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研究论文

活化温度对 CuBTC 催化 CO 氧化反应性能的影响

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- 摘要
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摘要 考察了金属有机骨架材料 CuBTC (BTC 为均苯三酸) 催化 CO 氧化的反应性能, 发现 CuBTC 对 CO 氧化反应表现出良好的催化活性, 且 CuBTC 样品的活化温度对其催化活性的影响很大. 原位漫反射红外光谱、粉末 X 射线衍射、扫描电镜、热重分析和差示扫描量热结果表明, CO 在 CuBTC 骨架中不饱和金属位点上的配位是加速 CO 氧化的主要原因, 且这种不饱和金属位点越多, 其催化活性越高.

关键词: 金属有机骨架材料 铜均苯三酸 一氧化碳 活化条件 气固催化

Abstract: CuBTC (BTC = benzene-1,3,5-tricarboxylate), an metal-organic framework (MOF), is active for CO oxidation. The activation temperature has a significant effect on its activity. In-situ diffuse reflectance Fourier transform infrared spectroscopy, powder X-ray diffraction, scanning electron microscopy, and thermogravimetric analysis and differential scanning calorimetry (TGA/DSC) characterization showed that the coordination of CO on the open metal sites occurred during the oxidation reaction, and more open metal sites in the CuBTC framework gave a higher activity.

Keywords: metal-organic framework, copper benzene-1,3,5-tricarboxylate, carbon monoxide, activation condition, gas-solid catalysis

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