Title: Incorporation of niobium in SAPO-11 materials: Synthesis and characterization

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Abstract: The present work concerns a new synthesis approach to prepare niobium based SAPO materials with AEL structure and the characterization ofNb species incorporated within the inorganic matrixes. The SAPO-11 materials were synthesized with or without the help of a small amine, methylamine (MA) as co-template, while Nb was added directly during the preparation of the initial gel. Structural, textural and acidic properties of the different supports were evaluated by XRD, TPR, UV-Vis spectroscopy, pyridine adsorption followed by IR spectroscopy and thermal analyses. Pure and well crystalline Nb based SAPO-11 materials were obtained, either with or without MA, using in the initial gel a low Si content of about 0.6. Increasing the Si content of the gel up to 0.9 led to an important decrease of the samples crystallinity. Niobium was found to incorporate the AEL pores support as small Nb2O5 oxide particles and also as extra framework cationic species (Nb5+), compensating the negative charges from the matrix and generating new Lewis acid sites.

Author Keywords: Niobium; SAPO-11; Methylamine; Acidity; AEL Structure

KeyWords Plus: Molecular-Sieves; Containing MCM-41; Catalysts; Acidity; Crystallinity; Adsorption; Frameworks; Zeolites; Silica; Oxide

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