Open the blackbox! Some mechanisms of formation of porous solids.
Gérard Férey

Porous solids are strategic materials and a tremendous number of new solids with interesting properties and applications are now described. Before being characterized, most of them are obtained by a trial and errors solvo/hydrothermal chemistry, without any experimental mechanistic approach, thus preventing from a truly rational ‘tailor-made’ synthesis of these important materials.

Using a series of complementary in situ techniques (NMR, X-ray and diffraction EXAFS, computer simulation…) for following in real time the reaction, allows to shed some light on the steps of the formation of these solids from a supramolecular approach. This strategy is applied to both purely inorganic (metal phosphates) and hybrid inorganic-organic frameworks (MOFs). This lecture will show that, from these experimental results, a structural prediction of new structures becomes possible.

Some references.

**NMR of microporous compounds: from in situ reactions to solid paving.**

**In situ NMR, Ex-situ XRD and SEM study of the hydrothermal crystallization of nanoporous aluminium trimesates MIL-96, MIL-100 and MIL-110.**

**Hybrid Porous Solids: Past, Present, Future.**
G. FEREY.
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