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Size Selective Synthesis of Sulfur Nanoparticles and their Anti Cancer Activity

Anas Al-Ali*, Mohammed Suleiman, Ayman Hussein.

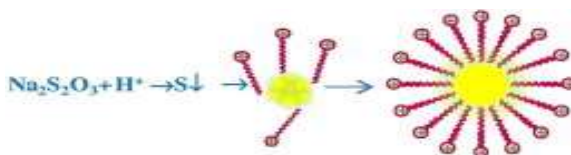
*Department of Chemistry, Science College. An-Najah National University, P. O. Box 7,
Nablus, Palestine.*

*Author to whom correspondence should be addressed; E-Mail: anas.alali@najah.edu;
Tel.: +972599101764.*

Abstract

Sulfur is an important element with many practical applications when present as nanoparticles. Nanosize sulfur particles also have many important applications like in pharmaceuticals, medicine, synthesis of nano-composites for lithium batteries, modification of carbon nano tubes [1]. Different methods were used for nano-sized particle 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 [2]. In this work sulfur nanoparticles (S NPs) were prepared by a quick precipitation method with and without using a surfactant to stabilize the formed S NPs.

The synthesized S NPs were characterized by XRD, SEM and TEM in order to confirm their sizes and structures.



Scheme 1. Synthesis of the stabilized S NPs.

Application of nanotechnology is suggested for diagnosis and treatment of cancer [3]. The anticancer activity of the prepared S NPs has been tested on various types of cancer cell clones including leukemia, kidney and colon cancers.

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The desired S NPs revealed a high promising activity and selectivity toward killing kidney cancer as seen in Figure 1.

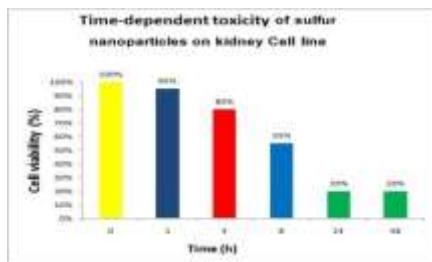


Figure 1. Time-dependent toxicity of (7.3 nm) S NPs in Kidney cells.

Keywords: Sulfur Nanoparticles (S-NPs),

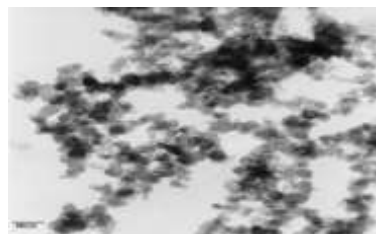
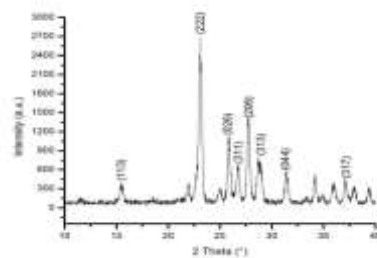
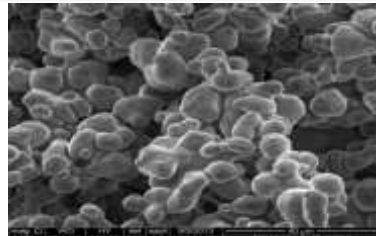


Figure 2. SEM micrographs, XRD pattern, TEM micrographs of S NPs.

References:

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- [3] F.Alexis, E.Pridgen, L.Molnar, O.Farokhzad. (2008) Factors affecting the clearance and biodistribution of polymeric nanoparticles. *Mol. Pharmacol*, 5, 05–15.