

研究简报

WC/纳米碳管复合材料制备及其电化学性能

马淳安<sup>\*,1,2,3</sup>, 汤俊艳<sup>1,3</sup>, 李国华<sup>1,2,3</sup>, 盛江峰<sup>1,3</sup>

(<sup>1</sup>浙江工业大学绿色化学合成技术国家重点实验室培育基地 杭州 310032)

(<sup>2</sup>浙江工业大学纳米科学与技术工程研究中心 杭州 310032)

(<sup>3</sup>浙江工业大学化学工程与材料学院 杭州 310032)

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摘要 碳化钨具有类铂催化性能和较强的抗中毒能力,但其催化活性远低于铂等贵金属催化剂.

如何提高其催化活性是碳化钨应用研究所面临的主要难点与热点之一.为寻找改善碳化钨催化性能的技术方法,

本文将表面修饰与原位还原碳化技术相结合,成功制备了碳化钨/纳米碳管复合材料,采用XRD,

HRTEM等手段对其形貌和晶相组成进行了表征,并应用粉末微电极对其电催化性能进行了评价.实验结果表明,

样品由碳化钨颗粒和纳米碳管组成,碳化钨为形态不规则纳米颗粒,均匀地生长于纳米碳管的外表面;

在碱性溶液中,复合材料对对硝基苯酚的电催化性能明显强于具有介孔结构的纯碳化钨样品.

这说明将碳化钨复合到纳米碳管的外表面是提高碳化钨电催化活性的有效技术方法之一.

关键词 [碳化钨](#) [纳米碳管](#) [复合材料](#) [制备](#) [电化学性能](#)

分类号

Preparation and Electro-property of Tungsten Carbide/Carbon Nanotube Composite

MA Chun-An<sup>\*,1,2,3</sup>, TANG Jun-Yan<sup>1,3</sup>, LI Guo-Hua<sup>1,2,3</sup>, SHENG Jiang-Feng<sup>1,3</sup>

(<sup>1</sup> State Key Laboratory Breeding Base of Green Chemistry-Synthesis Technology, Zhejiang University of Technology, Hangzhou 310014, China)

(<sup>2</sup> Research Center of Nano Science & Technology, Zhejiang University of Technology, Hangzhou 310014, China)

(<sup>3</sup> School of Chemical Engineering & Materials Science, Zhejiang University of Technology, Hangzhou 310014, China)

**Abstract** Tungsten carbide bears an analogy of the catalytic capability of noble metal Pt, and higher ability to resist very strong catalytic poisons, but its catalytic activity is much lower than that of noble metal. How to improve its catalytic activity is one of the difficult points and the hot topics in recent years. In order to find an approach to solve this problem, tungsten carbide/carbon nanotube composite was prepared through combination of surface decoration with *in situ* reduction and carbonization. The morphology and the crystal phase of the samples were characterized by XRD and HRTEM, respectively. Its electrocatalytic activity was tested by powder-microelectrode in basic solution. The experimental results show that the sample is composed of tungsten carbide and carbon nanotube, and tungsten carbide is nanoscale irregular granule and grows on the surface of carbon nanotube homogeneously. The electrocatalytic activity of the composite for *p*-nitrophenol reduction is higher than that of granular tungsten carbide and tungsten carbide with mesoporous in basic solution. These results indicate that tungsten carbide decorating on the surface of carbon nanotube is one of the effective ways to improve its electrocatalytic activity.

**Key words** [tungsten carbide](#) [carbon nanotube](#) [composite](#) [preparation](#) [electro-property](#)

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通讯作者 马淳安 [nanozjut@zjut.edu.cn](mailto:nanozjut@zjut.edu.cn)

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