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Ranges in respirable and inhalable dustiness and dustiness kinetics of nanomaterial powders as determined with the prototype small rotating drum – priority parameters for exposure assessment

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Abstract: The OECD WPMNM (Working Party on Manufactured Nanomaterials) has listed dustiness as a priority data for risk assessment of nanomaterials. To enable testing of small volumes and improve handling safety, Schneider and Jensen [1] developed a miniaturized version of the EN15051 rotating drum for nanomaterial testing. This small rotating drum (SRD) is now under standardization in CEN. Here, the results obtained on more than 80 different powders tested using the SRD are discussed in regard to the traditional mass-based respirable and inhalable dustiness indices, their size-characteristics, and dustiness kinetics. These are parameters deemed important for use of dustiness results in exposure assessment modeling under development in e.g., the EU FP7 project SUN. The results demonstrate an extreme range in dustiness levels and variations in dustiness kinetics from instant release to almost constant rate “emitters”. Recently, these two parameters were used product evaluation of pharmaceutical powder ingredients [2]. The observed dustiness characteristics indicates that grouping powders by dustiness indices is a difficult task and that the conventional dustiness categories established in EN15051 may need reconsideration.

Schneider T and Jensen KA. Ann. Occ. Hyg. 52/1, 23-24 (2008)

Levin M, Koponen IK, and Jensen KA. J. Occ. And Env. Hyg., 11/3, 165-172 (2014)

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