

# ***Interactive comment on “Surface Water Purification using cellulose Paper Impregnated with Silver Nanoparticles” by Shahad A. Raheem and Alaa H. Alfatlawi***

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Discussion paper



# Surface Water Purification using cellulose Paper Impregnated with Silver Nanoparticles

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**Abstract.** The objective of this study is to prepare a cellulose paper was impregnated with silver nanoparticles (AgNPs) for the purpose of water purification (Disinfection (removal of Escherichia Coli, Staphylococcus Aureus, Enterococcus Faecalis, Enterobacter Aerogenes, Klebsiella Pneumoniae, and Proteus mirabilis) and filtration). AgNPs papers were prepared by chemical reduction of silver nitrate ( $\text{AgNO}_3$ ) with various concentrations (0.005 M, 0.015 M, 0.03 M, and 0.05 M) using sodium borohydride ( $\text{NaBH}_4$ ) as a reducing agent. Two ratios of  $\text{NaBH}_4/\text{AgNO}_3$  of 2:1 and 10:1 were used to show the effect of reduction on the formation and removal efficiencies of AgNPs. AgNPs papers were characterized using Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM). An acid digestion using HCL acid followed by analyzing the samples in Atomic Absorption Spectrometer (ASS) was conducted to measure the silver concentration in AgNPs papers. TEM images showed that the silver nanoparticles size in the papers varies from 1.3 to 75 nm. Water samples, after filtration through AgNPs papers, were analyzed using (ASS) to measure the concentration in the effluent water. AgNPs paper antibacterial efficiency ranged (99 % to 100 %) for both

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Cellulose paper

