**ABSTRACT**

 In this work, the solid-phase photocatalytic degradation of polystyrene (PS) and polystyrene-ZnO nanocomposite were investigated under the ambient air in order to assess the feasibility of developing photodegradable polymers. PS-ZnO nanocomposites were prepared by using PS solution in which 5% percentage of ZnO nanoparticles were dispersed by constant stirring. The prepared nanocomposites such as PS, PS-5%ZnO were exposed to UV irradiation for various time intervals i.e. 30, 60, 90 and 120 h. On increasing irradiation time, increase in degradation efficiency was observed. Moreover, the effect of UV radiation on its structural, optical and degradation properties of various PS-ZnO nanocomposite has been studied. Further, SEM analysis reveals the morphological nature of the nanocomposites and confirms the degradation of nanocomposites. Results shows that an increase in ZnO concentration with Polystyrene enhances the photo-catalytic degradation of PS-ZnO nanocomposite. Hence the influence of Nano Zinc oxide particles and its efficient contribution in degradation of polymer was confirmed.