Suzan A Khayyat, Organic Chem Curr Res 2017, 6:1(Suppl)
http://dx.doi.org/10.4172/2161-0401.C1.017

Friedel-Crafts acylation of veratrole with acetic anhydride for the synthesis of acetoveratrone using nanocrystalline ZSM-5

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Acylated aromatic ethers are of commercial importance in fine chemical industries, as many synthetic fragrances and pharmaceuticals contain an acyl group and these ethers are useful intermediates. The acylation of veratrole is an intermediate step in the synthesis of Para acylated veratrole, is useful intermediate for the production of vesnarinone, which is a cardiotonic. Conventional acylation of veratrole have been carried out by using homogeneous acid catalysts such as $AlCl_3$, $FeCl_3$, $ZnCl_2$, HF, etc. The use of these catalysts leads to many problems such as more stoichiometric quantities of catalyst, handling, safety, corrosion of equipment and waste disposal. In order to overcome the difficulties associated with homogeneous catalysts, the development and utilization of solid catalysts are important. During the past few years, various solid acids have been tried for the acylation of veratrole. However, the conversion is still poor. Thus, there still exists scope to develop better catalysts which would catalyze the acylation of veratrole with excellent conversion and selectivity at comparatively low temperature. The present paper aims at liquid phase acylation of veratrole with acetic anhydride over hierarchical porous nanocrystalline ZSM-5 in the temperature range of 60-100°C. Effects of various parameters such as mole ratio of reactants, catalyst loading and temperature on the rates of reaction have been analyzed. High conversion in the acylation of veratrole with acetic anhydride was achieved under mild conditions. The catalyst can be recovered and reused several times without loss of activity and selectivity. The method described here is environmentally benign, and replaces the conventional and hazardous mineral acid catalyst by highly active and reusable catalyst.

Biography

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