Abstract “MOFs: MATERIALS OF FUTURE OR FUTURE OF MATERIALS”

Porous metal–organic frameworks (MOFs) are continuously attracting much attention in a wide range of applications such as storage of energy-related gases (H2 and CH4), catalysis, CO2 capture/separation, hydrocarbon separation, bio-inorganic and medicinal chemistry because of their highly porous and regular structural properties. MOFs can be formed from a wide variety of inorganic fragments, bridging (linkers) and ancillary ligands. For a given shape of fragment there is only a small number of possible high-symmetry topologies resulting in a stable network.
A survey on transition metal-containing MOFs built up with azoles, poly(azole)- and poly(pyrazolate)-based ligands will be here presented.
The synthetic method(s) yielding to their isolation will be complemented by a description of the main structural aspects and of their functional properties and also by a demonstration that upon tuning reaction conditions, stereochemical preferences of the metal ions and/or size, shape and substituents of the ligands (hence their electronic and steric properties), thermally robust MOFs and PCPs with relevant functional properties as catalysis, gas adsorption or separation and antibacterial activity can be obtained.