

研究报告

基于Pt/C/FN疏水催化剂的常温氢氧复合反应

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摘要 用高压微波加热法制备了 $w(\text{Pt})=10\%$ 的Pt/C催化剂, 得到Pt的粒径 $d=(2.1\pm 0.7)$ nm, 再将Pt/C催化剂与聚四氟乙烯(PTFE)一起负载于泡沫镍(FN), 制备疏水催化剂Pt/C/FN。用Pt/C/FN催化常温氢氧复合反应, 研究了温度和 H_2 流速对 H_2 转化率的影响。与商用亲水催化剂Pt/ Al_2O_3 相比, Pt/C/FN催化剂活性明显更高。潮湿及干燥条件下测试了Pt/C/FN疏水催化剂的活性, 潮湿条件下其活性仅有少量下降。富氧条件下考察了CO对Pt/C/FN疏水催化剂活性的影响, CO对 H_2 转化率的影响较小。

关键词 [氢氧复合](#); [疏水催化剂](#); [Pt/C/FN](#); [常温](#)

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Recombination of H_2 and O_2 Catalyzed by Hydrophobic Pt/C/FN Catalyst at Ambient Temperature

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Abstract

Pt/C ($w(\text{Pt})=10\%$) catalyst was prepared by microwave heating method at high pressure, and the average size of Pt particles was (2.1 ± 0.7) nm. Then polytetrafluoroethylene (PTFE) and the Pt/C catalyst were supported on foamed nickel (FN) to obtain hydrophobic Pt/C/FN catalyst.

The effects of reaction temperature and H_2 flow rate on the catalytic activity of the Pt/C/FN catalyst were determined for the recombination reaction

of H_2O_2 at ambient temperature. The catalytic activity of the hydrophobic Pt/C/FN catalyst is found to be remarkably higher than that of the

commercial hydrophilic Pt/ Al_2O_3 catalyst. Its catalytic activity decreases little under moist environment, compared with dried condition. The influence

of CO on its catalytic activity was examined under excess O_2 . The H_2 conversion is influenced by CO slightly.

Key words [recombination](#) [of](#) [\$\text{H}_2\$](#) [and](#) [\$\text{O}_2\$](#) [hydrophobic](#) [catalyst](#) [Pt/C/FN](#) [a](#) [mbient](#) [temperature](#)

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