



Standard Terminology of Microscopy¹

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€¹ NOTE—Keywords were added editorially March 2000.

Abbe condenser—see **condenser, Abbe**.

aberration—any error that results in image degradation. Such errors may be chromatic, spherical, astigmatic, comatic, distortion, or curvature of field; and can result from design or execution, or both.

achromatic—literally, color-free. A lens or prism is said to be achromatic when corrected for two colors. The remaining color seen in an image formed by such a lens is said to be secondary chromatic aberration.

achromatic objective—an objective that is corrected chromatically for two colors, and spherically for one, usually in the yellow-green part of the spectrum.

Airy disk—the image of a bright point object, as focused by a lens system. With monochromatic light, it consists of a central point of maximum intensity surrounded by alternate circles of light and darkness caused by the reinforcement and interference of diffracted rays. The light areas are called maxima and the dark areas minima. The distribution of light from the center to the outer areas of the figure was investigated mathematically by Sir George Airy. The diffraction disk forms a basis for determining the resolving power of an ideal lens system. The diameter of the disk depends largely on the aperture of the lens. The diffraction of light causing the Airy disk is a factor limiting the resolution of a well corrected optical system.

analyzer—an optical device, capable of producing plane polarized light, used for detecting the state of polarization.

ångström unit—a unit of linear measure named after A. J. Ångström. It is 1×10^{-10} metres; $1 \mu\text{m} = 10,000 \text{ Å}$. It is generally abbreviated as Å. in the United States; elsewhere, it is variously abbreviated Å, A., A.U., Å., or ÅU.

angular aperture—see **aperture, angular**.

aperture, angular—the angle between the most divergent rays that can pass through a lens to form the image of an object.

aperture, effective—the diameter of the entrance pupil; it is the apparent diameter of the limiting aperture measured from the front.

aplanatic—corrected for spherical aberration and coma.

apochromatic objective—a lens system whose secondary chromatic aberrations have been substantially reduced. (See *achromatic*).

axis, optical—the line formed by the coinciding principal axes of a series of optical elements comprising an optical system. It is the line passing through the centers of curvature of the optical surfaces.

axis, optic—the direction, or directions in an anisotropic crystal along which light is not doubly refracted.

balsam, Canada—a resin from the balsam fir *Abies balsamea*. Dissolved in xylene, toluene, or benzene it is used as a mountant for permanent microscopical preparations. Its refractive index may vary from 1.530 to 1.545 and its softening point from room temperature to 100°C, these properties varying with age and solvent content. If impure it discolors with age.

Bertrand lens—see **lens, Bertrand**.

bisectrix, acute—in biaxial crystals, that principal axis of the ellipsoid of indexes which bisects the smaller angle between the optic axes.

bisectrix, obtuse—in biaxial crystals, that principal axis of the ellipsoid of indexes which bisects the larger angle between the optic axes.

calcite—a doubly refracting mineral used in the manufacture of polarizing prisms. It is uniaxial negative and in the trigonal diversion of the hexagonal system of crystals. Its indexes are $\epsilon = 1.486$, $\omega = 1.658$; its hardness is 3 on the Mohr scale and specific gravity 2.711.

Canada balsam—see **balsam, Canada**.

chromatic aberration—a defect in a lens or lens system as a result of which the lens possesses different focal lengths for radiation of different wavelengths.

collimation—the operation of controlling a beam of radiation so that if the light source were a point, the light rays would become parallel. The total bundle of rays diverge as the source size increases.

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