



rpc

SCIENCE & ENGINEERING

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N-Nitrosodimethylamine (NDMA) Analysis

N-Nitrosodimethylamine (NDMA) has emerged as a contaminant of environmental and public health concern in North American drinking water. It has been found both in surface water and groundwater sources, but can be present in drinking water and wastewater primarily as a disinfection byproduct formed during the treatment process, in particular chloramination. To a lesser extent, chlorination and the use of some nitrogen-based coagulants and ion exchange resins also can result in its formation.

Drinking water disinfection can generate NDMA from various precursors. In raw water sources, these include humic and other nitrogen-organic substances such as dimethylamine, a common component of human and animal waste which can remain in water even after secondary wastewater treatment, thus causing concern in areas of water reuse and where sources of drinking water are impacted by wastewater effluent. For example, NDMA levels may be elevated in the drinking water of communities where source water contains excess nitrogen due to runoff from agricultural land. The nitrogen-containing herbicides thiram and diuron and fungicide tolylfluanide are also precursors that may lead to NDMA formation in drinking water.

NDMA is formed in the manufacturing process and storage of some other pesticides and thus can be released into the environment through the application of these substances in agriculture, hospitals and homes. NDMA is classified as a probable human carcinogen that also has been found in industrial processes, food products and tobacco smoke.

In 2011, Health Canada established a drinking water guideline at a maximum acceptable concentration (MAC) of 0.04 µg/L, based on an assessment by the Federal-Provincial-Territorial Committee on Drinking Water (CDW). As a result, regulators may require communities and other water supply owners to monitor NDMA concentrations in water treatment and distribution systems.

Analysis

Analysis is by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS), based on Ontario Ministry of Environment (MOE) Method NDMA-E3291A. Detection limits for water samples are in the range of 0.001 - 0.005 µg/L.

Qualifications

RPC's Analytical Services laboratories hold accreditation with the Standards Council of Canada (SCC). The laboratory accreditation program is based on the continued demonstration of performance as evaluated through interlaboratory proficiency testing and laboratory site audits. The laboratory's proficiency is also demonstrated through successful participation in interlaboratory studies coordinated by MOE.

RPC's quality management system is registered to ISO 9001.

Experience

RPC's high resolution mass spectrometry (HRMS) laboratory has been serving clients since 1992 and has built a reputation of performing NDMA analysis at the high level of quality required by clients and regulatory agencies. Service is personalized, reliable, confidential, and on-time.

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