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## An Environmentally benign Synthesis and Characterization of Novel Sugar based Silver Nanocomposite Hydrogel for Antibacterial Applications

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**Abstract**:The incorporation of nanometals into hydrogels have been extensively studied and found to haveimmense potential for medical, therapeutic and diagnostic applications. In the present investigation, we report an environmentally benign synthesis of sugar based semi interpenetrating hydrogel (SIH) networks of cross-linked poly(acrylamide) utilizing carboxymethylcellulose (CMC) – starch (SR) biocomposites as a grafting backbone and N,N'- methylenebisacrylamide (MBA) as the cross-linker. Invariably sized silver nanoparticles were generated insitu in the swollen hydrogel by the reduction of silver nitrate (AgNO<sub>3</sub>) using azadirachtaindica (neem) leaf extract at room temperature. UV-Visible spectroscopy, FTIR spectroscopy, scanning electron microscopy (SEM) and thermogravimetric analysis (TGA) were used to characterize the formation of silver nanoparticles in the hydrogel. The antibacterial activity of the semi interpenetrating silver nanocomposite hydrogel was also investigated.

**Keywords:** Silver nanoparticles, environmentally benign synthesis, acrylamide, carboxymethyl cellulose, starch, hydrogel, nanocomposites.

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