

研究简报

高效甲醇水蒸气重整制氢的SBA-15改性的Cu/ZnO/Al₂O₃催化剂

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摘要 以介孔SBA-15为结构助剂, 制备出用于甲醇水蒸气重整制氢的新型高效氧化硅掺杂的Cu/ZnO/Al₂O₃催化剂, 并与传统Cu/ZnO/Al₂O₃催化剂在相同条件下的催化性能进行了比较. 结果表明, 添加适量介孔SBA-15可显著提高催化剂的催化活性和选择性, 在大幅度提高甲醇转化率的同时有效降低了重整产气中CO的含量. 原位XRD分析证实适量介孔SBA-15的添加对传统Cu/ZnO/Al₂O₃催化剂的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](#) [介孔SBA-15](#) [Cu/ZnO/Al₂O₃催化剂](#) [微观应变](#) [原位XRD](#)

分类号

Highly Effective Hydrogen Production from Steam Reforming of Methanol over SBA-15-modified Cu/ZnO/Al₂O₃ Catalysts

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Abstract Siliceous mesoporous SBA-15 has been proposed as a new effective structural promoter to prepare highly effective SiO₂-modified Cu/ZnO/Al₂O₃ catalysts for hydrogen production. It was demonstrated that the SBA-15 modified catalyst exhibited superior performance in terms of methanol conversion and suppressed formation of CO during steam reforming of methanol. It was suggested that the intrinsic nature of SBA-15 should favor the generation of modified catalyst with much larger metallic copper surface area and improve copper dispersion. In addition, it was shown by *in situ* XRD that a considerable increase of the microstrain of Cu nanocrystals could be achieved in the catalysts modified by SBA-15, which correlates well with the enhanced CH₃OH conversion as observed on the corresponding samples.

Key words [steam reforming of methanol](#) [mesoporous SBA-15](#) [Cu/ZnO/Al₂O₃ catalyst](#) [microstrain](#) [in situ XRD](#)

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