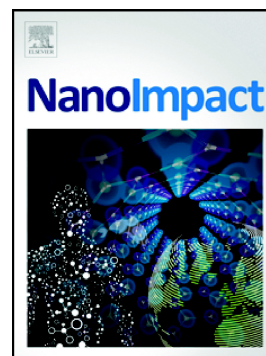


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Quantitative material releases from products and articles containing manufactured nanomaterials: Towards a release library

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Abstract

Environmental and human risk assessment models are critical for estimating the impact of nanomaterials on the ecosystem and human health. Realistic exposure estimates usually require quantitative process-specific release and emission characteristics in specific exposure situation. For nanomaterial-based products, release data suitable for modelling are currently very scarce. Consequently, in this study, we reviewed the release assessment literature and extracted or derived quantitative releases, as well as properties of released fragments from 374 different scenarios on nanomaterial-based products and articles, including artificial weathering, mechanical treatment, spraying, washing and leaching. The release literature has assessed textiles, thermosets, thermoplastics, coated surfaces, sprays, incineration, and other articles and the results are provided for different release processes. Artificial weathering of composites at a UV-dose of *ca.* 150 MJ m⁻² released 10¹ to 10⁵ mg·m⁻² fragments containing nanomaterials and *ca.* 10⁻⁴ to

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