

FULL PAPERS

固载Ru基催化剂上二氧化碳加氢合成甲酸II反应条件对催化剂性能的影响

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摘要

考察了在不同反应条件对二氧化硅固载的钌基催化剂上二氧化碳加氢合成甲酸反应活性的影响。结果表明, 当二氧化碳处于超临界状态, 氢压4.0MPa, 反应温度80℃以及PPh₃/Ru为6: 1时, 甲酸的转化频率(TOF)可达

1481.5h⁻¹。固载钌基催化剂的催化性能优于相应的均相钌催化剂, 而且具有易于分离和重复使用等优点。

关键词 [固载, 钌, 甲酸, 二氧化碳, 超临界](#)

分类号

Silica Immobilized Ruthenium Catalyst for Formic Acid Synthesis from Supercritical Carbon Dioxide Hydrogenation II: Effect of Reaction Conditions on the Catalyst Performance

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Abstract The synthesis of formic acid from carbon dioxide and hydrogen using a silica immobilized ruthenium catalyst as precursor has been studied in different reaction conditions. The results revealed that the TOF (turn over frequency) of HCOOH achieved 1481.5 h⁻¹ on immobilized ruthenium catalyst near the critical pressure point of CO₂ with H₂ pressure of 4.0 MPa, reaction temperature of 80 °C and PPh₃/Ru molar ratio of 6: 1. The reaction activity of immobilized catalyst was higher than that of homogeneous catalyst, and the immobilized catalyst also offered the practical advantages such as easy separation and reuse.

Key words [immobilized](#) [ruthenium](#) [formic acid](#) [carbon dioxide](#) [supercritical](#)

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