

Nitrosamines: A review on their prevalence as emerging pollutants and potential remediation options

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Abstract

This review provides an overview of the current state of knowledge on the prevalence of nitrosamines in drinking water, especially nitrosodimethylamine (NDMA), and discusses published research on the detection, mechanisms of formation, and removal of nitrosamines. While the number of published reports in the South African context is very limited, this review also attempts to contextualise and report specifically on the challenges for South Africa. Besides direct industrial or human-derived contamination, nitrosodimethylamine can be formed through a chemical reaction between monochloroamine and an organic-based compound such as dimethylamine which is frequently detected in surface water. It has been suggested that chloramination of surface waters with a high concentration of dissolved organic carbon (DOC) could result in elevated NDMA formation. Growing evidence suggests that NDMA occurs more frequently and at higher concentrations in drinking water systems that practise chloramination compared to systems that use chlorination.

Keywords: drinking water, mechanisms of formation of nitrosamines, N-nitrosodimethylamine (NDMA)