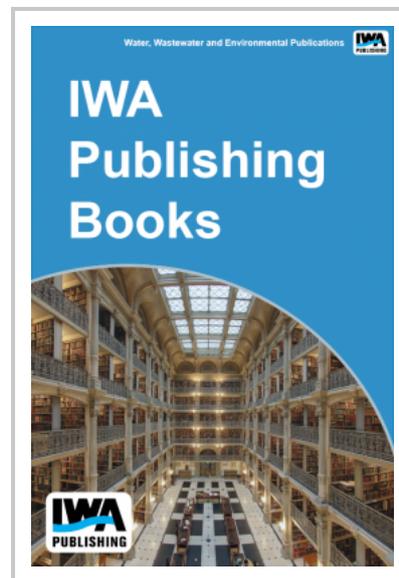


Trace Organic Compounds and Implications for Wastewater Treatment: Technical Brief

This Technical Brief has been prepared in response to concerns over the presence of trace organic compounds (TOrc) in wastewater, water supplies, and the receiving environment (Associated Press, 2008, WERF 2005, Ternes et al., 2004). The purpose of this brief is to summarize available scientific data on TOrc in wastewater and the receiving environment that can put these concerns into perspective. It begins with information on how we identify and measure the levels of TOrc, then describes the removal of TOrc in typical wastewater treatment processes. The potential human health and ecological effects of TOrc that may be discharged to surface waters and/or taken up in public water supplies is also evaluated. The brief identifies management strategies that are either being considered or implemented along with future research needs.

Our society uses tens of thousands of organic chemicals that may ultimately reach municipal wastewater treatment plants and then the surface waters and ground waters that receive treated effluent from those plants. Persistent TOrc can remain in surface water for time periods on the order of days to weeks or months, which allows time for these compounds to travel significant distances downstream. Recalcitrant TOrc in groundwater can persist for even longer periods of time. The land application of biosolids provides another potential pathway for release of TOrc. As a result, aquatic, terrestrial and human populations potentially may be exposed to persistent TOrc in the environment before these compounds attenuate.

The ability to detect and measure trace organics in the environment is a critical link to understanding their sources, potential effects, and removal options. The characterization of TOrc in environmental samples is no simple matter, given that approximately 63,000 chemicals are in common use worldwide and that authorities do not yet agree on which TOrc should be monitored in the environment. The analytical methods typically used for environmental characterization and regulatory purposes have predominantly addressed high-use industrial chemicals of demonstrated toxicity. With limited exceptions, these methods cannot satisfy measurement needs for the expanded universe of TOrc. Many individual chemicals have not been addressed in standard environmental analysis methods published by regulatory agencies, and sensitivity towards those that are included is often not adequate. An alternative to measuring TOrc concentrations in surface water, not discussed in detail in this Technical Brief, is modeling such concentrations.



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