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Reversible encapsulation of silver nanoparticles into the helix of amylose (water soluble starch)

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Natural biodegradable polymeric starch capped Ag-nanoparticles (AgNPs) were prepared by using extract of *Dioscorea deltoidea* in the presence of starch. UV-visible spectroscopy, transmission electron microscopy (TEM), X-ray diffraction (XRD), energy dispersive X-ray spectroscopy (EDX), scanning electron microscopy (SEM), Fourier-transform infrared (FT-IR) spectroscopy, and digital images were used to determine the morphology and chemical composition of the as prepared AgNPs. The kinetics and morphology of the nano-materials (spherical, rod, triangular, irregular, truncated triangular, hexahedral, mono-dispersed, and aggregated) were discussed in terms of the extract, Ag⁺ and starch. Iodometric titration was used to confirm the reversible encapsulation of the AgNPs inside the helical structure of amylose. TEM images also suggest that the morphology of the encapsulated AgNPs entirely changes in comparison with the non-encapsulated AgNPs. The starch functionalized AgNPs could be used for drug delivery, with the nucleation and aggregation controlled through fusogenic behaviour.

Biography

Elham Shafik Aazam has completed her PhD from Sussex University, UK and is a Professor at King Abdulaziz University at the Science College and Chemistry department. She is the Head of the Chemistry Department at the female campus. She has published 43 papers in reputed journals.

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