**Abstract**

[Metallic nanoparticles](https://www.sciencedirect.com/topics/engineering/metallic-nanoparticles) are traditionally synthesized by wet chemical techniques, in which the chemicals used are quite often toxic and flammable. Ripe carica papaya peel is found to be a suitable source for green synthesis of [silver nanoparticles](https://www.sciencedirect.com/topics/engineering/silver-nanoparticles). In the present work, a cost effective and environmental friendly technique for the green synthesis of silver nanoparticles from 1 mM [silver nitrate](https://www.sciencedirect.com/topics/engineering/silver-nitrate) (AgNO3) solution through the extract of ripe Carica papaya peel of various concentrations (5 ml, 10 ml, 15 ml, 20 ml, 25 ml) is described. The synthesized silver nanoparticles are characterized by using the UV–vis absorption spectroscopy, FT-IR, XRD, SEM and TEM. The formation of silver nanoparticles is confirmed by [surface plasmon](https://www.sciencedirect.com/topics/engineering/surface-plasmon) resonance, determined by UV–vis spectra at 400–435 nm. The shift in the absorption bands and variation in the calculated optical band gaps for the various concentrations of papaya peels extracts are also observed. The FT-IR spectra reveal that an increase in the concentration of the papaya peel extract shifts the bands to higher wavelengths. The average [crystallite size](https://www.sciencedirect.com/topics/engineering/crystallite-size) for various concentrations of papaya peel extract is observed from XRD spectral analysis and is found to be around 16–20 nm, which is in good agreement with the TEM analysis. The SEM analysis shows the spherical structure of the silver nanoparticles with some agglomeration for higher concentrations of papaya peel extract. The synthesized silver nanoparticles show good antibacterial activity against human [pathogens](https://www.sciencedirect.com/topics/engineering/pathogens) such as Escherichia coli and Staphylococcus aureus and it has many medical applications.