

泡沫镍负载TiO₂和TiO₂/Al₂O₃薄膜的光催化性能研究

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摘要 以泡沫镍为载体, Al₂O₃ 作为过渡中间层, 用溶胶-凝胶法在泡沫镍上负载锐钛矿相的TiO₂薄膜, 制成泡沫金属基的TiO₂和TiO₂/Al₂O₃光催化剂, 利用XRD和FE-SEM等测试手段对其性质进行表征, 用乙醛气体的光催化降解测试其活性. 研究表明: 泡沫镍负载的TiO₂和TiO₂/Al₂O₃薄膜具有良好的光催化活性, 特别是TiO₂/Al₂O₃薄膜具有更高的催化活性. 这是由于负载的Al₂O₃ 过渡中间层增大了载体的比表面积, 具有吸附浓缩作用, 同时也增加了负载光催化剂的活性位数量. 实验表明: TiO₂/Al₂O₃ 薄膜的光催化活性和稳定性较单一的TiO₂薄膜有非常显著的提高.

关键词 [光催化](#) [泡沫镍](#) [TiO₂/Al₂O₃薄膜](#) [乙醛降解](#)

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Photocatalytic Activities of TiO₂ and TiO₂/Al₂O₃ Films Coated on Foam Nickel Substrates

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Abstract Anatase TiO₂ and TiO₂/Al₂O₃ films were successfully prepared on foam nickel substrates by sol-gel technique. The characteristics and photocatalytic activities of the TiO₂ and TiO₂/Al₂O₃ films were investigated by XRD, FE-SEM, etc and by photocatalytic degradation reactions of gaseous acetaldehyde under ultraviolet light irradiation, respectively. The TiO₂ and TiO₂/Al₂O₃ films coated on foam nickel substrates display a high photocatalytic activity for the degradation of acetaldehyde. Compared with the onefold TiO₂ films coated on foam nickel, the TiO₂/Al₂O₃ films show much higher photocatalytic activities. It is confirmed that photocatalytic activities and stabilities are enhanced by coating Al₂O₃ as transition layer on foam nickel, which increase the specific surface areas of substrate surface and absorption property, resulting in increase in the photocatalytic activity.

Key words [photocatalysis](#) [foam nickel](#) [TiO₂/Al₂O₃ films](#) [acetaldehyde degradation](#)

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