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低含量Pr³⁺掺杂WO₃的制备及其光催化分解水析氧活性

杜俊平, 李 洁, 陈启元

(中南大学 化学化工学院, 长沙 410083)

摘 要: 采用低温固相反应法制备低含量Pr³⁺ (0.05%, 质量分数) 掺杂的WO₃催化材料, 采用XRD、XPS和DRS对样品进行表征和分析, 考察催化剂在电子接受体Fe³⁺溶液体系下的光催化分解水制氧活性。结果表明, 0.05% Pr³⁺掺杂可以使WO₃样品的光谱响应范围向可见光区拓展。XPS分析表明, Pr³⁺掺杂可以导致催化剂样品表面氧缺位增加。在可见光辐射下光催化分解水制氧的实验中, 0.05% Pr³⁺掺杂WO₃样品的光催化析氧速率高达196.64 μmol/(L·h), 是未掺杂WO₃的2倍

关键字: 镨; 三氧化钨; 光催化; 分解水

Preparation and photocatalytic activity for O₂ evolution of low content Pr³⁺ doped WO₃

DU Jun-ping, LI Jie, CHEN Qi-yuan

(College of Chemistry and Chemical Engineering, Central South University, Changsha 410083, China)

Abstract: Low content Pr³⁺ (0.05%, mass fraction) doped WO₃ samples were prepared by solid state reaction at low temperature and characterized by XRD, XPS and DRS. The photocatalytic activity for oxygen evolution was investigated. The results show that 0.05% Pr³⁺ dopant can make the optic response range of WO₃ catalysts expand to the visual light obviously. The analytical results of XPS indicate that Pr³⁺-doping can result in the increase of the density of surface oxygen vacancies of catalysts. In the experiment of water splitting to oxygen at the visible radiation, the rate for oxygen evolution of 0.05% Pr³⁺ doped WO₃ is up to 196.64 μmol/(L·h), which is two times of that of pure WO₃

Key words: praseodymium; tungsten trioxide; photocatalytic; water splitting

地 址：湖南省长沙市岳麓山中南大学内 邮编： 410083

电 话： 0731-8876765, 8877197, 8830410 传真： 0731-8877197

电子邮箱： f-ysxb@mail.csu.edu.cn