ABSTRACT

The nanoparticles of Barium Sulfate ($BaSO_4$), Calcium Sulfate ($CaSO_4$) and Strontium Sulfate ($SrSO_4$) were synthesized by precipitation method. $BaCl_2$, $CaCl_2$ and $SrCl_2$ were used as raw materials against the $(NH_4)_2SO_4$ as precipitating agent for the synthesis of nanoparticles. Two solvent systems i.e water-ethanol mixed solvent system and pure water solvent system were utilized for the synthesis. All three samples of nanoparticles were heated at two different temperatures, first at 100°C and then at 150°C for the removal of solvents. Then, samples were characterized by Fourier Transform Infrared Spectrophotometer and X-ray diffractometer. The average particle size of nanoparticles was calculated using Scherrer's formula and calculations indicate that the average particle size of $BaSO_4$ particles in ethanol-water and pure-water system was 2 5.26nm and 22.13nm respectively. The average particle size of calcium sulfate was 19.29 and 29.35nm respectively in ethanol-water system and pure-water system. In case of strontium sulfate, the average size was 26.93nm and 27.93nm respectively. The nanoparticles synthesizes in ethanol-water system were further utilized for the synthesis of polyvinyl acetate nanocomposites films with 1-3 wt/wt% composition. The absorption property of pure PVAc film and PVAc nanocomosite films were studied with the help of UV/Visible spectrophotometer.