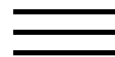


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Determination of selected UV filters in indoor dust by matrix solid-phase dispersion and gas chromatography-tandem mass spectrometry

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Abstract

A simple, inexpensive sample preparation procedure, based on the matrix solid-phase dispersion (MSPD) technique, for the determination of six UV filters: 2-ethylhexyl salicylate (EHS), 3,3,5-trimethylcyclohexyl salicylate (Homosalate, HMS), 3-(4-methylbenzylidene) camphor (4-MBC), isoamyl-*p*-methoxycinnamate (IAMC), 2-ethylhexyl-*p*-methoxycinnamate (EHMC) and octocrylene (OCR), in dust from indoor environments is presented and the influence of several operational parameters on the extraction performance discussed. Under the final working conditions, sieved samples (0.5 g) were mixed with the same amount of anhydrous sodium sulphate and dispersed

with 2 g of octadecyl bonded silica (C18) in a mortar with a pestle. This blend was transferred to a polypropylene solid-phase extraction cartridge containing 2 g of activated silica, as the clean-up co-sorbent. The cartridge was first rinsed with 5 mL of *n*-hexane and the analytes were then recovered with 4 mL of acetonitrile. This extract was adjusted to 1 mL, filtered and the compounds were determined by gas chromatography combined with tandem mass spectrometry (GC–MS/MS). Recoveries for samples spiked at two different concentrations ranged between 77% and 99%, and the limits of quantification (LOQs) of the method between 10 and 40 ng g⁻¹. Analysis of settled dust from different indoor areas, including private flats, public buildings and vehicle cabins, showed that EHMC and OCR were ubiquitous in this matrix, with maximum concentrations of 15 and 41 µg g⁻¹, respectively. Both UV filters were also quantified in dust reference material SRM 2585 for first time. EHS, 4-MBC and IAMC were detected in some of the analyzed samples, although at lower concentrations than EHMC and OCR.



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Keywords

UV filters; Dust; Indoor atmospheres; Matrix solid-phase dispersion; Gas chromatography–tandem mass spectrometry

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