

Nanopores such as molecular sieves, catalysts and containers

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It is possible to prepare crystalline nanoporous materials with high thermal and hydrothermal stability, with frameworks formed by SiO₂ or SiO₂-Al₂O₃ tetrahedras. It is possible to prepare the nanomaterial with pores within the size of different molecules and in this way they can act as molecular sieves. We will show by controlling pore dimension and framework vibration it is possible to separate gas molecules with differences in dimensions lower than 0.02nm. We will also show how to introduce into the pores in a one pot synthesis metals ranging from single atoms to nanoclusters and nanoparticles.

Finally we will present how the reactivity of metal or other active sites introduced within the pores can act, simultaneously, for molecular separation and catalytic transformations.