1st EUROWORKSHOP ON ZEOLITES

"Zeolite Synthesis : From Dream to Production",

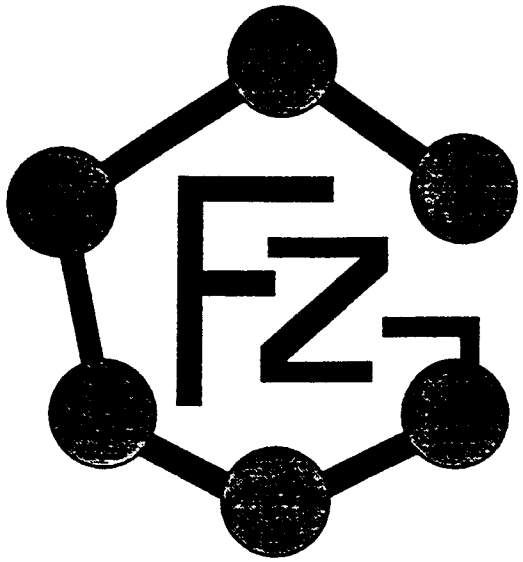
March 17-20, 1996,

Ronce-Les-Bains (La Rochelle) - FRANCE

SCIENTIFIC PROGRAM

AND

ABSTRACTS



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INCORPORATION OF COBALT IN THE AFR STRUCTURE AND CHARACTERIZATION OF THE RESULTING ACID SITES

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The AFR structure with the silicoaluminophosphate composition (SAPO-40) was known since 1984. However the synthesis of $AlPO_4$-40 and $MeAPO_4$-40 (Me: Co, Zn) was only reported in 1994 [1], hence offering new potential applications of this structure.

In this work, two samples of $CoAPO_4$-40 having 1.6 and 3.0% of Co (mol T atom) incorporated in the framework and one of CoAPSO-40 with 3.6% of Co and 2.4% of Si were prepared, following an optimisation of the method described by Sierra et al. [1]. A sample of SAPO-40 with 7% of silicon was also prepared, following the method described by N. Dumont et al. [2].

Characterization by powder X-Ray Diffraction and Scanning Electron Microscopy was carried out to check the purity of the AFR phase. The results show the typical SAPO-40 XRD pattern and the plate-like morphology already reported [3].

The incorporation of cobalt in the framework was probed by UV-Vis spectroscopy and indirectly by FTIR spectroscopy and catalytic tests. The model reaction used was the isomerization of m-xylene.

The UV-Vis spectra show the typical bands due to the tetrahedral cobalt substituted in the framework of aluminophosphates and silicoaluminophosphates. The FTIR spectroscopy and the catalytic tests clearly show the presence of acid sites in these materials and the possibility of oxidise and reduce the cobalt atoms without destruction of the structure. The catalytic tests also show the higher activity of the materials with cobalt when compared with a SAPO-40 sample with higher silicon content.

The results found in this work contribute to clarify some similarities and differences between the method of synthesis of SAPO-40 and the one used to synthesise the CoAPO's and CoAPSO samples.

References

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[3] N.Dumont, Z.Gabelica, E.G. Derouane and L.B. McCusker, *Microporous Mater.*, 1 (1993) 149.