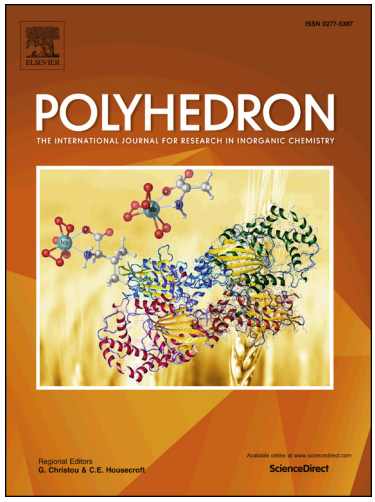

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MOFs-derived porous nanomaterials for gas sensing

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Abstract

Developments of the industry lead to the emission of gaseous pollutants. Emissions management systems need real-time feedback, which can be proved by gas sensors, to control the emission. The key factor to gas sensors is gas-sensing material with high sensing performance. Metal-organic-frameworks (MOFs) stand for a class of porous material which is combined by organic linkers and metal ions with strong bonds. MOFs can possess large pore volume, high surface area and excellent chemical stability, by careful selection of constituents. Researches on syntheses, structures and properties of MOFs have indicated that they are promising materials for various types of gas sensors. In addition to direct use, MOFs also have been used as sacrificial templates/precursors for preparation of various functional gas-sensing nanomaterials, which showed high gas-sensing response, stable repeatability and so on. In this review, we aim to present the recent development of MOFs-derived nanomaterials applied in gas sensors. Examples of MOFs-derived nanomaterials in the gas sensing of acetone, ethanol, benzene, toluene, xylene, formaldehyde and hydrogen sulfide are then detailed. Finally, an outlook in terms of future challenges is also discussed.

Keywords: MOFs; Metal oxide semiconductor; Gas sensing.