

EVALUATING LEVELS OF AIRBORNE DUST IN SYNTHETIC ORGANIC FIBER MANUFACTURING FACILITIES

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Abstract

Methods for evaluating exposure to airborne synthetic vitreous fibers (SVFs) and asbestos have been standardized for more than a decade. However, there are no validated methods for evaluating airborne synthetic organic fiber (SOF) levels. Major differences between SVFs and SOFs (SOFs tend to be less dense, curly, and have a static charge) suggest that rules for evaluating SVFs and criteria for their respirability may not directly apply to SOFs. Thus, we investigated 3 methods for monitoring airborne fiber levels generated during the manufacture of polyolefin fibers. Simultaneous samples were collected using (a) personal 8-stage cascade impactors, (b) personal air samplers with methylcellulose filters, and (c) personal air samplers with Nuclepore[®] filters. Fibers from a-b were counted using optical microscopy (OM). Fibers from c were counted and measured using scanning electron microscopy (SEM) at 2000X. Conclusions were: (a) SOFs with diameters $\leq 6 \mu\text{m}$ may be respirable (in contrast to diameters $< 3 \mu\text{m}$ for SVFs); (b) impactor results for SOFs did not reflect actual counts; (c) PCOM evaluation (NIOSH 7400 A Rules) was adequate for these samples; (d) adequacy of OM evaluation should be confirmed by collecting a sample on a Nuclepore[®] filter and analyzing using SEM.