Salep as a biological source for the synthesis of biochar with utility for the catalysis

Samahe Sadjadi¹, [Majid M. Heravi](#)², Fatemeh Ghoreyshi Kahangi³

1- Gas Conversion Department, Faculty of Petrochemicals, Iran Polymer and Petrochemicals Institute, Tehran, Iran

2- Department of Chemistry, School of Science, Alzahra University, Tehran, Iran

3- Department of Chemistry, University Campus 2, University of Gilan, Rasht, Iran

Abstract

Hydrothermal carbonization of salep as a domestic biosource was carried out to afford a biochar, BC, with exceptional catalytic activity. BC can be further magnetized by incorporation of magnetic nanoparticles to furnish a magnetic catalyst, BC-Fe, with improved recovery and recyclability for the hydrogenation of nitroarenes in the absence of any precious metal. BC-Fe was also applied as a catalyst support for the immobilization of Pd nanoparticles and development of an efficient, biocompatible and cost-effective catalyst, Pd@BC-Fe, with utility for the oxidation of benzyl alcohols under mild reaction condition in a selective manner to afford corresponding acids in high yields. The study of the recyclability of the catalyst confirmed high recyclability of Pd@BC-Fe.

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