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## Effective water disinfection using silver nanoparticle containing silica beads

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### Abstract

The shortage of safe drinking water in developing countries and at the sites of natural disaster has spurred scientists to develop more effective materials for water disinfection at the point of use. In the present study, silver nanoparticle supported silica beads (Ag-NPBs) with sizes ranging from 0.5 to 1 mm were prepared, and their potential for water disinfection was examined. *E. coli* was utilized to assess water disinfection potential by flow tests using a filter column filled with Ag-NPBs. Ag-NPBs inactivated > 99% of *E. coli* with a contact time of several seconds when the input water had a bacterial load of approximately  $10^6$  colony-forming units per mL. Ag-NPBs have an antibacterial capacity of 4.5 L/g. The effect of ammonium and urea on the release rate of silver into filtrate was

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