

Report on Session B: Morphological Criteria for Identification of Mineral Fiber in Cosmetics Containing Talc. Available Mineral Standards.

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The goal of Session B was to “establish concurrence on morphological criteria for identification of mineral fibers in the analysis of cosmetics containing talc.” The discussions that ensued were for the most part based on information provided in the morning’s presentations with some discussions new and broader in subject scope.

Agreement was reached that particles must be greater than 5 μm in length, with an aspect ratio (L : W) of 3 : 1 or greater to be characterized as “fiber” for monitoring purposes. Such particles are also known as EMPs. We also agreed that longer EMPs provide more information that permits the analyst to distinguish between an asbestos fiber and a non-asbestos particle (a fragment) with EMP morphology. These longer EMPs exhibit morphological and physical properties that are measurable and permit distinguishing among forms.

Morphological criteria (length and aspect ratio) were incorporated in the Federal Asbestos Standard as a useful guide for indexing asbestos exposure in the workplace. Outside of the asbestos-handling workplace, these criteria are less helpful as they lead to “false positives” in assays and exaggerate possibility of an asbestos hazard. We agreed and urged that the FDA establish morphological criteria for the identification of asbestos in bulk and cosmetic talc different from those used for indexing exposure to known asbestos.

The use of polarized light microscopy with immersion oils with a suitable range of indices of refraction should be employed in the analysis of bulk samples. The instrument allows the analyst to

distinguish among the mineral forms based on morphology, indices of refraction, and optical properties evident in polarized light. We discussed the issue of “asbestos free” designation of a product and we agreed this is not possible as the analyst is driven to prove the negative, an impossible task.

We agreed that the measurement of a particle population exhibiting lengths $> 5 \mu\text{m}$, and widths less than $1.5 \mu\text{m}$, may be useful in distinguishing between asbestos and non-asbestos fragments of the same mineral. We agreed that the number of particles required for this determination ranged between 50 and 300 although the number may vary in the establishment of a modal class of particles. We agreed that the modal classes for amphibole asbestos widths lie far below the classes measured for amphibole cleavage fragments. The tail overlap of their distributions is trivial.

We agreed that laboratory techniques existed that improve detection of mineral fibers in talc. Heavy liquid concentration of amphibole fiber and fragments has been used in the past.

We had begun discussion of costs employing analytical transmission microscopy in the analysis of fibers in cosmetic talc. Time to acquire morphological, chemical, and structural data for a single particle, and the interpretation of the results, were factors. We also explored the possible risk analysis that might be associated with particles in tissues. None of these issues achieved sufficient discussion to reach any agreement.