

Oral Presentations

Synthesis of sulfur nanoparticles and their antibacterial activities

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Abstract

Different methods were used for Sulfur nanoparticles (S NPs) synthesis; among those, chemical precipitation, electrochemical method, micro emulsion technique, composing of oil, surfactant, co-surfactant, aqueous phases with the specific compositions and ultrasonic treatment of sulfur-cystine solution. In this work S NPs were prepared by a quick precipitation method using sodium thiosulphate and tetraoctylammonium bromide surfactants in conc. hydrochloric acid media [1].

The sizes and shapes of S-NPs were confirmed by scanning electron microscope (SEM), transmission electron microscopy (TEM) and X-ray diffraction (XRD) techniques, Figure1.

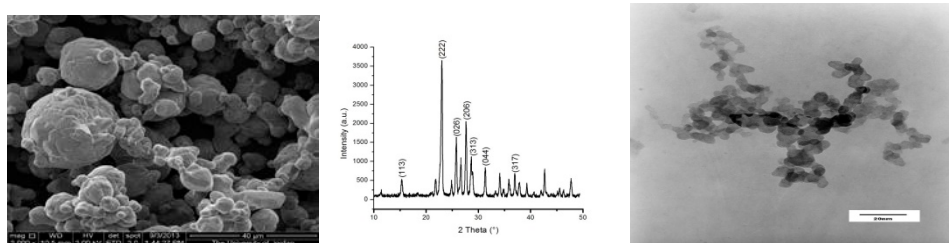


Figure 1. SEM micrographs, XRD pattern, TEM micrographs of S NPs.

Broth micro-dilution method was applied to determine antibacterial activity of S-NPs against *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa* reference strains. S-NPs exhibited antimicrobial activity (MIC = 5.47 µg/mL) against *Staphylococcus aureus* strain (Gram-positive bacterium). On the other hand, no antimicrobial activity was detected against Gram-negative bacteria isolates (*Escherichia coli* and *Pseudomonas aeruginosa*) at 0.68 to 800 µg/mL.

Keywords: Sulfur Nanoparticles (S-NPs), TEM, SEM, XRD, Antimicrobial activities.

References:

[1] M. Suleiman, A. Al Ali, A. Hussein, B. Hammouti, T.Hadda, I.Warad. (2013) Sulfur Nanoparticles: Synthesis, Characterizations and their Applications. *J. Mater. Environ. Sci.*, 4, 1029-1033.