Synthesis and characterization of titania nanotube-carbon nanotube composite for degradation of phenol

Desi Heltina, author

Abstrak

Titania nanotube (TNT)-carbon nanotube (CNT) composite had been successfully synthesized using simple mixing under acidic conditions and ultrasonic treatment. The samples were further characterized via field emission scanning electron microscopy (FESEM), X–ray diffraction (XRD), diffuse re?ectance UV-vis spectroscopy, and Brunauer-Emmett-Teller (BET) analysis. The TNT–CNT composite's ability to degrade phenol, a model of industrial waste, was tested. The effects of CNT composition and calcination temperature on the phenol degradation performance of TNT-CNT composite were investigated. The results show that the TNT-CNT composite exhibits higher photocatalytic activity than TNT or CNT alone. The crystallinity of the catalyst is not the only parameter affecting the photocatalytic activity. Rather, the specific surface area, bandgap, and morphology of the catalyst must also be considered.