Research on the Photocatalytic Activity of Activated Carbon Fiber Coated with TiO_2 nanoparticles

Pei Liu, Peng Miao, Yongzhen An,* Jie Liu, Xiaoxu Wang

Key Laboratory of Carbon Fiber and Functional Polymers, Ministry of Education, Beijing University of Chemical Technology, Chao-Yang District, Beijing 100029, China

At present, TiO_2 is considered to be promising photocatalysts with good market application prospects in pollution control due to its high efficiency, non-toxicity and low cost. While PAN-based activated carbon fiber (ACF) owns its natural advantages of effectively absorbing organic pollution, especially those contains N or S element, such as methylene blue and hydrogen cyanide. Moreover, PAN-based ACF can also be an efficient absorbent for VOCs, which is a challenging issues in nowadays society. In this study, the treated nano-TiO_2 wascoated onto the surface of the PAN-based activated carbon fiber using a spray coating method. The VOCs is catalytically degraded in a confined space using the obtained composite material. The result indicate that a high photocatalytic degradation rate (over 90 % in 2 hours) was achieved.

Key words: TiO_2 PAN-based ACF Photocatalysis VOCs