

TiO₂负载的纳米铑簇合物催化丙酮酸乙酯不对称氢化反应的研究

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摘要 研究了辛可尼定作手性修饰剂修饰的负载型纳米铑簇保物催化剂 (0.5% Rh/PVP-TiO₂) 催化丙酮酸乙酯不对称氧化反应, 在该反应中手性修饰剂辛可尼定不仅具有对产物生成的手性诱导作用, 而且对反应具有明显加速作用; 在优化反应条件后, 反应的TOF和对映选择性分别可以达到58.0 min⁻¹和61.9% e.e.。

关键词 [丙酮酸乙酯](#) [氢化](#) [不对称](#) [辛可尼定](#) [氧化](#)

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Studies on the Asymmetric Hydrogenation of Ethyl Pyruvate Catalyzed by TiO₂ Supported Rhodium Nanocluster

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Abstract In the asymmetric hydrogenation of ethyl pyruvate catalyzed by 0.5% Rh/PVP-TiO₂, the chiral modifier cinchonidine not only induces the enantioselectivity, but also accelerates the reaction rate greatly. A promotion effect of TiO₂ for the asymmetric hydrogenation is observed, when the modified rhodium nanoclusters are supported on TiO₂. The results show that TOF increase from 15.7 to 58.6 min⁻¹ and e.e. values of R(+)-ethyl lactate increase from 42.2% to 60.0% in the hydrogenation of ethyl pyruvate. This suggests that TiO₂ is favourable for the dispersion of Rh/PVP and its stabilization on the support surface. Under the optimum conditions: 298 K, p(H₂) = 6.0 MPa, 4.3 × 10⁻³ mol/L cinchonidine in THF, ethyl pyruvate/rhodium = 942 (molar ratio), TOF and e.e. value are 58.6 min⁻¹ and 61.9%, respectively.

Key words [ethyl pyruvate](#) [HYDROGENATION](#) [ASYMMETRY](#) [cinchonidine](#) [OXIDATION](#)

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