

Index

A

- Absorption intensity, [103](#)
Absorption media, [304](#)
Accessible internal volume determination in cotton, [265](#)
Advancing and receding contact angle, [484](#)
Air permeability of textile fabrics, [491](#)
Airborne biohazards, [470](#)
Airborne microorganisms, [491](#)
Amorphous regions, [65](#)
Amorphous scattering, [78](#)
Analysis of expert hand judgment, [331](#)
Analysis of fabric hand and quality, [347](#)
Analytical pyrolysis, [3](#)
Anisotropic phase, [70](#)
Anisotropy in mechanical properties of fibers, [311](#)
Antimicrobial agents, [480](#)
Antimicrobial compounds, [475](#)
Antimicrobial properties, [475](#)
Antimicrobial treatments, [480](#)
Application of chemical degradation resistance data, [406](#)
Application of hydrostatic-based test methods, [418](#)
Application of runoff-based test methods, [418](#)
Aseptic environment, [470](#)
Assessment of chemical barrier properties, [393](#)
ASTM F 903 penetration test cell, [420](#)
ASTM F 739 permeation test cell, [436](#)

Average porosity values, [296](#)

B

Ball-milled cotton, [267](#)

Barrier materials, [6](#), [516](#)

Barrier performance of textiles, [393](#), [460](#)

Barrier products, [394](#)

Barrier properties, [7](#), [394](#)

Barrier tests, [409](#)

Becke line method, [102](#)

Biohazardous aerosol, [491](#)

Biohazards, [7](#)

Biosafety cabinets, [491](#)

Birefringence, [102](#), [106](#)

Bloodborne pathogens, [516](#), [517](#)

Bragg's law, [112](#)

Breakthrough pressure, [490](#)

Breakthrough time, [430](#), [443](#)

Bubble pressure measurement, [304](#)

Burst strength of film-reinforced textiles, [513](#)

1,2,3,4-butanetetracarboxylic acid (BTCA), [238](#), [285](#)

Butyl rubber, [394](#)

C

Capacity factor for a solute, [212](#)

Capillary viscometer, [36](#)

Caustic mercerization, [279](#)

Changes in the pore size distributions in cotton fibers, [279](#), [281](#)

Characteristics of pathogenic fungi, [530](#)

Characteristics of pathogenic microbes, [519](#)

Characterization of pore structure and surface area, [215](#)

Characterization of porous network, [295](#)

Chemical barrier materials, [393](#)

Chemical barrier tests, [460](#)

Chemical composition, [10](#)

Chemical degradation resistance testing, [408](#)

Chemical modification of cotton, [269](#)

Chemical permeation, [6](#)

Chemical permeation tests, [432](#)

Chemical protective garments, [395](#)

Chemical resistance properties, [395](#), [480](#)

Chemical resistance test approaches, [396](#)

degradation resistance, [396](#), [397](#)

penetration resistance, [396](#)

permeation resistance, [396](#)

Chemical structure of polymers, [9](#)

Chlorobutyl rubber, [394](#)

Chroma, [364](#)

Chroma difference (ΔC_{ab}^*), [365](#)

Chromatogram, [210](#)

Chromatogram resolution factor (R_s), [212](#)

Chromatographic analysis of durable press agents, [239](#)
CIE color specification by tristimulus values, [357](#)
CIE colorimetry, [356](#)
CIE standard observer, [357](#)
CIELAB color space, [359](#), [360](#)
Classification schemes for biohazards, [518](#)
Closed versus open-loop permeation systems, [438](#)
Clothing closure samples, [418](#)
Clothing seam samples, [418](#)
Clothing systems for personal protection, [470](#)
CMC color difference formula, [363](#)
Coated fabrics, [394](#), [411](#), [418](#)
Color acceptability tolerance specifications, [362](#)
Color communication, [355](#), [355](#), [386](#)
Color difference formulae, [363](#)
Color fastness assessment, [384](#)
Color instrument setup, [375](#)
Color instrument verification, [375](#)
Color matching of textiles, [6](#), [377](#)
Color measuring instruments, [369](#)
Color measuring procedure, [375](#)
Color measuring sensors, [374](#)
Color measuring systems, [5](#), [366](#)
Color quality monitoring, [355](#), [362](#), [380](#)
Color sorting systems, [381](#)
Colorant identification, separation, and purification, [218](#)
Colorant strength, [6](#)
Colorant strength evaluation, [382](#), [384](#)
Colorimetry for textile applications, [355](#)
Column mobile phase, [210](#)

Column packing, [212](#)

Column packing techniques for textile studies, [213](#)

Column performance, [211](#)

Column stationary phase, [210](#)

Columns from whole cotton fibers, [274](#)

Commission Internationale de l'Eclairage (CIE), [355](#)

Components of color difference, [362](#)

Composition of a liquid chromatograph, [208](#)

Compression strength, [316](#)

Configuration of fibrous stationary phase, [212](#)

Contact angle, [483](#)

Contact angle hysteresis, [484](#)

Contact angle measurement, [486](#)

Creep relaxation, [107](#)

Cross-linking agents for cellulosic polymer, [237](#)

Cross-linking of cellulose with BTCA, [239](#)

Cross-linking of cellulose with DMDHEU, [28](#)

Cross-sectional shape of fiber, [292](#)

Crystal packing simulation, [59](#)

Crystalline regions, [65](#)

Crystalline scattering, [78](#)

Cumulative permeation, [443](#)

D

Dark-field microscopy, [59](#)

Datacolor formula, [363](#)

Decrystallized cotton, [267](#)

Degradation resistance, [6](#)

Degradation test using immersion-based techniques, [398](#)

Degradation test using one-sided exposure techniques, [399](#)

Degradation testing, [460](#)

Degradation testing using solubility-based evaluations, [401](#)

Degree of crystallinity and orientation, [72](#)

Developments in color measuring instruments, [372](#)

Diametral change, [318](#)

Differential scanning calorimetry (DSC), [130](#), [401](#)

Differential thermal analysis (DTA), [83](#)

Diffusion, [429](#)

Dimensional stability, [481](#)

1,3-dimethyl-4,5-dihydroxy-2-imidazo-lidinone (DMDHI), [238](#), [285](#)

Dimethyloldihydroxyethyleneurea (DMDHEU), [237](#)

Direct application of fabric mechanical parameters, [351](#)

Distribution of pore sizes, [296](#)

 bimodal, [296](#)

 trimodal, [295](#)

 unimodal, [296](#)

Dye affinity, [220](#)

Dye compatibility, [220](#), [226](#)

Dye exhaustion, [6](#)

Dye fiber interactions, [220](#), [229](#)

Dye identification, [207](#)

Dye purification, [207](#)

Dye separation, [207](#)

Dye solubility, [6](#)

Dye sorption isotherm, [220](#), [222](#)

Dyeing behavior, [220](#)

Dyeing enthalphy, [220](#)

Dyeing thermodynamics, [220](#)

Dynamic mechanical analysis (DMA), [130](#)

Dynamic mechanical spectroscopy, [107](#)

E

Effect of multicomponent chemical challenges, [452](#)

Elastomeric films, [394](#)

Elastomeric glove materials, [407](#)

Electrochemical force microscopy (ECFM), [127](#)

Elution time, [210](#)

Elution volume, [275](#)

End-use environments, [482](#)

Equations for the calculation of hand values, [338](#)

Equilibrium adsorption, [272](#)

Equipment mode, [370](#)

Evaluation of adsorptive-base materials, [452](#)

Evaluation of durable press (DP) finishes, [237](#)

Evaluation of the pore structure of textile materials, [291](#)

F

F-illuminants, [358](#)

Fabric hand, [5](#)

Fabric hand evaluation, [329](#)

objective method, [330](#)

subjective method, [329](#)

Fabric quality performances, [329](#)

Fabric utility performance, [329](#)

Fiber axis, [313](#)

Fiber cross-sectional plane, [313](#)

Fiber symmetry, [313](#)

Fiberglass, [395](#)

Fibers, [3](#)

Fibril diameter, [123](#)

Fibrillar morphology, [53](#)

Fibrils, [116](#)

Fick's law, [494](#)

Film reinforced textiles, [470](#), [494](#), [510](#)

Films, [394](#)

Filtration efficiency of textiles, [538](#)

Filtration mechanisms, [496](#)

Filtration media, [304](#)

Filtration testing, [537](#)

Finish evaluation, [232](#)
Flame resistance, [481](#)
Fluorescent lamps, [356](#)
Formaldehyde-free reagents, [285](#)
Fourier transform infrared microscopy (FTIR), [12](#), [107](#)
Fourier-transform spectroscopy, [3](#)
Fourier-transform ^{13}C -NMR, [254](#)
Fractional crystallinity, [78](#)
Free relaxation, [100](#)
Frontal analysis, [273](#)

G

Gas chromatography, [3](#), [240](#)
Gel permeation chromatography, [4](#), [265](#)
Gel permeation properties, [267](#)
Geotextiles, [304](#)
Gore elbow lean test, [502](#), [504](#), [505](#)
Graded permeability, [265](#)

H

Hand evaluation and standardization committee, [330](#)
Heat of fusion, [71](#)
Heteroporous, [296](#)
High-efficiency particulate air filtration, [470](#)
High-performance liquid chromatography, [242](#)
Hue, [364](#)
Hue difference (ΔH_{ab}^*), [365](#)
Hydrophilicity vs. hydrophobicity of textiles, [483](#), [484](#)
Hydrostatic-based test methods, [417](#)

I

Illuminant A, [358](#)
Illuminants D, [358](#)
Illuminating system, [373](#)
Illumination and viewing geometries, [370](#), [371](#)
Incandescent lamps, [356](#)
Index of refraction, [102](#)
Industrial color-difference evaluation, [364](#)
Infection control, [470](#), [481](#), [497](#)
Infrared dichroism, [92](#), [103](#)
Infrared spectroscopy techniques (IR), [10](#), [248](#)
Intensity of color, [356](#)
Interference filters, [373](#)
Interlamellar cross-links, [125](#), [283](#)
Internal structure of cross-linked cotton, [283](#)
Internal volume accessible to water, [279](#)
Interpretation of liquid penetration test, [423](#)
Interpretation of permeation data, [455](#)

K

Kimberly—Clark blood strikethrough test, [501](#)
Kubelka-Munk equation, [378](#)

L

Laboratory test conditions, [481](#)
Lambert—Beer's law, [219](#)
Lamellae, [116](#)
Lamellar thickness, [123](#)
Laminate materials, [395](#), [411](#)
Laplace theory of capillarity, [489](#)
Light-detecting device, [374](#)
Lightness, [364](#)

Lightness difference (ΔL^*), [365](#)

Limitations of standard liquid challenge tests, [499](#)

Liquid absorption, [291](#)

Liquid ammonia treatment, [279](#)

Liquid barrier performance of materials, [460](#)

Liquid-based challenge testing, [496](#), [497](#)

Liquid-borne biohazard, [470](#)

Liquid-borne microbial challenge testing, [538](#)

Liquid chromatography (LC), [3](#), [207](#)

Liquid chromatography (LC) applications in textile analysis, [215](#)

Liquid porosimetry, [29](#)

Liquid surface tension, [490](#)

Longitudinal compression mode, [315](#)

Longitudinal compression property, [315](#)

Longitudinal modulus of fiber, [315](#)

Luster evaluation, [384](#)

M

Mass-spectrometry (MS), [3](#), [257](#)

Matching of color, [356](#)

Material permeation resistance, [428](#)

Material responses to liquid propellants, [401](#)

Measurement of Poisson's ratios, [322](#)
Mechanism of cross-linking, [250](#)
Mechanisms of filtration, [535](#)
Melt viscosity, [34](#), [13](#)
Mercury halide lamps, [356](#)
Metamerism evaluation, [383](#)
Microbial barrier integrity, [506](#)
Microbial barrier properties of textiles, [475](#), [481](#), [497](#)
Microbial challenge testing, [515](#)
Microbial filtration testing, [535](#)
Microbial penetration resistance, [480](#)
Microfiltration, [470](#)
Micromeasurement of mechanical properties of single fibers, [311](#), [315](#)
Micromeasurement of single fibers, [5](#)
Microorganisms, [470](#)
Microporous films, [395](#), [418](#)
Microscopy, [127](#)
 anatomic force (AFM), [127](#)
 friction force (FFM), [127](#)
 lateral force (LFM), [127](#)
 scanning electron (SEM), [145](#)
 scanning probe (SPMs), [127](#)
 scanning tunneling (STM), [127](#)
 transmission electron (TEM), [145](#)
Minimum bubble pressure method, [304](#)
Models for pathogenic microbes, [519](#)
Modes of transport for microbes, [471](#)
Moisture transport properties, [475](#)
Moisture vapor permeability, [492](#)

Molecular conformation, [62](#)

Molecular probes, [274](#)

Molecular probes used in reverse gel permeation chromatography, [275](#)

Monochromator system, [373](#)

Monolithic film reinforcements, [512](#)

Morphology of bacterial ultrastructure, [521](#)

Multiwavelength detectors, [219](#)

N

Natural light, [356](#)

Nature of biohazards, [471](#)

Near-infrared spectroscopy (NIR), [248](#)

Negative-air-pressure rooms, [491](#)

Neoprene, [394](#)

Network structure, [296](#)

Nitrile rubber, [394](#)

Nomex, [395](#)

Nonporous fabrics, [411](#)

Nonporous textiles, [470](#)

Nonwoven materials, [395](#)

Nuclear magnetic resonance spectroscopy (NMR), [15](#), [250](#)

Number of plates in an LC column, [211](#)

Nylon, [395](#)

O

Objective color specification, [356](#)

Objective measurement of fabric hand, [329](#), [334](#)

bending property, [335](#)

compression property, [335](#)

shearing property, [335](#)

surface property, [336](#)

tensile property, [335](#)

Observed color, [356](#)

P

Parameters affecting permeation resistance testing, [434](#)

Peak in the chromatogram, [210](#)

Penetration mechanisms, [496](#)

Penetration of organisms, [480](#)

Penetration resistance testing, [410](#)

Penetration vs. permeation, [494](#)

Perceived risk of microbes, [471](#)

Perception of color, [356](#)

Performance of finished products, [543](#)

Performance objectives for textiles, [472](#)

Permeation curves, [443](#)

Permeation rate, [443](#)

Permeation resistance test methods, [427](#), [431](#)

Permeation test cells, [436](#)

Permeation theory, [428](#)

Personal protective clothing, [516](#)

Phase domain size, [123](#)

Phi-X174 bacteriophage, [520](#)

Photoacoustic spectroscopy (PAS), [250](#)

Photomultiplier, [374](#)

Physiological properties of the eye, [356](#)

Plastic or rubber films, [418](#)

Plastics, [395](#)

Plate height, [211](#)

Polarizing microscope, [102](#)

Polycarboxylic acids as cross-linking agents, [285](#)

Polyester, [395](#)

Polyethylene, [394](#), [395](#)

Polyethylene glycols as molecular probes, [272](#)

Polymer configuration, [19](#)

Polymer crystal, [37](#)

Polymer molecular conformation, [37](#)

Polymer molecular weight, [32](#)

Polymer morphology, [111](#)

domain size, [111](#)

interaction, [111](#)

organization, [111](#)

shape, [111](#)

Polymers, [2](#)

chemical structure, [2](#)

configuration, [2](#)

crystallinity, [2](#)

morphology,

orientation, [2](#)

physical structure, [2](#)

Polypropylene, [395](#)

Polyvinyl chloride, [394](#)

Pore dimensions, [295](#)

Pore length, [491](#)

Pore size distribution in cotton, [286](#), [271](#)

Pore structure in fibrous networks as related to absorption, [291](#)

Pore structure of a fiber assembly, [292](#)

Pore throat analysis, [302](#)

Pore throat dimensions, [295](#)

Pore volume distribution analysis, [297](#)

liquid extrusion porosimetry, [298](#)

liquid porosimetry, [298](#)

mercury porosimetry, [298](#)

Porosity and compression, [293](#)

Porosity determination by, [293](#)

direct gravimetric method, [293](#)

gas expansion, [293](#)

liquid imbibition, [293](#)

volumetric measurement, [293](#)

Porous barrier characteristics, [291](#)

Porous film reinforcements, [511](#)

Predication of comfort properties of fabrics, [353](#)

Predication of the making up of a suit, [353](#)

Predictive performance limits, [481](#)

Prescreening test, [504](#)

Pressure differential, [496](#)

Primary hand and its grading, [332](#)

Programmed color match predication technique, [378](#)

Protective clothing, [7](#), [492](#)

Protective clothing industry practices, [406](#)

Protective clothing materials, [403](#)

Protective properties of films, [511](#)

Protective properties of textiles against microorganisms, [496](#)

Q

Quantitative analysis of textile finishing processes, [208](#)

R

Raman spectroscopy, [11](#), [40](#), [107](#)

Recommended use of degradation testing, [407](#)

Reference illuminant, [358](#)

Relaxation measurements, [130](#)

Reporting of permeation data, [454](#)

Respiratory protection, [470](#)

Reverse gel permeation column chromatography, [266](#)

Risk reduction analysis, [543](#)

Risk reduction strategies, [517](#), [543](#)

Runoff-based penetration test methods, [411](#), [412](#)

S

Sample preparation and measurement of color, [376](#)

fluorescence, [377](#)

sample format, [376](#)

sample opacity, [376](#)

sample planarity, [376](#)

sample temperature and moisture content, [376](#)

thermochromic and photochromic property, [376](#)

Saranex, [395](#)

Scouring/bleaching, [279](#)
Segmental conformation in polymers, [37](#)
Selection of color measuring instruments, [369](#)
Selection of test methods to characterize barrier materials, [457](#)
Sensitivity of the detector, [219](#)
Sephadex as a model for cellulose, [268](#)
Shear modulus of fiber, [319](#)
Single fiber measurement, [311](#)
Single-fiber extension measurement, [316](#)
Single-use versus multiple-use products, [540](#)
Skin-core in polymers, [53](#)
Small-angle x-ray scattering (SAXS), [111](#), [112](#)
Small force and deformation, [311](#)
Sodium lamps, [356](#)
Solution stability, [6](#)
Solution viscosity, [34](#)
Sources of technical information on color science, [386](#)
Special metamerism index, [358](#)
Specific heat, [71](#)
Spectral absorption, [356](#)
Spectral distribution, [356](#)
Spectral power distribution, [357](#), [358](#)
Spectral range, [369](#)
Spectral reflectance curves, [357](#)
Spectral reflectance factor, [358](#)
Spectral reflection, [356](#)
Spectral transmission, [356](#), [358](#)
Spectrophotometer, [366](#), [369](#)
Spectroscopic analysis of durable-press agents, [247](#)

Spherulites, [124](#)
Splashing, [482](#)
Spraying, [482](#)
Spun-bonded polyethylene, [395](#)
Standard illuminates, [358](#)
Standardized air, liquid, and microbial challenge test, [542](#)
Standards pertaining to chemical barrier performance, [396](#)
Steam sterilization, [470](#)
Sterile packaging, [470](#)
Stress relaxation, [107](#)
Structure elucidation of cotton, [277](#)
Structure of porous network, [308](#)
Subjective hand judgment, [330](#)
Substitutional groups, [10](#)
Surface tension of liquids, [483](#)
Surgical end-use applications, [497](#), [498](#)
Sweating guarded hot plate, [493](#)
Synthetic blood formulation, [502](#)

T

Tailoring process control, [353](#)

Teflon film, [395](#)

Tensile strength, [316](#)

Textile analysis, [207](#)

Textile barriers, [482](#)

Textile characterization, [1](#)

Textile composites, [510](#)

Textile material as stationary phase, [208](#)

Thermal equilibrium, [493](#)

Thermal insulative properties, [492](#)

Thermal manikin, [493](#)

Thermal protection, [481](#)

Thermal stability of textiles, [481](#)

Thermally stimulated creep, [34](#)

Thermogravimetric analysis, [401](#)

Thin-layer chromatography, [239](#)

Three-dimensional polymeric networks, [237](#)

Three-dimensional solubility parameter, [403](#)

Torque-torsional angle relation, [321](#)

Torsion of a single fiber, [321](#)

Total color difference (ΔE_{TCI-29}^*), [365](#)

Total hand and its grading, [333](#)

Total surface area, [295](#)

Total void volume, [272](#), [275](#)

Transmission electron microscopy (TEM), [119](#)

Transmission of infectious microorganisms, [516](#)

Transmission of microorganisms, [471](#)

Transverse compression curves, [319](#)

Transverse modulus of fiber, [316](#)

Tristimulus colorimeter, [367](#), [371](#)

Tristimulus values (X, Y, Z), [358](#)

Two-layer composites, [510](#)

U

Ultraviolet spectroscopy (UV spectroscopy), [16](#)

Ultraviolet-visible spectrophotometry, [207](#), [247](#)

Unit cell, [37](#)

Use and interpretation of permeation testing, [454](#)

V

Vapor penetration, [6](#)

Vapor transmission test, [431](#)

Vapor-barrier performance of materials, [460](#)

Viscosity of liquids, [491](#)

Visible spectroscopy, [16](#)

Visible spectrum, [356](#), [358](#)

Visual system, [356](#)

Viton, [394](#)

Void (pore) structure, [116](#)

W

Washburn equation, [490](#)

Water repellency, [410](#)

Water resistance, [410](#)

Waterproofness, [410](#)

Wet processing environment, [207](#)

Wettability behavior of textiles, [488](#)

Whiteness evaluation, [382](#)

X

X-ray diffraction, [46](#), [51](#), [92](#)

X-ray unit cell characterization, [38](#)

Y

Yellowness evaluation, [383](#)

Young's modulus, [313](#)