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TITLE: DIFFICULTIES ENCOUNTERED IN THE IDENTIFICATION OF ASBESTOS FIBERS BY ANALYTICAL TRANSMISSION ELECTRON MICROSCOPY

INFORMATIVE SUMMARY WITH CONCLUSIONS

Large variation is often observed in inter-laboratory determinations of the asbestos concentrations in water and air. The reasons for and means of minimizing this variation are discussed. The fiber losses that occur during sample preparation and filter extraction are large and variable (10-60%) and depend on the fiber type and extraction method used. Fiber losses can be minimized by using short extraction times and/or gentle extraction techniques. Asbestos morphology is distinctive but not sufficiently so to allow positive morphological identification in environmental samples. Selected area electron diffraction patterns are often indistinct and the fraction of asbestos fibers giving identifiable diffraction patterns depends on the fiber size distribution and instrumental parameters. This problem is particularly serious in studying chrysotile fibrils. Large variations in concentration are encountered when the sample contains a significant number of fiber clumps, bundles or networks because guidelines for counting complex fiber configurations have not been established. It is difficult to maintain good counting statistics when the quantity of material analyzed corresponds to parts per billion of asbestos and samples of less than 100 ml must be used. When these problems are avoided the variation in multiple analysis is generally better than ± 30.%.

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