عنوان مقاله:

An Efficient One-Pot Green Approach for the Synthesis of A-aminonitriles with Alsba- 15 as Nano Tubular Catalytic Reactor

محل انتشار:

فصلنامه انرژی و محیط زیست ایران, دوره 8, شماره 4 (سال: 1396)

تعداد صفحات اصل مقاله: 13

نویسندگان:

M Krishna Kolli - *Chemistry Division, School of Advanced Sciences, VIT University, India-۶۰۰ ۱۲۷ , Department of Medicinal Chemistry, GVK Biosciences Pvt. Ltd, India-۵۰۰ ۰۷۶*

S Reddy Dadireddy - *Department of Medicinal Chemistry, GVK Biosciences Pvt. Ltd, India-۵۰۰ ۰۷۶*

P Elamathi - *Chemistry Division, School of Advanced Sciences, VIT University, India-۶۰۰ ۱۲۷*

G Chandrasekar - *Chemistry Division, School of Advanced Sciences, VIT University, India-۶۰۰ ۱۲۷*

خلاصه مقاله:

Nanoporous heterogeneous AlSBA-15 (x) type aluminosilicate catalyst with different nSi/nAl ratios (x = 41, 129, and 210) was synthesized using hydrothermal method. AlSBA-15 catalysts were characterized by XRD, N2 sorption, TPD-NH3, FT-IR, SEM and TEM. XRD analyses of AlSBA-15 catalysts confirmed the presence of wellordered crystalline structure with p6mm symmetry. N2 isotherm of AlSBA-15 catalyst materials showed a type IV adsorption isotherm with H1 hysteresis loops. The specific surface area and specific pore volume of the AlSBA-15 catalysts are in the rage from 480 to 757 m2/g and from 0.65 to 0.95 cm3/g, respectively. SEM analysis of AlSBA-15 (41) revealed a worm-like particle morphology comprising particles in a size range of 3 μm with the co-existence of smaller particles of ca. 1 μm size. A distinct approach adopted for the synthesis ofα-aminonitriles using heterogeneous nanoporous AlSBA-15 catalyst via Strecker reaction. This one-pot, three component system of amines (primary/secondary), carbonyl compounds (aldehydes/ketone) and TMSCN compounds proceed excellently in the presence of AlSBA-15 catalyst in water medium at room temperature (RT). The major advantages are excellent yield, short reaction time, high chemo-selectivity, simple experimental procedure, recyclability of the catalyst, easy work up procedure. This one-pot synthesis consists of two consecutive steps: (1) imine formation from amine and aldehyde/ketone and (2) cyano addition to imine. The findings suggest that catalyst is recyclable and can be reused up to six cycles

کلمات کلیدی:

,α-Aminonitriles,One-pot,AlSBA-15,Amines,Nanotubular reactor,Heterogeneous catalysis,Trimethylsilyl cyanide