

Removal of geosmin and 2-methylisorboneol (2-MIB) in water from Zuikerbosch Treatment Plant (Rand Water) using β -cyclodextrin polyurethanes

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Abstract

Geosmin and 2-methylisorboneol (2-MIB) are major organic pollutants responsible for undesirable taste and odour in water. These compounds impact greatly on the aesthetic quality and general consumer acceptability of drinking water. The use of granular activated carbon (GAC) in the removal of geosmin and 2-MIB is generally ineffective since these compounds are present at very low concentrations ($\text{ng}\cdot\text{l}^{-1}$). Water treatment technologies that can remove geosmin and 2-MIB from water below human detection threshold ($<10\text{ ng}\cdot\text{l}^{-1}$) are highly sought by drinking water supplies, e.g. Rand Water. The removal of these odour-causing compounds from water samples using cyclodextrin-based nanoporous polyurethanes was investigated in our laboratory. Geosmin and 2-MIB were extracted from water samples by solid phase micro-extraction (SPME) and analysis was carried out using gas chromatography-mass spectrometry (GC-MS). Results from the analysis demonstrated that these polymers were highly effective in removing geosmin and 2-MIB.

Keywords: geosmin, 2-MIB, cyclodextrin polymers, Rand Water, SPME, GC-MS