USE OF METAL ORGANIC FRAMEWORKS (MOFs) IN RECHARGEABLE ZINC-AIR BATTERIES

M. Vayenas[1], Chr. Vaitsis[1], G. Sourkouni[2,3], Chr. Argirusis[1,2,3,*]

[1]School of Chemical Engineering, National Technical University of Athens, 15780, Athens, Greece

[2]Institut für Energieforschung und Physikalische Technologien, Clausthal University of Technology, Leibnizstr. 4, 38678 Clausthal-Zell., Germany

[3]Clausthaler Zentrum für Materialforschung (CZM), Agricola Str. 2, 38678 Clausthal-Zell., Germany

*(*amca@chemeng.ntua.gr*)

ABSTRACT

Metal Organic Frameworks (MOFs) is a class of porous, crystalline materials, which consist of metal centers (metal complexes or metal ions) and organic linkers. Those structures demonstrate physicochemical properties, such as high surface area, open metal sites and large void space. Tuning the shape and size allows various morphologies, while the synthesis and initial conditions can be adjusted depending on the final applications, which range in a wide spectrum, including gas storage/separation, catalysis, dye/toxic substance removal and electrode materials, as well as other electrochemical applications [1].

Rechargeable batteries with zinc anode are a very promising technology with an immense increase in worldwide research, due to high energy density, safety, low cost and abundance of crafting materials. Nevertheless, difficulties still emerge, which prevent mass production and everyday applications. One of the greatest obstacles in zinc batteries' commercial application is the small number of charge/discharge cycles when liquid electrolytes are used. The redeposition of zinc during the charge/discharge cycle creates dendritic formations that result in battery short-circuit [2-5]. In this work certain MOFs are examined for their applicability to rechargeable zinc-air batteries with improved performance and uniform zinc deposition.

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