Improved Techniques of Identification and Determination of Airborne Asbestos

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Collection, identification and data analyzing techniques are presented for airborn mineral fibers. The limitations of the techniques are discussed. It is shown that the adaption of a plenum 1¾ inches long for sample collection is important since it leads to a much more uniform particle collection and distribution. Separation of the asbestos particles from other solid airborn pollutants with the refractive index liquid method is shown to be accurate, convenient and useful in distinguishing asbestos from other fibrous material. For analysis of this type the image analyzing microscope is a very valuable tool.

Introduction

THE NEED TO EVALUATE THE HAZARDS from asbestos inhalation was recognized as early as 1906 but it was more than twenty years before a detailed description of asbestosis was developed. Since then, it has been documented by numerous studies that inhalation of high concentrations of asbestos or any prolonged exposure to moderate asbestos dust level can in many instances lead to the development of asbestos connected diseases of the lung.[1]

In general, the available data and information are only pertinent to the high concentrations caused by occupational exposure, and not to the low asbestos fiber content found as background in air. The health problem as posed by the biologically active asbestos fibers has led to the establishment of occupational safety standards.[2] But, little has been done to develop reliable sample collection, data generation, and identification techniques. This paper deals with these three aspects of analyzing for airborne asbestos particles.

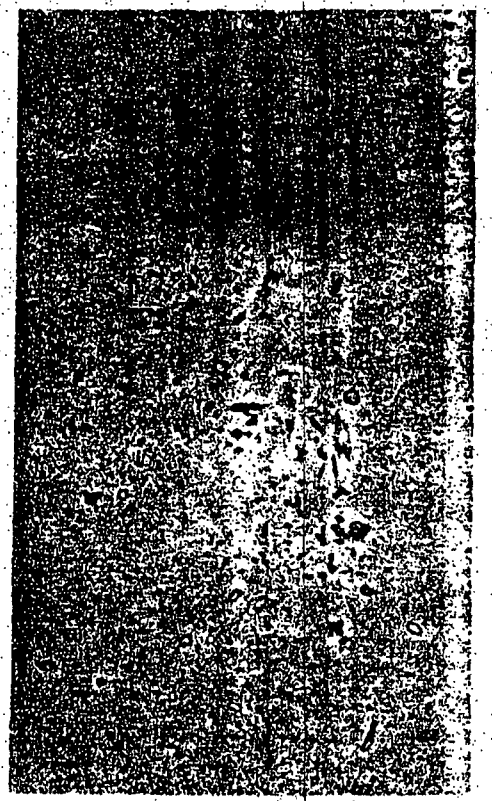

Figure 1. Non-uniform particle distribution of asbestos fibers and dust, collected with an open-face filter holder and viewed at 500X, phase contrast. (Sample A).

Sampling

Sample collection is the most important step in any analysis for air pollution. Therefore, one must be sure that the collection