

Preparation of titanium dioxide photocatalyst loaded onto activated carbon support using chemical vapor deposition: a review paper

Abstract

Waste tires, which are an abundant waste product of the automobile industry, were used to prepare activated carbon by means of physical and chemical activation. A two-stage process was used, with a semi-carbonization stage as the first stage, followed by an activation stage as the second stage. All experiments were conducted in a laboratory-scale muffle furnace under static conditions in a self-generated atmosphere. During this process, the effects of the parametric variables of semi-carbonization time (for the physical activation process), activation time and temperature and impregnation ratios (for the chemical activation process) on the percentage yield were studied and compared. Varying these parametric variables yielded interesting results, which in turn affected the adsorption process of 2,4-DCP, which was the simulated pollutant in aqueous form. The optimized percentage yields of activated carbon that were obtained were 41.55% and 44.88% of the physical and chemical activation treatment processes respectively.