

Organically multi-functionalized rice husk silica xerogel-anchored Ni and Pt as swift nanocatalysts for selective production of acetaldehyde from ethanol

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With environmental benignity and waste reduction in mind, a resilient catalyst based on silica extracted from local rice husk (RHS) after acid digestion and thermal treatment was designed in this work. The mesoporous silica (MS) was produced through textural modification of RHS by cetyltrimethyl-ammonium bromide (CTAB) as a structure-directing agent. The surfaces of RHS xerogel (SG) and CTAB-MS were organically functionalized with mixed amine-terminated silane groups through an easy and swift pathway via condensation. Both nickel and platinum nanoparticles were anchored to the surface of the functionalized silica samples. N₂ adsorption, XRD, FTIR, TEM and TGA-DSC techniques were used for characterizing the as-functionalized catalytic systems. The metal anchored-functionalized silica catalysts were applied in ethanol dehydrogenation at different temperatures for selective production of acetaldehyde, using a fixed-bed flow reactor. Nanonickel-functionalized silica xerogel (F-SG-Ni) exhibited the highest selectivity toward acetaldehyde production.

Biography

Nasser H. Shalaby has completed his B.Sc. at the age of 22 years (Cairo university, 1988), from 1/1/1989 to 30/6/1990 serve the compulsory national service, from 07-1991 to 07- 1995, Chemist at Saudi Arabia (Water Treatment), from 08-1995 to 09 -2005, Chemist at Egyptian Financial and Industrial Company (sulphuric acid and phosphatic fertilizers), from 09-2005 to 07-2009, Manager of Laboratories and Quality Control at Suez Company for Fertilizers Production, from 07-2009 till now, researcher at Egyptian Petroleum Research Institute. In 04 /2007, he has completed M.Sc on Nanocomposite polymers from Tanta University. In 01/ 2013 he has completed his Ph.D. on Nanocatalysis from Ain Shams University.

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