

Home

Online Library DWES

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Library Search
- Title and Author Search

Online Library DWESD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

[Volumes and Issues](#) [Contents of Issue 2](#)

Drink. Water Eng. Sci., 2, 49-55, 2009

www.drink-water-eng-sci.net/2/49/2009/

doi: 10.5194/dwes-2-49-2009

© Author(s) 2009. This work is distributed under the Creative Commons Attribution 3.0 License.

Removal of radio *N*-nitrosodimethylamine (NDMA) from drinking water by coagulation and Powdered Activated Carbon (PAC) adsorption

J. Chung¹, Y. Yoon², M. Kim³, S.-B. Lee³, H.-J. Kim³, and C.-K. Choi³

¹R&D Center, Samsung Engineering Co. Ltd., 415-10 Woncheon-Dong, Youngtong-Gu, Suwon, Gyeonggi-Do, 443-823, Korea

²Department of Civil and Environmental Engineering, University of South Carolina, Columbia, SC 29208, USA

³Department of Civil and Environmental System Engineering, Hanyang University, 1271 Sa-1 Dong, Ansan, Gyeonggi-Do, 425-791, Korea

Abstract. The presence of *N*-nitrosodimethylamine (NDMA) in drinking water supplies has raised concern over its removal by common drinking water treatment processes. However, only limited studies have been examined to evaluate the potential removal of NDMA by numerous water treatment technologies within a realistic range (i.e., sub µg/L) of NDMA levels in natural water due to analytical availability. In this study, a simple detection method based on scintillation spectroscopy has been used to quantify the concentration of ¹⁴C-labeled NDMA at various ratios of sample to scintillation liquid. Without sample pretreatment, the method detection limits are 0.91, 0.98, 1.23, and 1.45 ng/L of NDMA at scintillation intensity ratios of 10:10, 5:15, 15:5, and 2.5:17.5 (sample: scintillation liquid), respectively. The scintillation intensity in all cases is linear ($R^2 > 0.99$) and is in the range of 0 to 100 ng/L of NDMA. In addition, because scintillation intensity is independent of solution pH, conductivity, and background electrolyte ion types, a separate calibration curve is unnecessary for NDMA samples at different solution conditions. Bench-scale experiments were performed to simulate individual treatment processes, which include coagulation and adsorption by powdered activated carbon (PAC), as used in a drinking water treatment plant, and biosorption, a technique used in biological treatment of waste water. The results show that coagulation and biosorption may not be appropriate mechanisms to remove NDMA (i.e., hydrophilic based on its low octanol-water partitioning coefficient, $\text{Log } K_{ow} = 0.57$). However, relatively high removal of NDMA (approximately 50%) was obtained by PAC at high PAC dosages and longer contact times.

[Final Revised Paper](#) (PDF, 1848 KB) [Discussion Paper](#) (DWESD)

Citation: Chung, J., Yoon, Y., Kim, M., Lee, S.-B., Kim, H.-J., and Choi, C.-K.: Removal of radio *N*-nitrosodimethylamine (NDMA) from drinking water by coagulation and Powdered Activated Carbon (PAC) adsorption, Drink. Water Eng. Sci., 2, 49-55, doi: 10.5194/dwes-2-49-2009, 2009. [Bibtex](#) [EndNote](#) [Reference Manager](#) [XML](#)

Search DWES

Full Text Search

Title Search

Author Search

News

- News Archive available
- Please Note: Updated Reference Guidelines
- The editorial board welcomes two new editors: Pierre Le-Clech from Australia and Emile Cornelissen from the Netherlands.
- DWES will publish the best papers of the Filtech 2011 conference.

Recent Papers

01 | DWESD, 18 Oct 2010: Groundwater contamination due to lead (Pb) migrating from Richmond municipal landfill into Matsheumhlope aquifer: evaluation of a model using field observations

02 | DWES, 27 Sep 2010: Monitoring water distribution systems: understanding and managing sensor networks

03 | DWESD, 22 Sep 2010: Water supply project feasibilities in fringe areas of Kolkata, India

ARCHIVED IN



PORTICO

