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Synthesis and characterization of gold nanocomposite loaded hydrogels and their antibacterial applications

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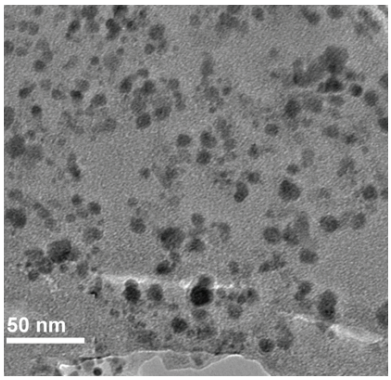
Sodium carboxymethyl cellulose and Polyvinyl alcohol/ acrylic acid (CMC/PVA/AA) semi-interpenetrating polymer network (semi-IPN) hydrogels were prepared by free radical polymerization technique. Gold nanoparticles were formed by reduction of AuCl4 in semi-IPN hydrogels with trisodium citarate under microwave radiation. UV-visible spectroscopy, thermogravimetrical analysis, X-ray diffractometry, scanning electron microscopy, and transmission electron microscopy techniques were used to characterize the formation of gold nanoparticles in hydrogels. SEM images indicated clearly the formation of group of gold nanoparticles with size range of 10-12 nm. The sizes of gold nanoparticles were also supported by transmission electron microscopy results. The semi-IPN gold nanocomposite hydrogels reported here might be a potentially smart material in range of applications of antibacterial activity.



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