

研究简报

草酸盐固相化学法制备高性能Cu/ZnO甲醇水蒸气重整催化剂

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收稿日期 2006-5-21 修回日期 2006-7-4 网络版发布日期 2007-1-12 接受日期 2006-9-27

摘要 采用草酸盐前驱物固相化学法制备了用于甲醇水蒸气重整制氢反应的Cu/ZnO催化剂, 并与传统液相共沉淀方法制备的Cu/ZnO催化剂在相同条件下的催化性能进行了比较. 结果表明, 通过该“干法”合成的Cu/ZnO催化剂具有比传统液相共沉淀法所制备的催化剂更高的催化活性和制氢选择性, 以及更好的稳定性.

N₂O吸附和原位XRD分析结果证实固相反应时间对Cu/ZnO催化剂的金属铜表面及晶格微应力等微结构性质可产生重要的调控作用, 从而大大改善其催化活性和制氢选择性.

关键词 [甲醇水蒸气重整](#) [Cu/ZnO催化剂](#) [固相化学法](#) [草酸盐](#) [晶格微应力](#)

分类号

Highly Effective Methanol Steam Reforming Cu/ZnO Catalyst Pre-prepared by a Dry Mechanochemical Approach Based on Oxalate Pre-cursor Synthesis

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Abstract It was demonstrated for the first time that highly active Cu/ZnO catalysts for hydrogen production from steam reforming of methanol could be obtained by a dry mechanochemical approach based on oxalate precursor synthesis. Highly strained copper nanocrystals combined with a higher metallic copper surface area achievable account for the higher performance of the mechanochemically derived catalysts compared with their conventional counterparts prepared by coprecipitation method. It was proposed that the beneficial isomorphous substitution between cupric and zinc oxalate precursors could be significantly enhanced by increasing the milling time during the mechanochemical synthesis, which results in enhanced interaction between copper and zinc oxide, thus leading to superior catalytic performance in methanol steam reforming.

Key words [steam reforming of methanol](#) [Cu/ZnO catalyst](#) [mechanochemical method](#) [oxalate](#) [lattice microstrain](#)

DOI:

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