Effects of cationic and anionic micelles on the morphology of biogenic silver nanoparticles, and their catalytic activity for congo red

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Abstract

The effects of cationic and anionic micelles of cetyltrimethylammonium bromide (CTAB) and sodiumdodecyl sulphate (SDS) have been studied on the morphology of biogenic Ag-nanoparticles (Ag-NPs) using an aqueous extract of Mentha leaves extract as a reducing agent for the first time. UV-visible absorption spectra showed one surface Plasmon resonance peak (SPR) at ca. 425 nm, indicating the Ag-NPs formation having almost spherical morphology. Reaction-time profiles suggest that rates (nucleation and growth) of the Ag-NPs were completed within the 30 min of the reaction time. Extract-, CTAB-, and SDS-capped Ag-NPs were characterized by conventional TEM, SEM and EDX techniques. CTAB and SDS have significant impact on the as prepared Ag-NPs. Absorbance continuous decreases, and decreases-increases with these stabilizers, respectively. Resulting Ag-NPs was used as a catalyst to the removal of congo red from industrial wastes water. UV-visible absorption spectra indicate that congo red form stable complex with Ag-NPs. (C) 2016 Elsevier B.V. All rights reserved.

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