C42 Dust Particulate From the World Trade Center Disaster of September 11, 2001

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After attending this presentation, attendees will be provided information about how the microscopical analysis of dust particles from the World Trade Center Disaster of September 11, 2001, can be used to compare with dust from other sources.

This presentation will impact the forensic community and/or humanity by showing the differences between WTC dust and other dusts from other sources in indoor environments thereby helping to provide the scientific information necessary for judicial decisions.

The results of the microscopical analysis of dust samples collected within a short time after the 11 September 2001 attack on the World Trade Center buildings in New York City show that the dust was composed primarily of construction debris containing glass fibers, plaster, and cement particles as well as soot, wood particles, paper, and cotton fibers. Based on a number of samples and a number of different types of analyses including polarized light microscopy, scanning and transmission electron microscopy, and FTIR microscopy, the general composition of the WTC dust was found to be: Glass fibers (primarily mineral wool) - 35 – 40 %, Gypsum particles - 25 – 30 %, Cement/Calcium-containing particles - 10 – 15 %, Cellulose (paper, cotton, wood fibers) - 5 – 10 %, Combustion Products (soot and char) - 1 – 10 %, Crystalline Silica ~ 6 %, Asbestos (primarily chrysotile with some amosite and tremolitic) - < 1 – 2 %, Other Material Classes (paint, metal, vermiculite, glass shards) <1 % per class.

All the classes of components in the WTC dust have been found in other residential and office dust samples but the population of small particles containing a combination of a high amount of glass fiber, a high amount of construction debris material (plaster/cement) and obvious presence of combustion product particles (both char and soot) serves as a distinguishing characteristic of WTC dust when compared to most typical residential or office dusts. Pieces of asbestos large enough to be seen with the light microscope are also a characteristic of some WTC dust samples because large asbestos particles are not seen in normal building dust samples. With the exception of some elongated calcium/sulfur/silicon particles described in Millette, et al., 2002, all the types of particles in the WTC dusts have been reported as associated with normal dusts. At this time, no single particle type is considered a signature particle for WTC dust.

Dust, Microscopy, WTC

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