Special Issue Reprint

Metal Organic Frameworks

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Metal–organic frameworks (MOFs) are among the most promising novel materials, belonging to a new class of crystalline materials that consist of a coordination bond between metal clusters (e.g., metal–carboxylate clusters and metal–azolate clusters) and metal atoms, or rod-shaped clusters and multidentate organic linkers that contain oxygen or nitrogen donors (carboxylates, azoles, nitriles, etc.), thus forming a three-dimensional structure. The concept of MOFs was first introduced in 1990, at which time they were initially used in catalysis, gas separation, membranes, and electrochemical sensors. Since then, the number of analytical applications implementing MOFs as sorbents in sorptive sample preparation approaches has been steadily increasing. This is reinforced by the fact that, at least theoretically, an infinite number of structures can be designed and synthesized, thus making tuneability one of the most unique characteristics of MOF materials. Moreover, they have been designed in various shapes, such as columns, fibers, and films, so that they can meet more analytical challenges with their improved analytical features. Their exceptional properties have attracted the interest of analytical chemists who have taken advantage of their unique structures and properties and have already introduced them into several sample pretreatment techniques, such as solid-phase extraction, dispersive SPE, magnetic solid-phase extraction, solid-phase microextraction, stir bar sorptive extraction, etc. This Special Issue presents recent developments in the synthesis and application of MOFs.

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