

过程与工艺

Interactive Oxidation of Photocatalysis and Electrocatalysis for Degradation of Phenol in a Photoreactor

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摘要 TiO₂/C particles as photocatalyst were prepared by dipping TiO₂ suspension solution with activated carbon and were applied in the photocatalytic-electrocatalytic degradation of phenol, the Ti/SnO₂+Sb₂O₃/PbO₂ electrode and oxygen diffusion electrode were used as anode and cathode respectively, and a 250 W ultraviolet lamp (365 nm) as side light source. The SEM results of TiO₂/C and Ti/SnO₂+Sb₂O₃/PbO₂ anode indicated that the TiO₂ on carbon particles was uniform and PbO₂ film on the surface of anode was in cauliflower form, the XRD result of oxygen diffusion electrode showed that only crystalline graphite was found. The influential parameters of degradation process such as applied cell voltage (E), initial concentration of phenol (C₀), amount of TiO₂ catalyst and air flow rate (v) were discussed. Under the following experimental conditions of C₀=50 mg/L, pH=6, E=2 V, TiO₂ 0.98 mg/mL, v=382.2 mL/min, and light intensity I=10.5 mW/cm², phenol could be entirely degraded, and about 89% of total organic carbon (TOC) was removed after 3 h degradation.

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