used). Cool the solution in an ice-bath and collect the precipitate on a filter. Keep the filtrate for test 2. Recrystallize the precipitate from hot water and dry at 105 °C for 3 hours; melting temperature, about 136 °C.

2. To the filtrate from test 1 add sufficient sodium hydroxide (~200 g/l) TS to make it alkaline and heat; an odour of butylamine is perceptible.

TRIMETHOPRIM TABLETS

Description. Each tablet usually contains 100–200 mg of trimethoprim.

Preparation of the sample

1. Weigh 1 tablet and calculate the amount equivalent to 0.05 g of trimethoprim.

2. Grind the tablets, weigh out the above-calculated equivalent amount as powdered material, shake it with 10 ml of chloroform R, filter, evaporate the filtrate to dryness and use the residue as the test substance, dividing it into 4 equal parts.

Identity tests

Colour and other reactions

1. To 1 part of the test substance add 5 ml of sulfuric acid (~1760 g/l) TS and 1 drop of nitric acid (~1000 g/l) TS; a red colour is produced.

2. To 1 part of the test substance add 5 ml of sulfuric acid (~1760 g/l) TS and 1 drop of ferric chloride (25 g/l) TS and warm the solution in a water-bath for 3 minutes. Cool and add to the yellow solution 1 drop of nitric acid (~130 g/l) TS; the colour of the solution turns to red.

3. To 2 parts of the test substance add 5 ml of a mixture of 1 ml of sulfuric acid (~5 g/l) TS and 10 ml of water and heat. Then add 2 ml of a mixture of 1.6 g of potassium permanganate R dissolved in sufficient sodium hydroxide (0.1 mol/l) VS to produce 100 ml. Heat to boiling and add to the hot solution 0.4 ml of formaldehyde TS. Mix, add 0.5 ml of sulfuric acid (~100 g/l) TS, mix and again heat to boiling; the colour of the mixture changes from brown to yellow and the precipitate dissolves. To the solution add 3 ml of chloroform R and shake the flask vigorously; a green fluorescence is observed in the chloroform layer when examined under ultraviolet light (365 nm).

VERAPAMIL HYDROCHLORIDE TABLETS

Description. Each tablet usually contains 40–80 mg of verapamil hydrochloride. The tablets may be sugar-coated.

Preparation of the sample

1. If the tablets are coated, carefully remove the coating by scraping. Weigh 1 tablet or core and calculate the amounts equivalent to 0.10 g and 20 mg of verapamil hydrochloride.

2. Grind the tablets or cores, weigh out the above-calculated equivalent amounts as powdered material and use directly: 0.10 g for test substance 1; 20 mg for test substance 2.

3. Shake test substance 1 with 10 ml of water, filter and use the filtrate as the test solution.

Identity tests

Colour and other reactions

1. To 2.0 ml of the test solution add 0.20 ml of mercuric chloride (65 g/l) TS; a white precipitate is produced.

2. To 2.0 ml of the test solution add about 0.5 ml of sulfuric acid (~100 g/l) TS and 4 drops of potassium permanganate (10 g/l) TS; a violet precipitate is produced which dissolves gradually to form a pale yellow solution.

3. Shake 0.20 g of citric acid R with 10 ml of acetic anhydride R. To 1.0 ml of the supernatant solution add test substance 2 and heat on a water-bath; a purple colour is produced.

VINCRISTINE SULFATE POWDER FOR INJECTION

Description. Each vial contains a sterile powder usually equivalent to 1–5 mg of vincristine sulfate.

Preparation of the sample

1. Weigh the contents of 1 vial and calculate the amount equivalent to 2.0 mg of vincristine sulfate.

2. Empty the vials, weigh out the above-calculated equivalent amount, shake it with 3 ml of a mixture of 9 volumes of chloroform R and 1 volume of methanol R and filter. Evaporate the filtrate to dryness at 40 °C in a water-bath and use the residue as the test substance, dividing it into 2 equal parts.

Identity tests

Colour and other reactions

1. Dissolve 10 mg of ceric ammonium sulfate R in about 1 ml of phosphoric acid (~1440 g/l) TS and to 2 drops of this solution add 1 part of the test substance; a blue-violet colour is observed which changes slowly to brown.

2. To 1 part of the test substance add about 0.2 ml of vanillin/hydrochloric acid TS and allow to stand for 1 minute; an orange colour is observed.

6. Equipment

Basic tests require little laboratory equipment. Test-tubes are used for the majority of the tests. In some cases porcelain crucibles are also needed. Flasks and beakers are necessary for the preparation of reagents.

Glassware and porcelain dishes (the dimensions are indicative only)

Test-tubes	170 x 15 mm, 100 x 10 mm
Test-tubes with glass stoppers	170 x 15 mm
Beakers	50, 100, 250, 400 and 1000 ml
Porcelain or quartz crucibles	
Fused silica crucibles	
Flasks, flat or round-bottomed	50, 100 and 500 ml
Conical flasks with stoppers	50 ml
Wash bottles, glass or plastic	
Porcelain dishes	diameter 60 and 80 mm
Watch-glasses	diameter 50 and 75 mm
Mortar with pestle	
Filter funnels	diameter 25, 50 and 100 mm
Separating funnels	60 and 125 ml
Sintered glass funnels	
Bottles with screw-caps, wide-mouthed	
Glass rods	

Volumetric measuring vessels

Measuring cylinders	25, 50, 100 and 250 ml
Graduated pipettes	1, 2, 5 and 10 ml
Dropping pipettes	
Volumetric flasks	100, 250 and 1000 ml
Burette	25 ml

Other equipment

Spatulas
Test-tube holder
Test-tube brushes
Test-tube clamps
Test-tube rack
Set of cork borers with sharpener
Rubber or polyethylene stoppers (different sizes)

Crucible tongs
Suction bottle
Water-pump or similar source of vacuum
Water-bath
Drying oven
Suitable electric or gas heater or alcohol burner
Wire-gauze quares with asbestos
Clay-covered triangles
Tripod
Supports with screw clamps and rings
Distillation apparatus (Liebig-type condensers)
Desiccator
Melting-point apparatus with capillaries
Nichrome or platinum wire sealed to a glass rod, or magnesia sticks. (Prior to use, the utensils should produce a colourless flame, indicating the absence of the ion to be determined.)
Filter-paper
pH-Indicator paper
Polyethylene dropping bottles
Suitable glass or polyethylene reagent bottles (different sizes)
Ultraviolet-light source (short and long wave).
Balances (technical, 1–200 g; hand scale, up to 10 g)

7. Reagents

The reagents, test solutions and volumetric solutions mentioned in the basic tests are described below. Reagents are denoted by the abbreviation R, test solutions by the abbreviation TS, and volumetric solutions by the abbreviation VS. The concentration of the reagent solutions is expressed in g/l, that is, grams of anhydrous substance per litre of water or solvent, as indicated. Where no solvent is indicated, demineralized water should be used. The procedures for the preparation of test solutions that require special attention are given in detail.

Acetic acid, glacial, R.

Acetic acid (~300 g/l) TS.

Acetic acid (~60 g/l) TS.

Acetic anhydride R.

Acetone R.

Ammonia (~260 g/l) TS.

Ammonia (~100 g/l) TS.

Ammonium chloride R.

Ammonium molybdate R.

Ammonium molybdate (95 g/l) TS.

Ammonium molybdate/sulfuric acid TS.
Procedure. Dissolve 0.5 g of ammonium molybdate R in sufficient sulfuric acid (~1760 g/l) TS to produce 10 ml.

Ammonium thiocyanate R.

Ammonium thiocyanate (75 g/l) TS. A solution of ammonium thiocyanate R containing about 75 g of NH_4SCN per litre.
Note. Ammonium thiocyanate (75 g/l) TS must be freshly prepared.

Barium chloride R.

Barium chloride (50 g/l) TS. A solution of barium chloride R containing about 52 g of $BaCl_2$ per litre (approximately 0.25 mol/l).
Procedure. Dissolve about 61 g of barium chloride R ($BaCl_2,2H_2O$) in sufficient water to produce 1000 ml.

Benzenesulfonyl chloride R.

Bismuth oxynitrate R.

Blue tetrazolium R.

Blue tetrazolium/sodium hydroxide TS.
Procedure. Immediately before use, mix 1 volume of a 2 mg/ml solution of blue tetrazolium R in water with 3 volumes of a 0.12 g/ml solution of sodium hydroxide R in methanol R.

Bromine R.

Bromine TS. A saturated solution of bromine R.

2-Butanol R.

Calcium chloride, hydrated, R.

Calcium chloride (55 g/l) TS.

Calcium hydroxide R.

Calcium hydroxide TS.
Procedure. Prepare a saturated solution of calcium hydroxide R.
Note. Calcium hydroxide TS must be freshly prepared.

Calcium oxide R.

Carbon tetrachloride R.

Ceric ammonium sulfate R.

Ceric ammonium sulfate/nitric acid TS.
Procedure. Dissolve 5 g of ceric ammonium sulfate R in sufficient nitric acid (~130 g/l) TS to produce 100 ml.

Chloroform R.

Chromic acid TS.
Procedure. Dissolve 84 g of chromium trioxide R in 700 ml of water and add slowly, while stirring, 400 ml of sulfuric acid (~1760 g/l) TS.

Chromium trioxide R.

Citric acid R.

Citric acid (90 g/l) TS. A solution of citric acid R containing about 90 g of $C_6H_8O_7$ per litre.
Procedure. Dissolve about 100 g of citric acid ($C_6H_8O_7$,H_2O) in sufficient water to produce 1000 ml.

Cobalt(II) acetate R.

Cobalt(II) acetate/methanol TS.
Procedure. Dissolve 20 mg of cobalt(II) acetate R in 10 ml of methanol R.

Cobalt(II) chloride R.

Cobalt(II) chloride (30 g/l) TS. A solution of cobalt(II) chloride R containing about 30 g of $CoCl_2$ per litre.
Procedure. Dissolve about 55 g of cobalt(II) chloride R ($CoCl_2$,$6H_2O$) in sufficient water to produce 1000 ml.

Copper(II) acetate R.

Copper(II) acetate (45 g/l) TS. A solution of copper(II) acetate R containing about 45 g of $C_4H_6CuO_4$ per litre.
Procedure. Dissolve about 50 g of copper(II) acetate R ($C_4H_6CuO_4$,H_2O) in sufficient water to produce 1000 ml.

Copper(II) sulfate R.

Copper(II) sulfate (160 g/l) TS. A solution of copper(II) sulfate R containing about 160 g of $CuSO_4$ per litre.
Procedure. Dissolve about 250 g of copper(II) sulfate R ($CuSO_4$,$5H_2O$) in sufficient water to produce 1000 ml.

Cyclohexane R.

Diazobenzenesulfonic acid TS.
Procedure. To 0.9 g of sulfanilic acid R add 25 ml of hydrochloric acid (~250 g/l) TS and sufficient water to produce 100 ml. To 3 ml of this solution add 1.5 ml of sodium nitrite (10 g/l) TS, cool in ice for 5 minutes, add a further 6 ml of sodium nitrite (10 g/l) TS, and again cool in ice; dilute with water to 100 ml, keeping the solution cold.
Note. Diazobenzenesulfonic acid TS must be freshly prepared and should not be used until at least 15 minutes after its preparation.

Dichloromethane R.

4-Dimethylaminobenzaldehyde R.

4-Dimethylaminobenzaldehyde TS.

Procedure. Dissolve 0.125 g of 4-dimethylaminobenzaldehyde R in a cooled mixture of 65 ml of sulfuric acid (~1760 g/l) TS and 35 ml of water, and add 0.2 ml of ferric chloride (25 g/l) TS.
Note. 4-Dimethylaminobenzaldehyde TS must be freshly prepared.

Dimethylformamide R.

Diphenylamine R.

Diphenylamine/sulfuric acid TS.
Procedure. Dissolve 1.0 g of diphenylamine R in 100 ml of sulfuric acid (~1760 g/l) TS.
Storage. Diphenylamine/sulfuric acid TS must be colourless, and should be kept protected from light.

Disodium hydrogen phosphate, anhydrous, R.

Disodium hydrogen phosphate (100 g/l) TS.

Ethanol, dehydrated, R.

Ethanol (~750 g/l) TS.

Ethyl acetate R.

Ferric chloride R.

Ferric chloride (25 g/l) TS. A solution of ferric chloride R containing about 27 g of $FeCl_3$ per litre.
Procedure. Dissolve about 45 g of ferric chloride R ($FeCl_3,6H_2O$) in sufficient water to produce 1000 ml.

Ferrous sulfate R.

Ferrous sulfate (15 g/l) TS. A solution of ferrous sulfate R containing about 15 g of $FeSO_4$ per litre (approximately 0.1 mol/l).
Procedure. Dissolve about 28 g of ferrous sulfate R ($FeSO_4,7H_2O$) in sufficient freshly boiled and cooled water to produce 1000 ml.
Note. Ferrous sulfate (15 g/l) TS must be freshly prepared.

Formaldehyde TS.

Formaldehyde/sulfuric acid TS.
Procedure. To 10 ml of sulfuric acid (~1760 g/l) TS add 0.2 ml of formaldehyde TS.
Shelf-life. Use within 1 month of preparation.

Gold chloride R.

Gold chloride TS.
Procedure. Dissolve 1.0 g of gold chloride R in 35 ml of water.

Hydrochloric acid (~420 g/l) TS.

Hydrochloric acid (~250 g/l) TS.

Hydrochloric acid (~70 g/l) TS.

Hydrogen peroxide (330 g/l) TS.

Hydroxylamine hydrochloride R.

Hydroxylamine hydrochloride (10 g/l) TS.

pH-Indicator paper R. A paper impregnated with a suitable mixture of indicators that permits, through changeable coloration, estimation of the pH of a solution in at least the range pH 1-10 with adequate sensitivity (usually 1 pH unit).

Iodine R.

Iodine TS.
Procedure. Dissolve 2.6 g of iodine R and 3 g of potassium iodide R in sufficient water to produce 100 ml (approximately 0.1 mol/l).

Lead acetate R.

Lead acetate (80 g/l) TS. A solution of lead acetate R in freshly boiled water containing about 80 g of $C_4H_6O_4Pb$ per litre (approximately 0.25 mol/l).

Lead acetate paper R.
Procedure. Dip strips of filter-paper into a mixture of 10 volumes of lead acetate (80 g/l) TS and 1 volume of acetic acid (60 g/l) TS. Allow to dry and cut the paper into strips measuring 15 mm x 40 mm.
Storage. Lead acetate paper R should be kept in a well-closed container.

Lead nitrate R.

Lead nitrate paper R.
Procedure. Dip some strips of filter-paper into a solution of 10 g of lead nitrate R in 100 ml of water, and let them dry.

Litmus paper R.

Magnesium acetate R.

Magnesium sulfate R.

Magnesium sulfate (50 g/l) TS. A solution of magnesium sulfate R containing about 50 g of $MgSO_4$ per litre.
Procedure. Dissolve about 100 g of magnesium sulfate R ($MgSO_4,7H_2O$) in sufficient water to produce 1000 ml.

Magnesium uranyl acetate TS.
Procedure. Warm on a water-bath 3.2 g of uranyl acetate R ($C_4H_6O_6U,2H_2O$), 10 g of magnesium acetate R ($C_4H_6MgO_4,4H_2O$) dissolved in 2 ml of glacial acetic acid R, and about 30 ml of water. After complete dissolution, cool to room temperature and add 50 ml of ethanol (~750 g/l) TS and sufficient water to produce 100 ml. Allow the solution to stand for 24 hours and filter.
Note. Magnesium uranyl acetate TS must be freshly prepared.

Maleic acid R.

Mercuric chloride R.

Mercuric chloride (65 g/l) TS.

Mercuric oxide, yellow, R.

Mercuric sulfate TS.
Procedure. Mix 5 g of yellow mercuric oxide R with 40 ml of water and, while stirring, add 20 ml of sulfuric acid (~1760 g/l) TS, then add 40 ml of water and stir until completely dissolved.

Methanol R.

Methylthioninium chloride R.
Synonym. Methylene blue.

Methylthioninium chloride (1 g/l) TS.

2-Naphthol R.

2-Naphthol TS.
Procedure. Dissolve 5 g of 2-naphthol R, freshly recrystallized, in 40 ml of sodium hydroxide (~80 g/l) TS and add sufficient water to produce 100 ml.
Storage. Keep the solution in a cool place.
Note. 2-Naphthol TS must be freshly prepared.

Nitric acid, fuming, R.

Nitric acid (~1000 g/l) TS.

Nitric acid (~130 g/l) TS.

Parafomaldehyde R.

Petroleum, light, R.

Phenol, liquefied, R.

Phenolphthalein R.

Phenolphthalein/ethanol TS.
Procedure. Dissolve 1.0 g of phenolphthalein R in sufficient ethanol (~750 g/l) TS to produce 100 ml.

Phosphoric acid (~1440 g/l) TS.

Phosphorus pentoxide R.

Potassio-cupric tartrate TS.
Procedure. Dissolve 7 g of copper(II) sulfate R in sufficient water to produce 100 ml (solution 1). Dissolve 35 g of potassium sodium tartrate R and 10 g of sodium hydroxide R in 100 ml of water (solution 2). Shortly before use, mix equal volumes of solutions 1 and 2.

Potassio-mercuric iodide TS.
Procedure. Dissolve 1.355 g of mercuric chloride R in 60 ml of water; dissolve 5 g of potassium iodide R in 20 ml of water; mix the two solutions and add sufficient water to produce 100 ml.

Potassio-mercuric iodide, alkaline, TS.
Procedure. Dissolve 3.5 g of potassium iodide R and 1.25 g of mercuric chloride R in 80 ml of water and add a cold saturated solution of mercuric chloride R in water, with constant stirring, until a slight red precipitate remains. Add 12 g of sodium hydroxide R and dissolve. Add a little more of the saturated solution of mercuric chloride R and sufficient water to produce 100 ml. Allow to stand for 24 hours and decant the clear liquid.

Potassium bicarbonate R.

Potassium bromate R.

Potassium bromate (15 g/l) TS.

Potassium bromide R.

Potassium carbonate R.

Potassium dichromate R.

Potassium dichromate (100 g/l) TS.

Potassium ferricyanide R.

Potassium ferricyanide (50 g/l) TS.

Potassium ferrocyanide R.

Potassium ferrocyanide (45 g/l) TS. A solution of potassium ferrocyanide R containing about 45 g of $K_4Fe(CN)_6$ per litre.
Procedure. Dissolve about 50 g of potassium ferrocyanide R ($K_4Fe(CN)_6,3H_2O$) in sufficient water to produce 1000 ml.

Potassium hydroxide R.

Potassium hydroxide/ethanol TS.
Procedure. Dissolve 40 g of potassium hydroxide R in 20 ml of water and add sufficient ethanol (~750 g/l) TS to produce 1000 ml. Allow to stand overnight, and pour off the clear liquid.

Potassium iodide R.

Potassium iodobismuthate/acetic acid TS.
Procedure. Dissolve 8 g of potassium iodide R in 20 ml of water, and add to it a solution composed of 0.85 g of bismuth oxynitrate R dissolved in 40 ml of water and 10 ml of glacial acetic acid R.

Potassium nitrate R.

Potassium permanganate R.

Potassium permanganate (10 g/l) TS.

Potassium sodium tartrate R.

Pyridine R.

Resorcinol R.

Silica gel, desiccant, R.

Silver nitrate R.

Silver nitrate (40 g/l) TS.

Sodium acetate R.

Sodium carbonate R.

Sodium carbonate, anhydrous, R.

Sodium carbonate (50 g/l) TS. A solution of sodium carbonate R containing about 50 g of Na_2CO_3 per litre.
Procedure. Dissolve about 135 g of sodium carbonate R (Na_2CO_3,$10H_2O$) in sufficient water to produce 1000 ml.

Sodium chloride R.

Sodium cobaltinitrite R.

Sodium cobaltinitrite (100 g/l) TS.

Sodium hydrogen carbonate R.

Sodium hydrogen carbonate (40 g/l) TS.

Sodium hydroxide R.

Sodium hydroxide (~400 g/l) TS.

Sodium hydroxide (~200 g/l) TS.

Sodium hydroxide (~150 g/l) TS.

Sodium hydroxide (~80 g/l) TS.

Sodium hydroxide (0.1 mol/l) VS.

Sodium metaperiodate R.

Sodium metaperiodate (60 g/l) TS.

Sodium nitrate R.

Sodium nitrite R.

Sodium nitrite (10 g/l) TS.

Sodium sulfate, anhydrous, R.

Sodium sulfite R.

Sodium tetraborate R.

Starch R. Corn or potato starch R.

Starch, soluble, R.

Starch TS.
Procedure. Mix 0.5 g of starch R or soluble starch R with 5 ml of water and add this solution with constant stirring, to sufficient water to produce about 100 ml. Boil for a few minutes, cool and filter.
Note. Starch TS must be freshly prepared.

Sulfamic acid R.

Sulfamic acid (100 g/l) TS.

Sulfanilic acid R.

Sulfanilic acid TS.
Procedure. Dissolve about 0.5 g of sulfanilic acid R in 150 ml of acetic acid (~300 g/l) TS.

Sulfuric acid (~1760 g/l) TS.

Sulfuric acid (~100 g/l) TS.

Sulfuric acid (~5 g/l) TS.

Tannic acid R.

Tannic acid (100 g/l) TS.

Tartaric acid R.

Tartaric acid (10 g/l) TS.

Thionine R.

Thionine (1 g/l) TS.

Thionyl chloride R.

Tolbutamide R. Quality of substance conforms to the monograph of *The International Pharmacopoeia.*

Triketohydrindene hydrate R.

Triketohydrindene/ethanol TS.
Procedure. Prepare a saturated solution of triketohydrindene hydrate R in ethanol (~750 g/l) TS.

Trinitrophenol R.

Trinitrophenol (7 g/l) TS.

Trinitrophenol, alkaline, TS.
Procedure. Mix 20 ml of a 10 mg/ml solution of trinitrophenol R with 10 ml of a 50 mg/ml solution of sodium hydroxide R, dilute with water to 100 ml and mix.
Note. Do not use alkaline trinitrophenol TS longer than 48 hours after preparation.

Trinitrophenol/ethanol TS.
Procedure. Dissolve 33 g of trinitrophenol R in sufficient ethanol (~750 g/l) TS to produce 1000 ml.

Uranyl acetate R.

Urea R.

Vanillin R.

Vanillin/hydrochloric acid TS.
Procedure. Dissolve 0.10 g of vanillin R in sufficient hydrochloric acid (~250 g/l) TS to produce 100 ml.
Note. Vanillin/hydrochloric acid TS must be freshly prepared.

Water, carbon-dioxide-free, R.

Zinc R powder.

Zinc acetate R.

Zinc chloride R.

Zinc chloride (500 g/l) TS.

Zinc uranyl acetate TS.
Procedure. Dissolve 5 g of uranyl acetate R in a mixture of 1.5 ml of glacial acetic acid R and water and dilute to 50 ml with water. Then dissolve 15 g of zinc acetate R in a mixture of 1.5 ml of glacial acetic acid R and water, and dilute to 50 ml with water. Mix the two solutions, allow to stand overnight and filter through a dry filter, if necessary.

8. Index of dosage forms

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This manual, which is complementary to WHO's 1986 publication, *Basic tests for pharmaceutical substances*, describes simple and readily applicable tests for verifying the identity of 150 pharmaceutical dosage forms in common use. The methods described use a limited number of easily available reagents and equipment, and do not require a fully equipped laboratory. They need not be carried out by a qualified pharmacist, but should be performed by persons with some understanding of analytical chemistry.

Basic tests are not, in any circumstances, intended to replace the requirements of pharmacopoeial monographs, which give an assurance of quality, as opposed to merely confirming identity.

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