Humic acid as a model for natural organic matter (NOM) in the removal of odorants from water by cyclodextrin polyurethanes

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Abstract

Current practices in some water-treatment facilities have reported that natural organic matter (NOM) blocks the adsorption sites of activated carbon resulting in lower geosmin and 2-methylisoborneol (2-MIB) removal. Humic acid has been reported to compete with geosmin and 2-MIB removal in the same way. The removal of odour chemicals such as geosmin and 2-MIB is important for potable-water treatment by water supply companies and municipalities. We have previously demonstrated that cyclodextrin polyurethanes are capable of removing a number of organic pollutants from water, but are not able to reduce the levels of NOM significantly. We wished to determine if the polymers would selectively remove geosmin and 2-MIB, despite the presence of NOM. Humic acid was chosen as a model for NOM since NOM constitutes about 70% of humic acid. Results obtained from this study indicate that the presence of humic acids at different concentrations could not affect the removal of geosmin and 2-MIB when cyclodextrin polymers were used since 90% removal was achieved. However the UV-Vis analysis showed a low removal of humic acids (3 to 20%).

Keywords: cyclodextrin polymers, geosmin, 2-methylisoborneol (2-MIB), humic acids