

Photodegradation of volatile organic compound (VOC) through pure TiO₂ and V-Doped TiO₂ coated glass fibers

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Most volatile organic compounds (VOCs) are very harmful to human health as well as the environment. Photocatalytic degradation technique is considered as effective method to decompose them. Research on this technique has been made by metal-doping for enhancement of the photocatalytic properties of pure TiO₂. In this study, vanadium is selected for doping metal because its ionic radius is almost the same as titanium ion and can be easily doped into TiO₂. V-doped TiO₂ was synthesized by sol-gel method and characterized by UV-visible spectrophotometer for the band gap change. Synthesized powders were attached to glass fiber through chemical bonding by cross-linking method. Degradation abilities of metal doped TiO₂ were evaluated through degrading p-xylene in the VOC removal test. VOC concentration degradation test was performed under UV light sources in an enclosed chamber. Photocatalytic activities of V-doped TiO₂ attached sample were evaluated based on the experimental results and compared with the sample of pure TiO₂.