

MUTAGENICITY OF FIRE-WATER RUNOFF FROM THE FIRE OF THE TYPICAL FURNISHING MATERIALS

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Abstract

This research is a pilot study aimed at assessment of potential risk caused by the contamination of soil and water by the fire-water runoff from the non-chemical facilitates. Our research addresses the first phase of the research – the assessment of the mutagenicity of fire-water runoff resulting from the fire of the typical furnishing materials: cellulose, furniture resins, PMMA and polyurethane foams. We prepared samples of these materials, then we burned them in controlled conditions and collected the extinguishing water for further tests. In each of the collected water samples, we determined the content of 16 PAHs and, using the Ames test, we determined the mutagenicity of these samples. Our studies clearly show that fire-water runoff is a serious risk factor not only for firefighters but for all the living organisms in the ecosystem as the water released during firefighting ends finally in the ground and waterbodies. The greatest risk is the water runoff deriving from the burning of polyurethane foam, which is found in a variety of consumer and commercial products such as bedding, furniture, automotive interiors, carpet underlay and packaging, etc. Due to the lack of evidence-based assessment of the impact of fire-water runoff from houses or public buildings, the problem should be investigated systematically.

Keywords: internal fires, building finishing materials, firefighting, contamination of the soil and water environment