Germanium Zeotypes

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In the earlier 1990s, two interesting germanates [1] were reported, but it was not until the end of the decade that the interest on the microporous germanium zeotypes appeared with great force [2,3], so that in the six later years about thirty paper on the purely Ge/O system have been reported. As it is known, in these zeotypes the secondary building unit (SBU) can be formed by Ge atom in tetrahedral, trigonal bypiramidal and octhahedral coordination, these plolyhedra being connected by sharing vertex, edges or faces. Anions (oxygen atoms or hydroxyl groups) being also frequently in 1-, 2-, or 3- coordination. This variability in coordinative modes allows for the generation of many different SBUs, different kinds of connection among them, and thus a plethora of structural possibilities. These compounds are obtained hydrothermally, by controlling a good number of variables, especially to obtain single crystals. Mild conditions are used (100 – 200^{o}C, 1-20 atmospheres in the reactors of 40-120 ml volume), the time of reactions being varied from a few hours up to several weeks, depending on the material to obtain. Starting from germanium dioxide or germanium alkoxides in water or non-water media, different templates are chosen specially for each case (organic amines or transition metal complexes, basically). Results of synthesie, structures and catalytic properties of several new microporous germanium zeotypes obtained in our laboratory will be presented, as well as some structural relations established among them

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