

# Molecular Metal Phosphate Complexes

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## Abstract

Zeolites and structurally related metallophosphates are an important class of inorganic materials. Their useful physical and chemical properties predetermine these materials for applications as desiccants, sorbents, catalysts, catalyst supports or ion exchangers.

Aqueous synthetic methods were mainly used for the preparation of various metallophosphates. We are interested in developing nonaqueous alternative routes to these materials through molecular building units possessing reactive functional groups to form framework systems in subsequent reaction steps.

We focused on the synthesis of monometallic molecular Al, Ti, Zr and Zn metallophosphates. We performed condensation reactions between selected derivatives of phosphoric acid and metal alkyls, alkoxides or amides, which provided molecular metallophosphates of different shapes and metal nuclearities. (Fig. 1)

The prepared products were characterized by analytical and spectroscopic methods (multinuclear NMR, IR, ESI-MS, thermal analysis). The single-crystal X-ray diffraction analysis revealed inorganic cores wrapped in the organic coats formed by reactive functional groups. Potential application of the prepared compounds as building blocks for porous frameworks or precursors for CVD deposition of thin layered films on various substrates will be discussed.

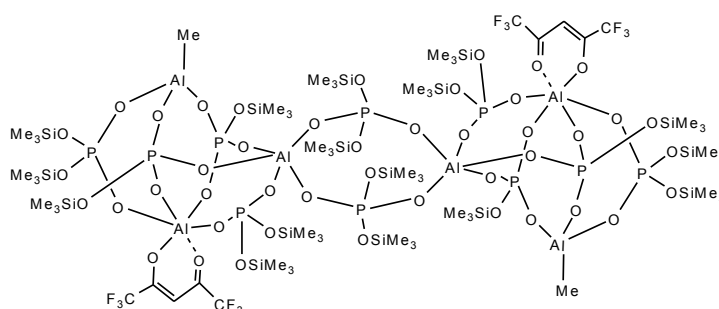


Fig. 1: Molecular structure of aluminum phosphate