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MOF Materials: New Architectures in Material Chemistry

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The research area of metal-organic frameworks (MOFs) has experienced a drastic development during the past decade. The intense interest in these materials is driven by their interesting network topologies, their potential applications and the ever-growing demand for new materials with desired structures and properties. Up to the moment, transition metal based MOFs are the most studied, and the chemistry of Lanthanide and Alkaline-Earth based MOFs is not as much explored, maybe because these elements have been always regarded as less suitable metal centers, whose coordination numbers are too high and/or variable so that their coordination geometries are hard to control. When designing a new material, depending on the required property, different metallic cations (connectors) and ligands (linkers) have to be used, having this in mind, some examples related with: Gas and Vapor Storage, Heterogeneous Catalysis, Magnetic Properties, Optical Properties, and Electric Conductivity will be shown. The topological net of each material will be analyzed.