

ABSTRACT

Size-tunable nanoparticles (NPs) for pristine and various concentrations (5,10 and 15) % of iron (Fe) doped cadmium sulfide (CdS) were synthesized using facile chemical co-precipitation route. To control size of prepared NPs thioglycolic acid was pursued as a capping agent. To investigate structural, optical, morphological, and physiochemical properties, prepared products were characterized by XRD, UV-Vis spectroscopy, FESEM and FTIR. XRD revealed single cubic phase of CdS and confirmed the gradual increase in broadening of peaks upon mixing Fe. The intensive absorption was recorded in visible regime upon doping and introduced red shift. The surface morphologies of Fe: CdS have agglomeration of nano-constituents using FESEM. The presence of Cd-S linkage and corresponding functional groups were recognized by FTIR. $Cd_{1-x}Fe_xS$ ($x=0,0.05,0.10$ and 0.15) powder samples were used as a photocatalyst for degradation of methylene blue (MB) under visible light. It was observed that the controlled sample bleach MB faster than the doped samples.