Appendix

Physicochemical Constants

0° C = 273.16 K
R gas constant = 1.987 cal deg^{-1} $mole^{-1}$
Standard gravity = 980.66 cm sec^{-2}; 9.8066 N/Kg
Faraday's constant = f = 23,062 cal (volt equivalent)$^{-1}$
Avogadro's constant = N = 6.0238×10^{23} molecules $mole^{-1}$
Density of hair = 1.32 g cm^{-3}
Refractive index of hair:
Epsilon = 1.56 (light parallel to fiber axis)
Omega = 1.55 (light perpendicular to fiber axis)
Elastic moduli at 60–65% RH for Caucasian hair:
Stretching = 3.89×10^{10} dyn/cm^2 = 3,890 MPa
Bending = 3.79×10^{10} dyn/cm^2 = 3,790 MPa
Torsion = 0.89×10^{10} dyn/cm^2 = 890 MPa[a]

[a]Bogaty HJ (1967) J Soc Cosmet Chem 18:575

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Approximate Diameter of a Few Keratin fibers

Fiber type	Diameter (μm)
Human scalp hair	
Terminal hair	30–120 (See Chap. 9)
Vellus hair	<4
Wool fiber	
Fine wool	17–33[a]
Coarse wool	33–42[a]
Horse hair	
Mane	50–150[a]
Tail	75–280[a]
Cat whisker	~450
Porcupine quill	can be >1,000

[a]Harris M (ed) (1954) Harris handbook of textile fibers. Harris Research Labs., Washington, DC

Units of Linear Measure

Unit	Symbol	Quantity
Meter	m	–
Centimeter	cm	10^{-2} m
Millimeter	mm	10^{-3} m
Micrometer	μm	10^{-6} m
Nanometer	nm	10^{-9} m
Angstrom	Å	10^{-10} m
Picometer	pm	10^{-12} m

Meter is the arbitrarily chosen standard of length of the metric system. It is the distance between two marks on a platinum-iridium bar kept at constant temperature at the International Bureau of Weights and Measures near Paris. For conversion to the English system, 1 m equals 39.37 in. and 1 cm equals 0.3937 in. (2.5401 cm = 1 in.), etc.

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