MOFs materials special review issue

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New analyses of more than 4,000 scientific studies have concluded that a family of "miracle materials" called MOFs have a bright future in products and technologies — ranging from the fuel tanks in hydrogen-powered cars to muting the effects of the greenhouse gas carbon dioxide — that are critical for solving some of the greatest global challenges of the 21st century. The 18 articles examining 4,283 pieces of research on MOFs published in the past appear in a special edition of the ACS' journal *Chemical Reviews*.

Discovered 15 years ago, more than 3,000 metal-organic frameworks, or MOFs, have been made so far, and they represent one of today's hottest fields of research. These ultra-highly-porous solids consist of metals like zinc or copper linked together by "struts" of organic chemicals to form networks of empty pores almost like the pores in a kitchen sponge. Up to 90 percent of a MOF consists of empty space that could be filled with hydrogen, carbon dioxide, medications for slow-release in the human body or a range of other materials. MOFs have such an enormous internal surface area that a single ounce, unraveled and spread out, could cover the surface of 280 football fields.

The special issue of *Chemical Reviews* consists of 18 articles that analyze research on MOF structures, applications, synthesis and optical and ferroelectric properties. They identify the current state of knowledge on the topic, prospects for commercial and industrial applications and major problems yet to be resolved. The articles tie together advances from several groups from around the world, marking the progress made thus far in MOF research.

"Since the 1990s, this area of chemistry has experienced almost unparalleled growth, as evidenced by not only the sheer number of research papers published but also the ever-expanding scope of the research," say Hong-Cai Zhou, Jeffrey R. Long and Omar M. Yaghi, in an editorial introducing the issue. The special issue comprises the most up-to-date contributions from leading MOF experts and serves as a valuable resource for anyone curious about MOFs.

More information: pubs.acs.org/journal/chreay

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