



Comparison of nanofiltration and adsorption techniques to remove arsenic from drinking water

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Received 15 September 2008; Accepted 5 November 2008

ABSTRACT

Arsenic occurs naturally in the ground and surface water and is not desired in the drinking water due to carcinogenic effect on human body. The common types of arsenic are arsenate (As V) and arsenite (As III). Although arsenate removal has been achieved by membranes, adsorption, ion exchange and coagulation, arsenite removal is difficult to decrease the concentration up to the standard level (below to 10 µg/L). In this study, nanofiltration (NF) and adsorption techniques have been compared to remove arsenite from drinking water. In nanofiltration study, different NF membranes and arsenite feed concentrations have been studied. Feed water was prepared synthetically and laboratory scale cross-flow mode filtration apparatus with a flat-sheet membrane cell was used for NF experiments. In the adsorption experiments with granular iron hydroxide (GIH), all studies were performed in the free water flow and at the normal pH of tap water. It was concluded that arsenite concentration was lowered to below 10 µg/L with adsorption. These results showed that GIH adsorption can be used to remove arsenite concentration of 0.1 and 0.5 g/L from water supplies.

Keywords: Arsenite removal, Nanofiltration membranes, Granular iron hydroxide, Drinking water

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