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Towards Various Nanotechnological Applications by Metal-Organic Frameworks and Polyoxometalate-Based Frameworks: Structure-Activity Relationships

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In the last three decades, metal-organic frameworks (MOFs) have been established as excellent candidates for interlacing complementary functions to realize high surface area materials for molecular separations, stimuli-responsive and dynamic crystalline frameworks. Structure-activity relationships (SAR) have consistently embellished the chemistry of these materials and advanced their applications [1-3].

Compared to MOFs, the development of polyoxometalate (POM)-based frameworks is still limited. POMs as one kind of inorganic crystalline material with oxygen-rich surfaces, strong acidity, and redox capability have been widely investigated in materials science. These clusters have been widely used as secondary building units (SBUs) for the fabrication of hybrid materials with the aid of bridging organic ligands or coordination complexes [4-6]. In this lecture, the applications of MOFs and POM-based frameworks in catalysis, magnetism, and analytical sample preparation, and drug detection have been discussed.

Keywords: Porous materials, Metal-organic frameworks, Polyoxometalate-based frameworks.

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