

# **Morphology-Driven Electrochemical Attributes of Cu-MOF: A High-Performance Anodic Material for Battery Supercapacitor Hybrids**

Noshaba Shakeel<sup>a, d</sup>, Junaid Khan<sup>b, c \*\*</sup>, Abdullah A. Al-Kahtani<sup>e</sup>

<sup>a</sup>Department of Physics, Abbottabad University of Science and Technology, Khyber Pakhtunkhwa, Pakistan

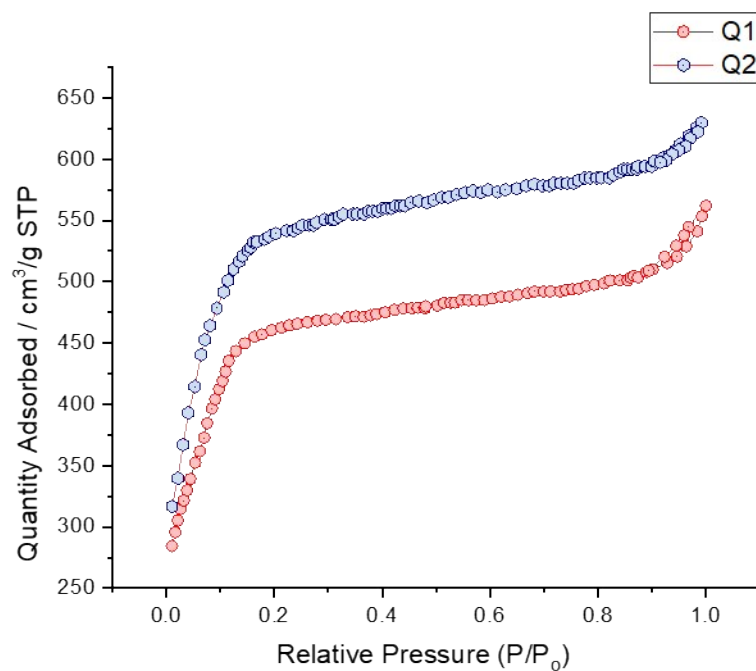
<sup>b</sup>Department of Physics, Government Postgraduate Collage No.1, Abbottabad, Khyber Pakhtunkhwa, Pakistan

<sup>c</sup>Department Of Higher Education Achieves and Libraries, Government of Khyber Pakhtunkhwa, Pakistan

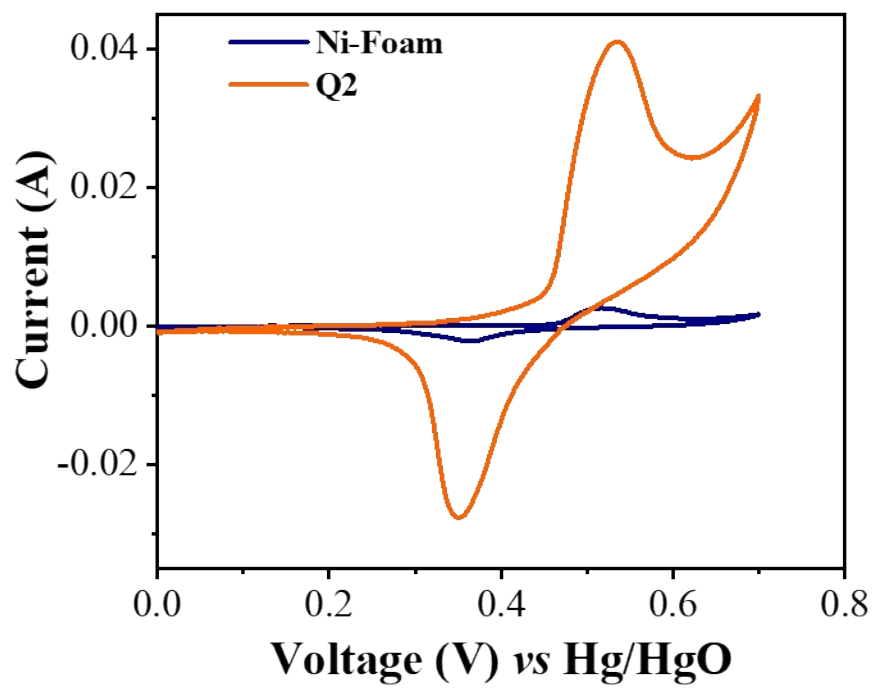
<sup>d</sup>Department of Chemical and Bilogical Engineering, Gachon University, 1342 Seongnam-daero, Seongnam13120, Republic of Korea

<sup>e</sup>Chemistry Department, Collage of Science, King Saud University, P. O. Box 2455, Riyadh-11451, Saudi Arabia

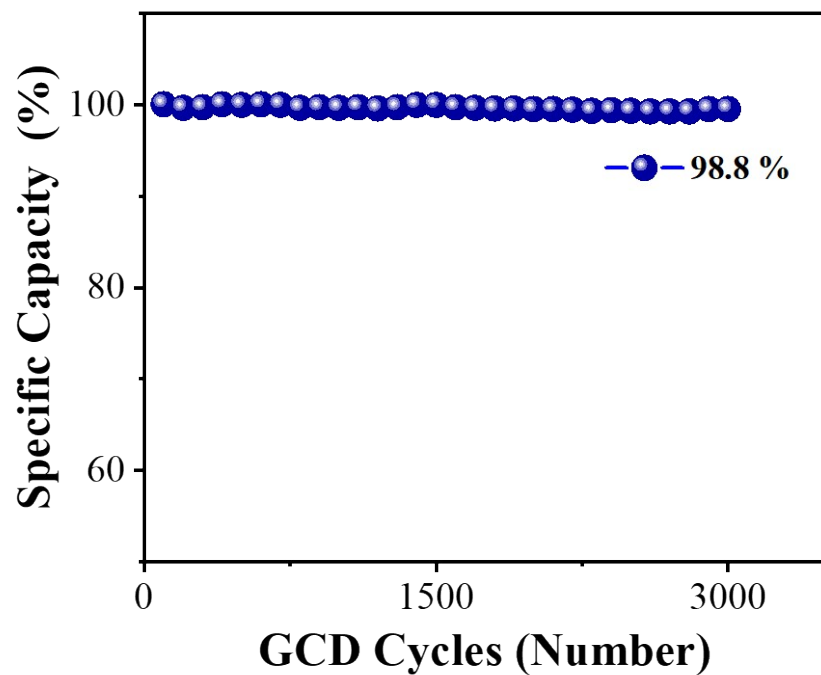
\*Email: [junaidkhan.nanotech@gmail.com](mailto:junaidkhan.nanotech@gmail.com)



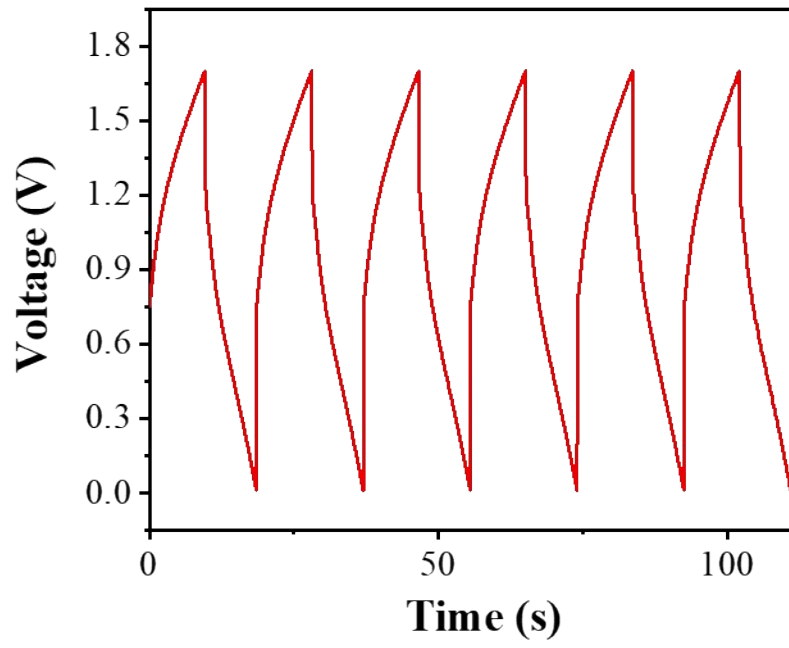
**Figure S1:** The nitrogen adsorption-desorption isotherm of the Cu-Metal-Organic Framework measured at 77 K. The isotherm exhibits a characteristic type I loop, indicative of porous material. The BET calculated surface area from isotherm is 1750 and 2100 m<sup>2</sup>/g, and the pore size distribution analysis confirms the presence of mesopores with a pore volume of 0.8 and 1.0 cm<sup>3</sup> /g for Q1 and Q2 respectively.



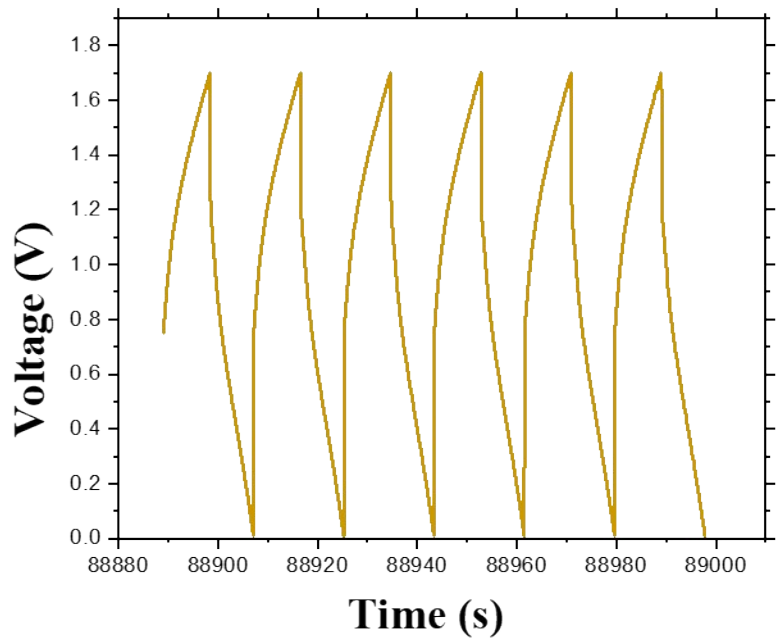
*Figure S2: CV of Q2 and bare Ni-foam observed at 3 mV/s.*



*Figure S3: Stability test result of Q2 electrode for 3000 GCD cycles.*



*Figure S4: First 6 GCD cycles of stability test for real device.*



*Figure S5: Last 6 GCD cycles of stability test for real device.*