Spectroscopic monitoring of the aging of sunscreens with TiO_2 UV filters

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Wood stains need to protect the wood from aging and increase its durability, especially when used as siding. In this context, protection from UV damage is a major issue. CeO2 nanoparticles act as UV filters that do not alter the coloring/staining properties of the product and have an increassed durability compared to organic UV filters. However, exposure to weathering agents (water, UV-Vis illumination, temperature…) can cause the release of the CeO2 nanomaterials, which are known to be of some ecotoxicological concern. Here we examine the released of CeO2 from wood stains under simulated environmental conditions. The aging scenarios (continuous immersion vs periodic spraying, illumination regime…)were found to have a strong influence on the release of Ce from the stain. The mechanisms of release are evolving with time, and are involving transformations of the CeO2 nanomaterial during the course of aging.