

氧化硅组装纳米Nafion酸催化合成 α -生育酚

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摘要 以自制的Nafion溶液、正硅酸乙酯为原料,通过溶胶-凝胶方法,将Nafion纳米颗粒分散组装到多孔性SiO₂中,制得高比表面积纳米复合物Nafion/SiO₂固体酸催化剂大大提高了Nafion所含酸性中心的暴露率和可接近程度。在非极性溶剂正庚烷和甲苯中,13% Nafion/SiO₂固体酸对 α -生育酚的合成具有很好的选择催化作用。相对于致密性Nafion树脂而言,13% Nafion/SiO₂纳米复合物单位酸中惊扰催化活性增加了10倍。

关键词 [氧化硅](#) [纳米相材料](#) [生育酚](#) [氢醌](#) [溶胶-凝胶法](#)

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Synthesis of α -Tocopherol Using Silica Entrapped Nafion Catalyst

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Abstract The 13% Nafion/SiO₂ nanocomposite with high surface area was prepared by entrapping Nafion resin nanoparticles in a porous silica (viz. an in situ sol-gel method) and used as a catalyst for the synthesis of α -tocopherol by the Friedel-Crafts alkylation- condensation reaction of trimethylhydroquinone and isophytol. The catalytic results were compared with those obtained over Nafion NR50 resin catalyst. Due to the increased accessibility to the reactants of Nafion resin-based acid sites, the nanocomposite showed remarkably enhanced activity for α -tocopherol synthesis (yield > 90%) in nonpolar toluene and n-heptane solvents. The activity per unit weight of Nafion resin in toluene solvent was found to be 10 times higher in the nanocomposite than in Nafion NR50 resin. The nanocomposite catalyst proved to be recoverable from the reaction, but a gradual loss of the catalytic activity was observed with increasing the recycle number.

Key words [SILICON OXIDE](#) [NANOPHASE MATERIALS](#) [tocopherol](#) [HYDROQUINONE](#) [SOL-GEL PROCESS](#)

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