Abstract

Co-precipitation procedure was employed to prepare efficient ternary system-based catalysts composed of various concentrations (2 and 4 wt.%) of graphitic carbon nitride (g-C_3N_4) and fixed amount (3 wt.%) of eudragit (Eud)-doped cadmium telluride (CdTe) nanostructures (NSs). The main objective of this study was to explore and enhance the dye degradation potential by changing the recombination rate of CdTe with doping and improving their multifunctional efficacy as catalysts and antibacterial agents. The dopants have altered the particle size, dispersal and optical properties of CdTe. The different concentrations of g-C_3N_4 and fixed amount of Eud, reaction temperature, and duration influence these characteristic properties of CdTe. g-C_3N_4/Eud-doped CdTe with porous structure showed excellent methyl orange (MO) dye degradation efficiency (98.0 %) in neutral medium. Furthermore, 4 wt.% of g-C_3N_4 doped NSs exhibited significant inhibition zone as 9.35 ± 0.08 mm against MDR *S. aureus* bacteria.