

C6 퓨란계 유도체 유래 아디픽산 생산을 위한 촉매 반응

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Efficient catalytic ring-opening coupled with hydrogenation is useful but a challenging reaction when aiming to produce adipic acid (AA) from 2,5-furan dicarboxylic acid (FDCA). Herein, a two-step process for the production of AA from FDCA via tetrahydrofuran-2,5-dicarboxylic acid (THFDCA) is reported with an overall yield of AA of about 98%. For the hydrogenation of FDCA to THFDCA, ruthenium-supported alumina (Ru/Al₂O₃) is found to be an efficient catalyst where ruthenium is economically viable than palladium or rhodium which are the well-known catalysts for furan ring hydrogenation. Moreover, the Ru/Al₂O₃ catalyst can be reused without a significant loss of activity and selectivity until the 4th consecutive run. In the second step, a non-solvent iodide-containing ionic liquid (IL) catalytic system is firstly applied for the ring-opening of THFDCA. The non-solvent IL system not only exhibited superior activity toward AA but also helped reduce the severe corrosion problems caused by a conventional HI catalytic system.

Keywords: Adipic acid, 2,5-furan dicarboxylic acid, tetrahydrofuran-2,5-dicarboxylic acid, hydrodeoxygenation.