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

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