ABSTRACT

Green synthesis of inorganic nanoparticles (NPs) is favorably carried out by employing polysaccharides, benefitting from their cheap and environmentally friendly nature. Herein, we are reporting microwave assisted green synthesis of Ag NPs from linseed hydrogel (LSH) by mixing 10.0 mL suspensions of hydrogel and $AgNO_3$, respectively in deionized water. Overall reaction progress was examined by change in color and UV-Vis spectra after every 30 sec. Successful reduction of Ag^+ to Ag^0 was established by surface plasmon resonance absorption of Ag NPs at continuous time breaks, i.e., 30, 60, 90, 120, 150, 180, 210 and 240 seconds, respectively at a wavelength range of 200-800 nm by UV-Vis spectrophotometer. A sharp peak at 464.8-592 cm^{-1} in FTIR spectra due to the interaction of Ag with hydroxyl groups of the hydrogel confirmed the successful synthesis of Ag NPs. Scanning electron microscopy (SEM) provided morphological study of Ag NPs as irregular shaped particles having size of 48.7-60.6 nm. Robust antimicrobial activity of Ag NPs was observed as they inhibited the growth of different bacterial and fungal stains. Moreover, the as synthesized Ag NPs possessed a significant antioxidant potential and exhibited 98% DPPH- free radicals scavenging yield at concentration of 15 mM after 2.0 h.