Development of Automated Asbestos-Monitoring System Using Fluorescent Microscopy and Its Application to Analysis of Asbestos Dispersion at Demolition Sites

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[Abstract]

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  The official method for the detection of airborne asbestos using an electron microscope is time-consuming and labor-intensive, making it unsuitable for asbestos monitoring at demolition sites. To address this issue, the principal investigator developed a fluorescence microscopy (FM) method for the detection of airborne asbestos using an asbestos-specific fluorescent reagent. In this study, the entire process from air sampling to measurement using the FM method was automated to detect airborne asbestos not only automatically but also continuously. The developed device could effectively detect an airborne asbestos dispersion at asbestos removal sites. Because the dispersion was detected within approximately 20-30 min, it was concluded that the device is sufficiently capable for detecting asbestos at demolition sites. To accurately measure asbestos at a level of 1 fiber/L in a general environment, longer air sampling times (e.g., 120 min) are necessary. Further improvement of the detection rate and the practicality of the device will be the focus of future research.

[References]

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