ABSTRACT

The present work demonstrates the systematic incorporation of different concentrations of graphene oxide (GO) into a fixed amount of polyacrylic acid (PAA) doped SnO_2 quantum dots (QDs) through a co-precipitation approach. The research aimed to evaluate the catalytic and antibacterial action of GO/PAA-SnO_2 QDs. Moreover, optical properties, surface morphology, crystal structure, elemental composition and d-spacing of prepared QDs were examined. XRD patterns revealed the tetragonal configuration of SnO_2, and the crystallinity of QDs was suppressed upon dopants verified by the SAED patterns. Electronic spectra identified the blue shift by incorporating GO, and PAA led to a reduction in band gap energy. FTIR spectra showed the existence of rotational and vibrational modes associated with the functional groups during the synthesis process. A drastic increase in the catalytic efficacy of QDs was observed in the neutral medium by including dopants, indicating that GO/PAA-SnO_2 is the promising catalyst. GO/PAA-SnO_2 showed strong bactericidal efficacy against *Escherichia coli (E.coli)* at higher GO concentrations.