

## Facile synthesis of silver nanoparticles under $\gamma$ -irradiation: effect of chitosan concentration

### ABSTRACT

In the present study, a biopolymer, low molecular weight chitosan had been utilized as a green stabilizing agent for the synthesis of silver nanoparticles under  $\gamma$ -irradiation. The synthesized silver nanoparticles have particle diameters in the range of 5 nm to 30 nm depending on the percentage of chitosan used (0.1 wt%, 0.5 wt%, 1.0 wt% & 2.0 wt%). It was found that the yield of the silver nanoparticles was in accordance with the concentration of chitosan presence in the solution due to the reduction by the chitosan radical during irradiation. The highly stable chitosan encapsulated silver nanoparticles were characterized using transmission electron microscopy (TEM), UV-Visible spectrophotometer (UV-VIS) and X-ray diffraction spectroscopy (XRD).

**Keyword:**  $\gamma$ -irradiation synthesis; Antibacterial; Chitosan; Silver nanoparticles