

# Microwave Synthesis of Nanosilver Colloidal Suspension for Anti-bacterial Coating

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## Abstract

This article reports a microwave-assisted route to synthesize nanosilver colloidal suspension and to deposit silver nanoparticles onto activated carbon fabrics (ACFs). The properties of the nanosilver suspension are characterized in terms of bacterial inactivation and growth inhibition. The metallic Ag nanocrystals with narrow size distribution are uniformly dispersed onto ACFs under the microwave irradiation of 1 min. Microwave irradiation is capable of heating up the reaction solution homogeneously, inducing uniform nucleation and rapid crystal growth to form the Ag crystallites. This work aims to elucidate how as-grown Ag nanoparticles affect the inactivation of *Escherichia coli* (*E. coli*) and how Ag-ACF surface inhibits the bacterial growth. The Ag colloidal suspension offers superior anti-bacterial ability against *E. coli* cells at a low concentration of 20 mg/L. Thus, the study has established a simple, efficient and effective process in the synthesis of both Ag colloidal suspension and Ag-ACF composite.

Keyword : Silver nanoparticles; Microwave heating; Anti-bacterial ability; Activated carbon fabric;