

Antibacterial Activity of Silver Deposited Vein Graphite against Waterborne Pathogenic *Escherichia coli*

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The microbial contamination of drinking water is a major health problem in the world which requires an effective treatment. Silver ion (Ag^{+2}) is used as nonspecific antibacterial factor and it acts against a very broad spectrum of bacterial species. In this study, antibacterial efficiency of Ag deposited vein graphite were studied using *Escherichia coli* strain. Ag was deposited on the graphite surface by reduction of Ag^{+2} in silver nitrate solution using reducing agent. Scanning electron microphotographs of the Ag deposited graphite reveal that the deposited silver particles are highly agglomerated or spongy voids. Although the size of silver particle agglomerates are relatively coarse, the average size of individual silver nanoparticle is around 75 nm. Antibacterial efficacy of the synthesized sample was investigated using waterborne pathogenic *E. coli* strain. The antibacterial test was done using prepared composite samples and samples of *E. coli*, using shake flask method. A commercial antibiotic (Ofloxin-200 mg) was used as the positive control. The samples were drawn periodically (1, 1.5, 2, 2.5 and 3 hours) from the flask and tested against *E. coli* by plate count method using standard procedures. There was a significant *E. coli* removal efficiency by the synthesized Ag Graphite composite compared to purified graphite and positive control (One-way ANOVA, p-value=0.00). Therefore, this study suggests that Ag- vein graphite composite could be used as an effective material in water purification, especially in removing of *E. coli*.

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