

2D Materials Integrated Macroporous Electrodes for Li-Ion Battery

*Hemtej Gullapalli**, *Kaushik Kalaga*, *Soumya Vinod*, *Marco-Tulio F. Rodrigues*, *Antony George†* and *Pulickel M. Ajayan*

Department of Materials Science and Nano Engineering, Rice University, Houston, TX, USA

Supporting Information

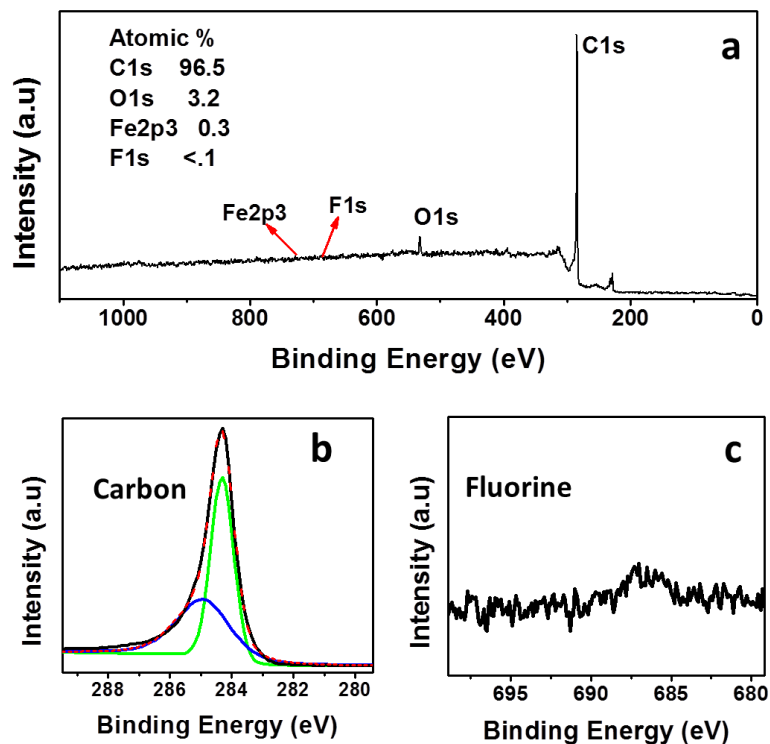


Figure S1: X-ray photoelectron spectroscopy (XPS) profile of graphene covered 3D stainless steel. (a) Survey analysis revealing a strong presence of carbon on the surface, the intensities of iron peak is also low due to the presence of high quality few layer graphene on the surface. (b) Elemental mapping of carbon, the peak can be deconvoluted into two constituents corresponding to sp² and sp³ carbons (c) Elemental mapping of fluorine, no substantial presence was observed

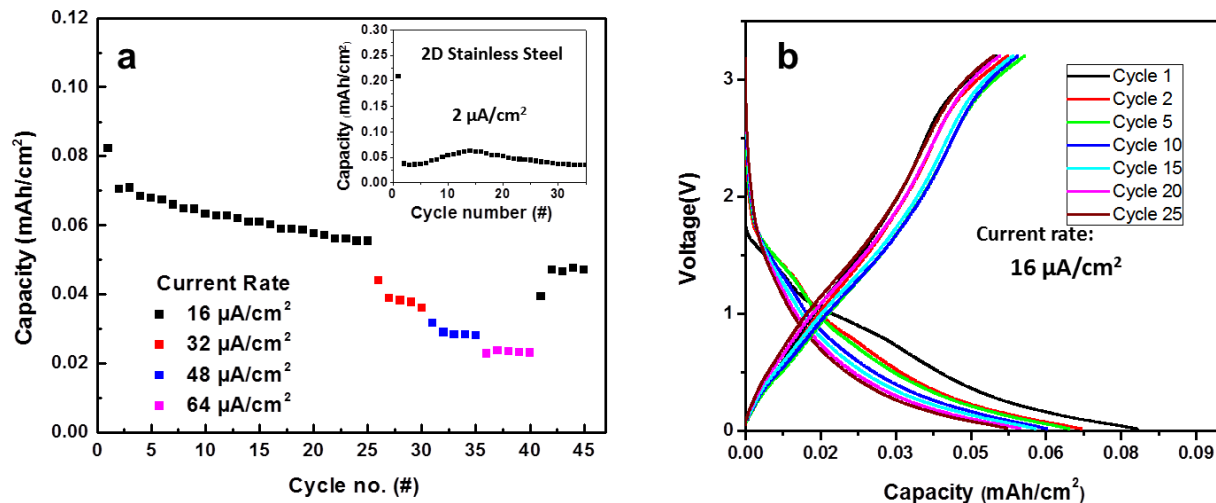


Figure S2: (a) rate capability study of porous graphene- on stainless steel used as an electrode in a lithium ion battery. Inset is the rate capability study of 2D graphene on Stainless steel. The 3D architecture delivered higher areal capacity compared to that of 2D architecture even at an 8-fold higher current rate. (b) Charge and discharge profiles of the cycled electrodes depicting the typical profile of carbon anodes.

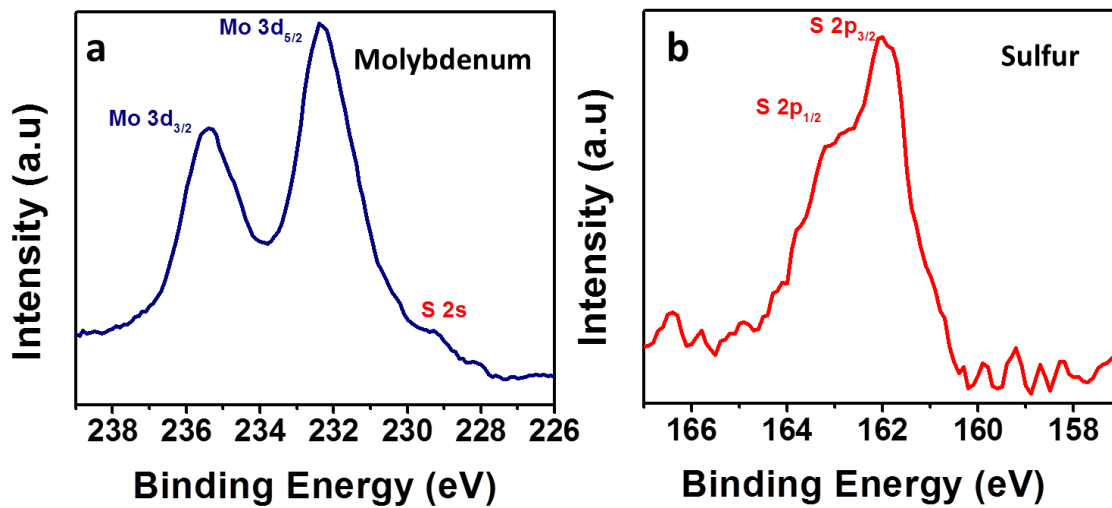


Figure S3: X-ray photoelectron spectroscopy (XPS) analyses of MoS₂ (a) Elemental analysis of Molybdenum (b) Elemental analysis of Sulfur