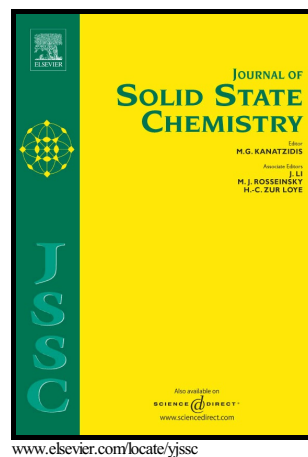


Author's Accepted Manuscript

Cu- and Zr-based Metal Organic Frameworks and their Composites with Graphene Oxide for Capture of Acid Gases at Ambient Temperature

Jeewan Pokhrel, Nidhika Bhoria, Chao Wu, K. Suresh Kumar Reddy, Haris Margetis, Stavroula Anastasiou, Gigi George, Vikas Mittal, George Romanos, Dimitrios Karonis, Georgios N. Karanikolos



PII: S0022-4596(18)30306-2
DOI: <https://doi.org/10.1016/j.jssc.2018.07.022>
Reference: YJSSC20303

To appear in: *Journal of Solid State Chemistry*

Received date: 23 May 2018
Revised date: 13 July 2018
Accepted date: 19 July 2018

Cite this article as: Jeewan Pokhrel, Nidhika Bhoria, Chao Wu, K. Suresh Kumar Reddy, Haris Margetis, Stavroula Anastasiou, Gigi George, Vikas Mittal, George Romanos, Dimitrios Karonis and Georgios N. Karanikolos, Cu- and Zr-based Metal Organic Frameworks and their Composites with Graphene Oxide for Capture of Acid Gases at Ambient Temperature, *Journal of Solid State Chemistry*, <https://doi.org/10.1016/j.jssc.2018.07.022>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Cu- and Zr-based Metal Organic Frameworks and their Composites with

Graphene Oxide for Capture of Acid Gases at Ambient Temperature

Jeewan Pokhrel¹, Nidhika Bhoria¹, Chao Wu¹, K. Suresh Kumar Reddy¹, Haris Margetis^{1,2}, Stavroula Anastasiou¹, Gigi George^{1,3}, Vikas Mittal¹, George Romanos⁴, Dimitrios Karonis², Georgios N. Karanikolos^{1,5*}

¹Department of Chemical Engineering, The Petroleum Institute, Khalifa University of Science & Technology (KU), P.O. Box 2533, Abu Dhabi, UAE

²School of Chemical Engineering, National Technical University of Athens, Athens 157 80, Greece.

³Department of Chemistry, C.M.S College, Kottayam, Kerala, India, 686001.

⁴Institute of Nanoscience and Nanotechnology (INN), Demokritos National Research Center, Athens, 153 10, Greece.

⁵Center for Catalysis and Separation, Khalifa University of Science & Technology, P.O. Box 127788, Abu Dhabi, UAE

*Corresponding author email: georgios.karanikolos@ku.ac.ae

Abstract

Capture of acid gases (CO₂ and H₂S) by liquid solvent absorption is the common industrial practice, yet capture relying on solid adsorbents is increasingly gaining interest as potential alternative towards less energy-demanding operations. Herein, we developed and examined various metal organic frameworks (MOFs) bearing Cu- and Zr- metal clusters and their composites with graphene oxide (GO), and evaluated their performance for CO₂ and H₂S adsorption. Specifically, UiO-66, UiO-66-NH₂, HKUST-1, and their GO composites were grown, subjected to structural, morphological, and textural characterization, and subsequently evaluated for their adsorption capacity and selectivity at ambient temperature. The crystallinity of the parent MOFs was preserved upon *in-situ* growth of the MOF/GO composites, while incorporation of GO yielded uniformly-shaped and well-dispersed MOF crystals resulting in enhanced sorption kinetics, and increased the pore volume compared to

Download English Version:

<https://daneshyari.com/en/article/7757619>

Download Persian Version:

<https://daneshyari.com/article/7757619>

[Daneshyari.com](https://daneshyari.com)