

Ni-Zr-Ce / Al₂O₃ 催化剂上 H₂O₂ 作氧化剂直接使苯氧化胺化一步合成苯胺研究

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摘要 设计制备了 Ni-Zr-Ce/Al₂O₃ 催化剂, 研究了其上用 H₂O₂ 直接将苯氧化胺化合成苯胺的活性。发现在常压、50 °C 的温和条件下, 该催化剂对苯、氨水与 H₂O₂ 直接氧化胺化生成苯胺有较好活性, 并且其对苯胺的选择性远远大于对苯酚的选择性。提高反应原料中氨水对苯的比例, 能提高苯胺的收率, 且不会增加苯酚的生成量。本方法能耗低, 原子利用率高, 为苯胺的绿色合成提供了一条新的路径。

关键词 苯胺 过氧化氢 镍 锆 铈 氧化铝 氧化 胺化反应 苯

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Direct Synthesis of Aniline by Oxido-amination of Benzene with H₂O₂ and Aqueous Ammonia on Ni-Zr-Ce/Al₂O₃ Catalyst

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Abstract The existing aniline production processes tend to be energy and time consuming, as well as pollutant producing. The "greening" of global chemical manufacturing by minimizing energy consumption and waste production has become a major concern for chemical research and chemical industry. In present work, the direct oxido-amination of benzene with hydrogen peroxide and aqueous ammonia on Ni-Zr-Ce/Al₂O₃ catalyst was studied. It was found that with the Ni-Zr-Ce/Al₂O₃ catalyst prepared in present work the production of aniline from benzene, hydrogen peroxide and aqueous ammonia could be realized under mild conditions, that is, at about 50 °C and under atmospheric pressure, and the selectivity of aniline is much higher than that of phenol. Increasing the amount of ammonia used could increase the production of aniline without much effect on the production of phenol. This provides a new greener chemical way for the production of aniline, of which the atomic efficiency is much higher than that of the existing ways.

Key words [ANILINE](#) [HYDROGEN PEROXIDE](#) [NICKEL](#) [ZIRCONIUM](#) [CERIUM](#) [ALUMINIUM OXIDE](#) [OXIDATION](#) [AMINATION](#) [BENZENE](#)

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