**Amino-functionalizedBio based Zirconium Metal-Organic Framework MIP-202 for water capturing Applications**

Marwa El-Kady1,2,a\*, Hassan Shokry3,4,b, Kamal E. Diab1,c, Saad Mahmoud5,d,Raya Al-Dadah5,e

1Chemical and Petrochemical Engineering Department, Egypt-Japan University of Science andTechnology (E-JUST), New Borg El-Arab City 21934, Alexandria, Egypt

2 Fabrication Technology Department, Advanced Technology and New Materials Research Institute (ATNMRI),City of Scientific Research and Technological Applications (SRTA-City), New Borg El-Arab City 21934,Alexandria, Egypt

3Environmental Engineering Department, Egypt-Japan University of Science and Technology (E-JUST),New Borg El Arab City 21934, Alexandria, Egypt

4 Electronic Materials Researches Department, Advanced Technology and New Materials ResearchInstitute (ATNMRI), City of Scientific Research and Technological Applications (SRTA-City),New Borg El-Arab City 21934, Alexandria, Egypt

5 Department of Mechanical Engineering, University of Birmingham, Edgbaston, Birmingham B152TT, UK

a marwa.elkady@ejust.edu.eg,bHassan.shokry@ejust.edu.eg, ckamalediab1@gmail.com, dS.M.MAHMOUD@bham.ac.ukeR.K.AL-DADAH@bham.ac.uk,

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**Abstract.**

The discovery of a highly efficient water uptake at wide range of relative humidity is very challenging. Metal-Organic Frameworks (MOFs) have shown great interest as water capturing materials in the past 10 years due to their functionality, their high porosity and water capturing capability. However, it is challenging to synthesis bio-based MOFs for water sorption applications since the majority of reported MOFs as water harvesters are constructed from sources coming from petrochemical industries, and their lack of biocompatibilitythat hindered them from their wide use in many applications. Herein, we report the water-sorption properties and potential use of a bio-based MOF called MIP-202 synthesized from bio-based ligands and water-based synthesis for water harvesting at different relative humidity ranging from 0.1 to 0.9 P/P0. The as-synthesised MOF MIP-202, constructed from Zirconium metal as a cluster and aspartic acid as an amino acid as a ligand, showed uptake of 0.8 g/g water at relative humidity of 30% relative humidity while it showed 14 % uptake at 0.9 relative pressures. Moreover, thecyclic stability and performance for the as-synthesised MOF were evaluated. It showed a good stability and cyclic performance over four cycles. The physicochemical properties of fabricatedMIP-202 Bio- MOF were evaluated using BET surface area, powder X-ray diffraction, and scanning electron microscopy for porosity, structural and morphological confirmation respectively.The results provide an investigated insight into the utilization of MIP-202 for water sorption applications.

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