



Synthesis of Unusual Large Pore Mg Substituted Alumino Phosphate (MgAlPO₄) Mesoporous Molecular Sieve and its Catalytic Activity

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ABSTRACT

The substitution of aluminium by magnesium in the aluminophosphate framework (MgAlPO₄) by a simple synthesis using anionic sodium dodecyl sulphate (SDS) as surfactant leads to an active, selective and recyclable catalyst for the liquid and vapour phase polymerisation of styrene. The resulting material was characterized by means of FT-IR, BET surface area measurements, thermogravimetric analysis and temperature programmed desorption. With the aid of SDS, MgAlPO₄ material with the surface area and unusual large pore diameter of 52 m² g⁻¹ and 28.7nm, respectively, were successfully developed in order to carry out large organic molecules transformation reactions. The TPD profile illustrates the presence of strong acid sites in the MgAlPO₄ frame work. Thus, it is found that mesoporous MgAlPO₄ acts as an active initiator and catalyst for the vapour phase polymerisation of styrene. The influence of temperature was examined for maximum conversion of styrene.

Keywords: Mesoporous magnesium aluminophosphate, Isomorphous substitution, Large pore diameter, Strong acid sites
