

Comments on
Asbestos and Other Minerals

Roadmap for Scientific Research

by

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Is there anything new in the roadmap?

- NIOSH's focus on expanding the definition of asbestos to include other fiber-types and cleavage fragments has a long history.

Others have addressed this issue

- CPSC – 2-4% Tremolite Asbestos in Children’s Play Sand (1986) NEJM.
- 2-4% of the tremolite was blocky and only about 0.01% was fibrous but not asbestos.
- Scientific evidence was insufficient to regulate the cleavage fragments as asbestos.
- CPSC’s Chair likened calling “cleavage fragments asbestos to hollering fire in a crowded theater.”

OSHA had a Rule Making(1992)

NIOSH proposed a policy to OSHA almost identical to that found in the roadmap.

OSHA decided non-asbestos amphibole minerals should not be regulated as asbestos.

OSHA's Points

- No evidentiary basis to support the cleavage fragments (having the same morphology as asbestos) present a hazard similar to asbestos.
- Populations of cleavage fragments and asbestos can be distinguished.
- For most mineral deposit asbestos and nonasbestiform habit are distinguishable.

OSHA on Definitions

- Recommended non-asbestiform fibers should be defined using common mineralogical usage.
- OSHA does not recognize NIOSH's efforts to define asbestos – policy and analytical component.
- In the roadmap NIOSH discusses science but is developing definition based on policy needs?

NIOSH Definition of Asbestos

- Regulatory Definition –both policy and analytical components.
- NIOSH and other federal agencies have no scientific basis for developing mineral definitions.
- Mineralogist and others have developed the science used to identify minerals.

OSHA found the following

Mineral fiber should be regulated based on using mineralogical criteria to define them rejecting NIOSH's position that similarity in morphology is an acceptable criteria for inclusion in the asbestos standard.

Libby, Montana

Health Effects at
Libby are Asbestos-Related.

Libby fibers identified predominantly as winchite and richterite as well as tremolite asbestos. Roadmap quoting Meeker et al. (2003)

Libby Asbestos

Our analysis by analytical transmission electron microscopy found at least half of the asbestiform fibers from the vermiculite mine were in the tremolite-actinolite series and could be regulated asbestos.

Libby fibers provide no information about cleavage fragments. Nolan et al. (1991)

Fibrous Erionite

- The inhalation of fibrous erionite (0.6 million fiber/milliliter hours) by rats produced 96.6% mesothelioma and no lung cancers. Crocidolite (in the same experiment at 6 million fibers/milliliter hours) produced no mesotheliomas and 3.6% lung cancer. The two fiber-types had size distribution that were almost identical.
- We know of no human mesothelioma in the US associated with exposure to fibrous erionite.

Fibrous Talc

- Stanton et al. 1981 produced 100% tumor probability with two tremolite asbestos samples with 1380 and 692 fibers per microgram with ≤ 0.25 microns and ≥ 8 micron. A similar dose of fibrous talc (1995 fibers per microgram with ≤ 0.25 microns and ≥ 8 micron) produce no tumors.

Unified Fiber Theory

- From the experimental studies already in the literature indicate that morphology and biopersistence are not the keys to explaining fiber carcinogenesis.
- Both erionite and fibrous talc are thought to be biopersistent. Yet one is a powerful animal and human carcinogen and the other is not.

Expanding the Definition of Asbestos

- Hodgson and Darnton (2000) produced asbestos fiber-type specific risk assessments for human mesothelioma where the chrysotile: amosite : crocidolite increased in the carcinogenicity by 1:100:500.
- Do these three fiber-types belong in the same standard?

The Roadmap Comments on the continued use of Asbestos

- Worldwide amosite and crocidolite asbestos are no longer in commerce.
- Chrysotile asbestos continues to be used and contrary to NIOSH opinion about the low cost others may be impressed by the low health hazard associated with the controlled use of this asbestos fiber-type.

Asbestosis and Mesothelioma in the United States

- The NIOSH Roadmap claims 1,400 asbestosis death each year. Has been increasing since 1968.
- Indicates in Figure 4 there were over 4,000 mesothelioma in the US in 2004 and in the text below reports the number as 2,657 mesothelioma in 2004.