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Purposeful molecular design of inorganic-organic hybrid architectures based Keggin-type polyoxometalates: luminescence properties and Monte Carlo simulation studies

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Nowadays, the construction of inorganic-organic networks through crystal engineering has been the subject of much interest. Polyoxometalates (POMs), which are nanosized metal-oxide clusters and unusually effective inorganic ligands, have been widely investigated because of their distinctive topological structures and versatile applications. Due to importance of this field, a novel series of inorganic-organic hybrid materials based Keggin-type POMs and lanthanoids coordination compounds have been successfully synthesized under hydrothermal conditions. In addition, the influences of steric hindrance of organic ligands, in situ transformation of organic ligand, charge density of POM, size of the lanthanoid ions and synthetic conditions on assembly of these POM-based hybrids have been systematically discussed [1-3]. The luminescent properties of some of these hybrids have been investigated. Monte Carlo simulation has been employed for predicting the ability of some of these hybrids to capture CH_4 and CO_2 and also to separate CH_4/H_2 and CO_2/N_2 mixtures.

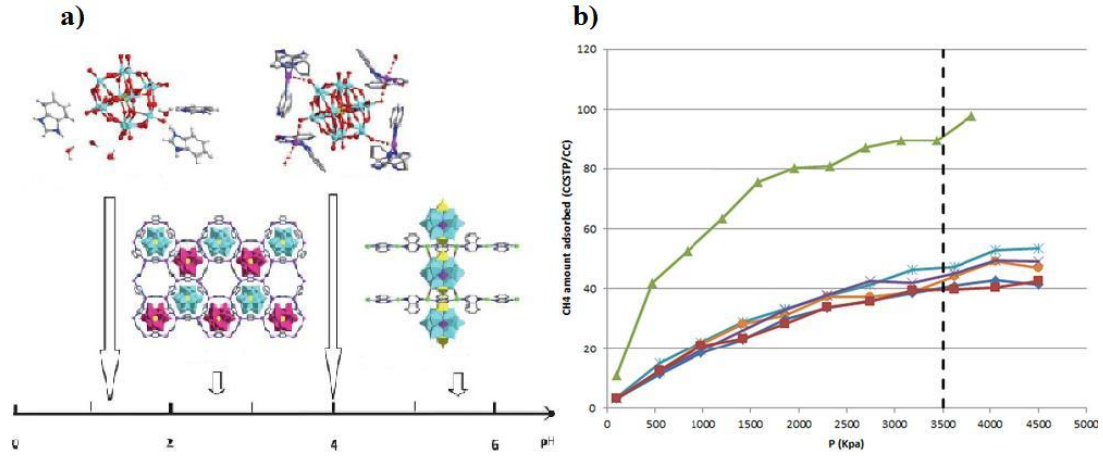

Fig. 1 a) Importance of experimental conditions in synthesis of inorganic–organic hybrid based Keggin-type POMs, b) simulated isotherms of CH_4 at 298K for some of these hybrids.

References

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