Title describing the methodology/facility/set-up: (Maximum 15 words)

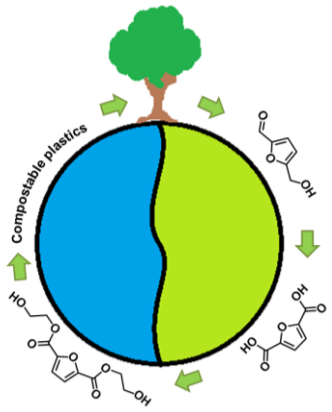
Synthesis of FDCA as an environmental benign raw material for the manufacturing of biomass based plastic materials.

Keywords: (Maximum 5)

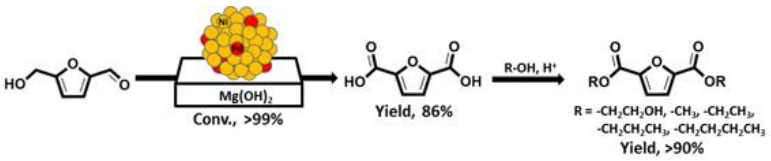
Biomass waste, FDCA, Biodegradable Plastic, Catalytic reactions, Aerial oxidation

Write-up: (Maximum 500 words)

Fast depletion of fossil resources and environment impacts has stimulated current research to utilize renewable biomass resources for the production of fuel and different fine chemicals. 5-Hydroxymethyl-2-furfural (5-HMF), produced from cellulose or cellulose derived carbohydrates, is a potential platform compound for the sustainable synthesis of various pharmaceuticals and industrial applicable chemicals. A complete aerial oxidation of 5-HMF to furan-2,5-dicarboxylic acid (FDCA) is one of the most appealing transformation, as FDCA has wide applications in textiles, coating, packaging. Because FDCA, is an important building block for the production of biomass-based polymers to replace petroleum-derived terephthalic acid, a crucial component in the production of polyethylene terephthalate (PET) and polybutylene terephthalate (PBT). Therefore, it is not surprising that FDCA has been listed in top-12 valuable chemicals derived from biomass, according to the U. S. Department of Energy Report. In this direction, we have recently explored simple and cost effective bimetallic Ni-Pd alloy nanoparticles catalyst for the facile transformation of HMF to FDCA under aerobic-aqueous reaction conditions. Moreover, immobilizing the active catalysts on basic support may eliminate the use of external base.



Biomass to compostable plastics: The catalytic route



Synthesis of furan diesters from catalytically sythesized FDCA