

Abstract

Biosynthesis of nanoparticles is an exciting area of research with extensive applications due to the prerequisite to starting unique, efficient, and cost-effective synthesis techniques. In this study, Zinc Oxide nanoparticles have been prepared through the green method using Quince seeds hydrogel for application in drug delivery. The synthesized product was characterized by UV-visible spectroscopy, SEM, EDX, and FTIR. The results obtained from characterization showed the uniform crystals of ZnO having spherical shape and size of 70 nm. Moreover, the objective of this study was to investigate nanoparticle-drug conjugate for better control of drug delivery and release. The widely used antibiotic Sulphadimidine Sodium was conjugated with Zinc Oxide nanoparticles and conjugation was confirmed by FTIR. The observed drug loading capacity of Sulphadimidine Sodium was $72 \pm 3.5\%$. While, the release experiment was performed through the dialysis membrane method, and the drug exhibited maximum release of 79.12% and 68.18% in phosphate buffer of pH 6.8 and 7.4, respectively.