Distinguishing Mineralogical and Analytical Properties of Asbestiform and Nonasbestiform Habits of the Same Minerals

ASBESTOS - ASBESTIFORM HABIT

CLEAVAGE FRAGMENTS – NONASBESTIFORM HABIT

Long Fibers typically show curvature Fibers have parallel sides Fiber length is independent of width Very thin fibers typically less than 0.5 microns Very high length to width aspect ratios typically 20:1 to 100:1 or higher for fibers longer than 5 microns Under PLM, monoclinic amphibole fibers show parallel extinction or extinction angles less than characteristic; for tremolite, actinolite and ferroactinolite fibers the maximum extinction angle is less than 10 degrees. Under PLM, fibers exhibit lower than characteristic birefringence (N-n) Under EM, the ends of fibers are perpendicular No curvature present Notched ends common. Two directions of clear produces parallel sides, but may be notched Length is dependent upon width with longer particles being wider Fragments rarely thinner than 0.5 microns for 5 microns and longer Low length to width aspect ratios typically und 20:1 for fragments 5 microns and longer Under PLM, fragments of monoclinic amphibos show characteristic oblique extinction and a maximum extinction angle (characteristic) of gragments show characteristic birefringence (N-n) Under EM, the ends of fragments are tapered irregular		
Formed in bundles of fibrils with splayed ends Long Fibers typically show curvature Fibers have parallel sides Fiber length is independent of width Very thin fibers typically less than 0.5 microns Very high length to width aspect ratios typically 20:1 to 100:1 or higher for fibers longer than 5 microns Under PLM, monoclinic amphibole fibers show parallel extinction or extinction angles less than characteristic; for tremolite, actinolite and ferroactinolite fibers the maximum extinction angle is less than 10 degrees. Under PLM, fibers exhibit lower than characteristic birefringence (N-n) Under EM, the ends of fibers are perpendicular Formed as single crystals never exist as bund. No curvature present Notched ends common. Two directions of clear produces parallel sides, but may be notched Length is dependent upon width with longer particles being wider Fragments rarely thinner than 0.5 microns for 5 microns and longer Low length to width aspect ratios typically und 20:1 for fragments 5 microns and longer Under PLM, fragments of monoclinic amphibos show characteristic oblique extinction and a maximum extinction angle (characteristic) of gragments show characteristic birefringence (N-n) Under PLM, fragments show characteristic birefringence (N-n) Under PLM, fragments show characteristic birefringence (N-n) Under EM, the ends of fragments are tapered irregular	Formed by growth	Formed by fracturing rock
Fibers have parallel sides Fiber length is independent of width Very thin fibers typically less than 0.5 microns Very high length to width aspect ratios typically 20:1 to 100:1 or higher for fibers longer than 5 microns Under PLM, monoclinic amphibole fibers show parallel extinction or extinction angles less than characteristic; for tremolite, actinolite fibers the maximum extinction angle is less than 10 degrees. Under PLM, fibers exhibit lower than characteristic birefringence (N-n) Under EM, the ends of fibers are perpendicular No curvature present Notched ends common. Two directions of clear produces parallel sides, but may be notched Length is dependent upon width with longer particles being wider Fragments rarely thinner than 0.5 microns for 5 microns and longer Low length to width aspect ratios typically und 20:1 for fragments 5 microns and longer Under PLM, fragments of monoclinic amphibos show characteristic oblique extinction and a maximum extinction angle (characteristic) of gragments show characteristic birefringence (N-n) Under EM, the ends of fragments are tapered irregular		Formed as single crystals never exist as bundles
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Very high length to width aspect ratios typically 20:1 to 100:1 or higher for fibers longer than 5 microns Under PLM, monoclinic amphibole fibers show parallel extinction or extinction angles less than characteristic; for tremolite, actinolite and ferroactinolite fibers the maximum extinction angle is less than 10 degrees. Under PLM, fibers exhibit lower than characteristic birefringence (N-n) Under EM, the ends of fibers are perpendicular 5 microns and longer Low length to width aspect ratios typically und 20:1 for fragments 5 microns and longer Under PLM, fragments of monoclinic amphibor show characteristic oblique extinction and a maximum extinction angle (characteristic) of gragments show characteristic birefringence (N-n) Under EM, the ends of fragments are tapered irregular	Fiber length is independent of width	
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parallel extinction or extinction angles less than characteristic; for tremolite, actinolite and ferroactinolite fibers the maximum extinction angle is less than 10 degrees. Under PLM, fibers exhibit lower than characteristic birefringence (N-n) Under EM, the ends of fibers are perpendicular show characteristic oblique extinction and a maximum extinction angle (characteristic) of grammum extinction angle (characteristic	20:1 to 100:1 or higher for fibers longer than 5	Low length to width aspect ratios typically under 20:1 for fragments 5 microns and longer
birefringence (N-n) Under EM, the ends of fibers are perpendicular Under EM, the ends of fragments are tapered irregular	parallel extinction or extinction angles less than characteristic; for tremolite, actinolite and ferroactinolite fibers the maximum extinction angle is	maximum extinction angle (characteristic) of greater
Under EM, the ends of fibers are perpendicular Under EM, the ends of fragments are tapered irregular	Under PLM, fibers exhibit lower than characteristic	
Under TEM, uniform internal diffraction contours		Under EM, the ends of fragments are tapered or irregular
	Under TEM, uniform internal diffraction contours	Under TEM, irregular or wavy diffraction contours