

SERPENTINE

Monoclinic. In distinct crystals, but only as pseudomorphs. Sometimes foliated, folia rarely separable; also delicately fibrous, the fibers often easily separable, and either flexible or brittle. Usually massive, but microscopically finely fibrous and felted, also fine granular to impalpable or cryptocrystalline; slaty. Crystalline in structure but often by compensation nearly isotropic; amorphous.

X-ray analysis of chrysotile shows that it is composed of bundles of parallel fibers, but although the individual fibers are elongated parallel to one crystallographic direction (c axis) their orientation otherwise varies. The structure is monoclinic. Four molecules of $H_4Mg_3Si_2O_{10}$ in the unit cell. Each silicon atom is surrounded by four oxygen atoms arranged at the points of a tetrahedron, a part of the oxygen atoms being shared by neighboring tetrahedral groups. Together these groups form chains extending parallel to the vertical axis. The chains are similar to those of the amphiboles with the composition Si_4O_{11} . The binding forces between these chains are weak thus accounting for the fibrous structure. The arrangement of the Mg and OH groups is similar to that in brucite.

Cleavage b(010), sometimes distinct; also prismatic (50°) in chrysotile. Fracture usually conchoidal or splintery. Feel smooth, sometimes greasy. H. = 2.5-4, rarely 5.5. G. = 2.50-2.65; some fibrous varieties 2.2-2.3; retinalite, 2.36-2.55. Luster subresinous to greasy, pearly, earthy; resin-like, or wax-like; usually feeble. Color leek-green, blackish green; oil- and siskin-green; brownish red, brownish yellow; none bright; sometimes nearly white. On exposure, often becoming yellowish gray. Streak white, slightly shining. Translucent to opaque.

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E. FIBROUS. Chrysotile. Delicately fibrous, the fibers usually flexible and easily separating; luster silky, or silky metallic; color greenish white, green, olive-green, yellow and brownish; G. = 2.219. Often constitutes seams in serpentine. It includes most of the silky amianthus of serpentine rocks and much of what is popularly called asbestos (asbestus).

Copied from - Dana, E. S. and W. E. Ford, A textbook of mineralogy. John Wiley, N. Y. 4th ed. 1932, p. 674