

离子液体导向二氧化硅负载炭改性纳米钌催化剂的制备及其在催化硝基苯加氢反应中的择形性研究

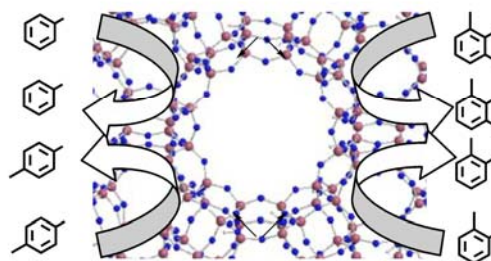
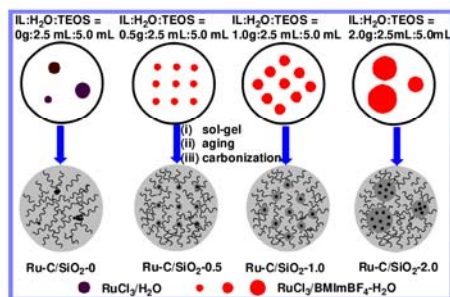
崔新江, 袁航空, 石峰*, 邓友全

中国科学院兰州化学物理研究所, 绿色化学与催化中心, 兰州, 730000

Email: fshi@licp.cas.cn

关键词: 硝基苯, 催化加氢, 纳米, 择形性, 离子液体

硝基苯类化合物的催化加氢是催化化学和化学化工领域的重要反应, 如果能够实现针对不同功能基团的选择性加氢和对不同结构硝基苯的选择加氢无疑将是非常有意义的^{1,2}。在这里, 我们使用离子液体作为模板制备了一系列氧化硅负载炭改性的纳米钌催化剂。在催化剂制备中, 离子液体是三氯化钌的溶剂, 纳米钌改性的炭源同时又是获得合适二氧化硅结构的模板剂(图一)。经过系统的TEM、XPS、XRD和BET等表征和性能研究, 我们发现使用1-丁基-3-甲基咪唑四氟硼酸盐离子液体时可以获得最佳的结构和性能(图二)。



图一、离子液体导向Ru-C/SiO₂催化剂的制备

图二、Ru-C/SiO₂催化硝基苯加氢择形性性能研究

参考文献

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Ionic liquid templated preparation of Ru-C/SiO₂ and its catalytic activity in shape-selective hydrogenation of nitrobenzenes

Xinjiang Cui, Hanghong Yuan, Feng Shi* and Youquan Deng

Centre for Green Chemistry and Catalysis, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou, 730000, China

A series of silica gel supported nano-Ru catalysts were prepared with sol-gel method using ionic liquids as templates. The catalysts were extensively characterized by XRD, TEM, XPS and BET. The results showed that Ru-C/SiO₂ prepared with suitable amount of BmImBF₄ as template possesses high catalytic activity in the hydrogenation of p-chloro nitrobenzene. Moreover, this catalyst exhibited excellent performance in the shape-selective hydrogenation of nitrobenzenes. The conversion of p-methyl nitrobenzene was 100% and no detectable conversion of 2,6-dimethyl nitrobenzene was observed.