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A review of different methods for identifying World Trade Center dust in buildings.

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Abstract:
The explosion and collapse of the World Trade Center (WTC) produced an aerosol plume of dust and smoke that impacted several buildings in lower Manhattan. Because of the potential health risks associated with the WTC collapse, a method for identifying WTC dust is needed to understand the nature and extent of WTC dust contamination and to prioritize cleanup for impacted buildings. Various methods for identifying WTC dust have been proposed in the literature. WTC dust signatures based on asbestos, man-made vitreous fibers (MMVF), heavy metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzodioxins and furans (PCDD/Fs), and a combination of asbestos, MMVF, and heavy metals have been proposed. For this review, each method was evaluated based on three criteria: the components of the signature were unique from background; the components of the signature are specific to WTC dust regardless of sampling location or conditions; and the components are commonly analyzed constituents of indoor dust. Of the six WTC dust identification methods identified and reviewed, two methods were determined to be useful for identifying WTC dust based on these criteria. A method that identifies WTC dust as dust with MMVF concentrations above background performs well based on these criteria, but MMVF was not a commonly analyzed constituent at the time of the WTC collapse. Because of this, MMVF may not have been measured during building investigations that were performed within a year following the WTC collapse, which limits its usefulness to current and future investigations. Another method that identifies WTC dust using a multivariate statistical model based on heavy metal concentrations also performed well when applied using the best available background indoor dust data set. While MMVF is useful for current and future investigations, the metals included in the statistical model were more likely to have been measured in most building investigations following the WTC collapse, making this method the preferred method when evaluating data from past investigations.
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