

# Differentiating Amphibole Asbestos from Non-Asbestos in a Complex Mineral Environment

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## Key Words

Amphibole · Asbestos · Characteristics · Flowchart ·  
Cleavage fragment

## Abstract

Extending the TEM methods designed for the evaluation of atmospheres in which any primary mineral fibers present are derived from a commercial asbestos fiber is a challenging task. This is because the methods employed leave it to the expertise of the user to identify and evaluate interferences. Improper analysis of non-construction materials for asbestos content often results in the misidentification of non-asbestos amphibole particles as asbestos fibers. These errors have received widespread publicity in the media (such as the asbestos-in-crayons story) and have caused unwarranted reformulation of harmless products. The primary cause of these errors has been a poor understanding of mineralogy and analytical techniques among the many asbestos laboratories that arose following the passage of the 'Asbestos Hazardous Emergency Response Act' (AHERA) regulations. This study outlines a procedure based on published data that can be used to correctly

classify a microscopic, elongated particle as either asbestos or non-asbestos.

## Introduction

'Asbestos' is a commercial term applied to a group of naturally occurring minerals that have grown in a specific crystal habit and exhibit characteristics of flexibility, high tensile strength, large surface area, electrical resistance, and resistance to heat and chemical degradation. 'Asbestos' minerals are also capable of being manipulated, woven, or otherwise handled with minimal degradation of the fiber length. These minerals were originally defined by the characteristics of hand specimens and by their optical properties when examined using a polarized light microscope (PLM). The principal differences between commercial and non-commercial asbestos deposits are the size of the deposit and quality of fiber. The commercial fibers have been regulated as their health effects have become understood.

There are six minerals specifically regulated as asbestos by the Federal government, chrysotile (fibrous serpentine)