Short Communication

One-Step Synthesis of Anatase Nanocrystalline TiO₂ at a Low Temperature for High Photocatalytic Performance

Wei Chao^{1,2}, Ying Pengzhan^{3,*}, Qiang Yinghuai^{3,*}, Xia Qingrui³, Gu Xiuquan³

¹ School of Chemical Engineering, China University of Mining and Technology, No1, Daxue Road, Xuzhou, 221116, China

² College of Xuhai, China University of Mining and Technology, No1, Jinshan Road, Xuzhou, 221008, China

³ School of Materials Science and Engineering, China University of Mining and Technology, No1, Daxue Road, Xuzhou, 221116, China

*E-mail: weichaoxh@163.com

doi: 10.20964/2019.08.92

Received: 5 April 2019 / Accepted: 11 June 2019 / Published: 30 June 2019

In this study, the titanium dioxide is prepared at 353 K in one hour using a one-step method. The titanium dioxide prepared using this method consists of anatase clusters with sizes of approximately 5 nm. We find that it has a specific surface area of 504 m²/g, the average pore diameter of a stacking hole was 71 Å, and the band gaps were approximately 3.25 eV. The photocatalytic activity and stability of the titanium dioxide prepared using this method on methyl orange and rhodamine B was as good as that of P25. This method may have a grander prospect for the industrial production of the photocatalyst due to its property of convenience and energy-saving.

Keywords: one-step; anatase titanium dioxide; low temperature; nanocrystalline materials

[FULL TEXT](#)

© 2019 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).