**Effects of organic lining materials and plastic pipes to the chemical burden of drinking water**

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Clean drinking water is among the most important health issues in the world. Chemical contamination of drinking water can occur at several stages of its journey from source to tap. Drinking water distribution system can be one source of contaminants. Since water can reside in the distribution system for several days before reaching the user, the materials in distribution system have a great impact on water chemical content (Kekki et al. 2007).

Organic materials used in distribution system include pipes made of plastics, such as polyethylene (PE) and polyvinylchloride (PVC), and pipe inner surface lining materials, for example epoxy resins. Plastic pipes are common especially in new construction sites, whereas epoxy lining is an increasingly popular method for renovation of old water pipes. In recent years lining technique has been applied to household drinking water pipes due to its ease and suitability to narrow water pipes. The inner surface of the pipes are coated in situ using spray-on or cured-in-place techniques.

Organic pipe materials can leach chemicals with harmful health effects and cause unwanted taste or odor. Epoxy resins are known to leach bisphenol A or F among other chemicals (Bruchet et al 2014, Satchwill 2002). The quality of the lining process is important: poorly cured lining is very likely leaching chemicals (Pelto-Huikko&Kaunisto 2011). Plastic PE pipes leach, for example, methyl-tertbutyl ether (MTBE), ethyl-tertbutyl ether (ETBE), tert-butanol, 2,4-di-tert-butyl phenol (DTBP), and BTEX (Lund et al. 2011, Skjevrak et al. 2003, Kowalska et al. 2011). PVC pipes can leach vinyl cholride monomer (VCM) and organotin or lead metal stabilizers (Kekki et al. 2007, Kowalska et al. 2011).

Organic materials leach chemicals especially at the beginning of their use. However, their ageing process and long term leaching properties are poorly understood. In this research project chemicals in drinking water from buildings with different age epoxy coated or PE pipes are studied. Samples from drinking water treatment plants and municipal distribution system serve as comparisons for evaluating the effect of pipe materials to water quality. Samples are collected in the Czech Republic and Finland, and several organic volatile and non-volatile chemicals are monitored, such as bisphenol A and F, nonyl phenol, phthalates, BTEX, DTBP, MTBE, ETBE, TBA, VCM, total organic carbon, and total metals.

The investigation covers the impact of each pipe material and its age on water chemical burden, including assessment of possible risk of chemicals in different materials to humans and the environment.

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