

ABSTRACT

The fabrication of nanoparticles with required properties in the medicinal field is very important these days. We demonstrate for the first time, the development of silver Nanoparticles incorporated in Hydrogel from seeds of *Cydonia oblonga* for the medicinal purpose i.e. antimicrobial performance. In this work, silver Nanoparticles are incorporated in Hydrogel from seeds of *Cydonia oblonga*. These quenched intensities were due to energy transfer processes to the metal nanoparticles. Conversely, increase in UV intensities with an increase in the concentration of the nanoparticles which may be useful for the design of new analytical tool for medicinal purpose. The structural properties of prepared nano materials were analyzed by X-Ray diffraction (XRD). Surface morphology of prepared metal Hydrogel nano materials were studied by Scanning Electron Microscopy (SEM).

Spherical morphology of the nanoparticles [magnification: 2 kx, bar: 500nm] with a particle size in the range of 45-80 nm. The characteristic SPR peaks of glucuronoxylan mediated – silver nanoparticles have their UV-visible spectra at 360 to 460 nm for concentration in mmol. The sample had diffraction peak at $2\theta = 38.1^\circ$ AgNO_3 which were attributed to (111) based on face-centered cubic structures of silver. In photoluminescence the emission wavelength of Ag was red shifted as loading content of smaller luminescent silver nanoparticles increased from 492 to 527 nm. While FT-IR spectra showed that C–O–C stretching (1047cm) of GX was shifted to a large band (1109 cm⁻¹) for Ag NPs. Appearance of a new band at 464.8–592 cm⁻¹ due to Ag–O van der Waals forces confirms the formation of Ag NPs.

The as synthesized Ag NPs tested against *Escherichia coli* and bacillus *licheniformes* inhibited the growth of bacteria. The zones of inhibition against *E.coli* are 4.1mm, 5.2mm and 4.6mm and for *b.licheniformes* are 2.3mm, 2.0mm, 2.7mm as compared to positive and negative control respectively. We have found the cost-effective, easy to use and affordable method to design

Anti-microbial

product.