

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](#) [Special Issue](#)

Drink. Water Eng. Sci., 2, 57-62, 2009

www.drink-water-eng-sci.net/2/57/2009/

doi: 10.5194/dwes-2-57-2009

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

Development of a predictive model to determine micropollutant removal using granular activated carbon

D. J. de Ridder¹, M. McConville¹, A. R. D. Verliefde^{1,2,4}, L. T. J. van der Aa^{1,3}, S. G. J. Heijman¹, J. Q. J. C. Verberk¹, L. C. Rietveld^{1,3}, and J. C. van Dijk¹

¹Delft University of Technology, P.O. Box 5048, 2600 GA Delft, The Netherlands

²UNESCO Centre for Membrane Science & Technology, University of New South Wales, NSW 2052, Sydney, Australia

³Waternet, P.O. Box 94370, 1090 GJ, Amsterdam, The Netherlands

⁴KWR Watercycle Research Institute, P.O. Box 1072, 3430BB Nieuwegein, The Netherlands

Abstract. The occurrence of organic micropollutants in drinking water and its sources has opened up a field of study related to monitoring concentration levels in water sources, evaluating their toxicity and estimating their removal in drinking water treatment processes. Because a large number of organic micropollutants is currently present (although in relatively low concentrations) in drinking water sources, a method should be developed to select which micropollutants has to be evaluated with priority. In this paper, a screening model is presented that can predict solute removal by activated carbon, in ultrapure water and in natural water. Solute removal prediction is based on a combination of solute hydrophobicity (expressed as $\log D$, the pH corrected $\log K_{ow}$), solute charge and the carbon dose. Solute molecular weight was also considered as model input parameter, but this solute property appeared to relate insufficiently to solute removal.

Removal of negatively charged solutes by preloaded activated carbon was reduced while the removal of positively charged solutes was increased, compared with freshly regenerated activated carbon. Differences in charged solute removal by freshly regenerated activated carbon were small, indicating that charge interactions are an important mechanism in adsorption onto preloaded carbon. The predicted solute removal was within 20 removal-% deviation of experimentally measured values for most solutes.

[Final Revised Paper](#) (PDF, 111 KB) [Discussion Paper](#) (DWESD)

Citation: de Ridder, D. J., McConville, M., Verliefde, A. R. D., van der Aa, L. T. J., Heijman, S. G. J., Verberk, J. Q. J. C., Rietveld, L. C., and van Dijk, J. C.: Development of a predictive model to determine micropollutant removal using granular activated carbon, Drink. Water Eng. Sci., 2, 57-62, doi:10.5194/dwes-2-57-2009, 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

