

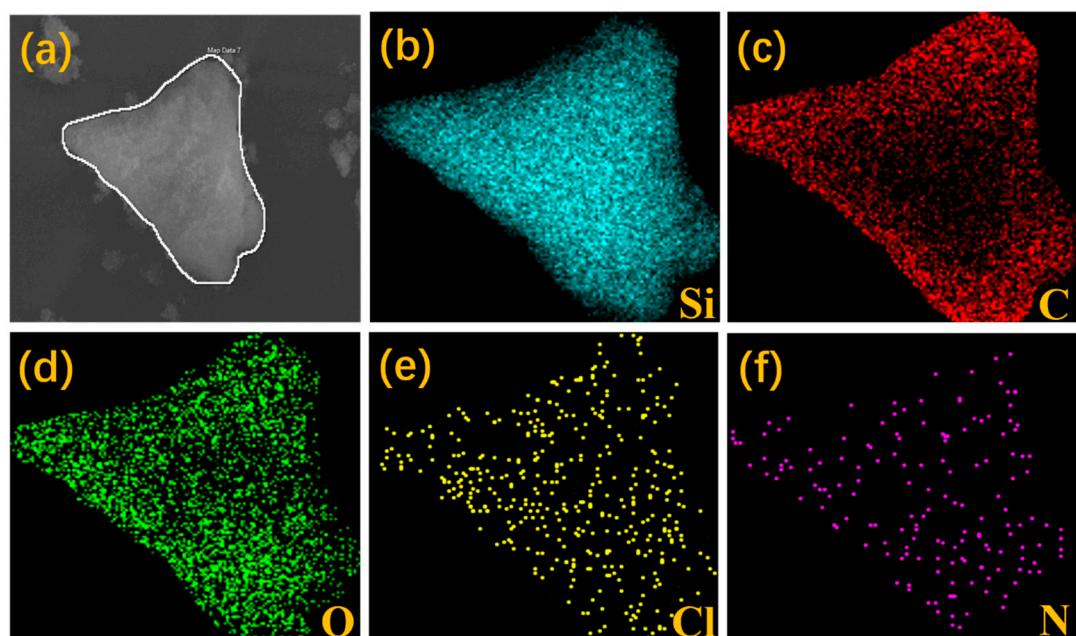
# Dual Carbonaceous Materials Synergetic Protection Silicon as a High-Performance Free-Standing Anode for Lithium-Ion Battery

Xing Li <sup>1,\*</sup>, Yongshun Bai <sup>1</sup>, Mingshan Wang <sup>1,\*</sup>, Guoliang Wang <sup>1</sup>, Yan Ma <sup>1</sup>, Yun Huang <sup>1</sup> and Jianming Zheng <sup>2,\*</sup>

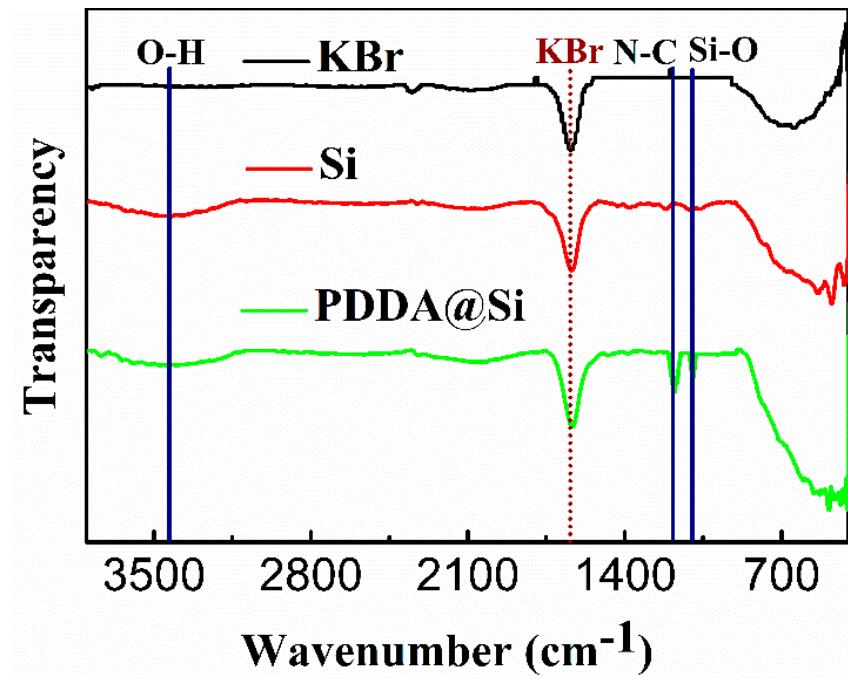
<sup>1</sup> The Center of New Energy Materials and Technology, School of Materials Science and Engineering, Southwest Petroleum University, Chengdu 610500, Sichuan, China; bysdyr@163.com (Y.B.); wangguoliang1012@163.com (G.W.); mayanlouis@163.com (Y.M.); huangyun982@163.com (Y.H.)

<sup>2</sup> Research Institute (RI), NingDe Amperex Technology Limited, Ningde 352100, Fujian, China

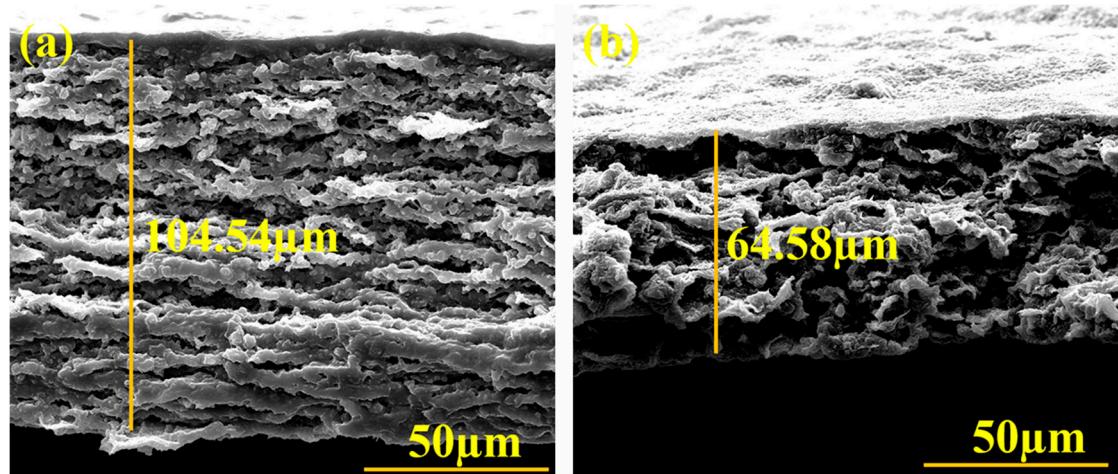
\* Correspondence: lixing198141@yahoo.com (X.L.); ustbwangmingshan@163.com (M.W.); xmzhjm@126.com (J.Z.)



**Figure S1** (a) The SEM image of PDDA@Si, (b-f) The EDS mapping of Si, C, O, Cl, N elements on the surface of PDDA@Si.



**Figure S2** Fourier transform infrared (FTIR) spectra of KBr, Si and PDDA@Si.



**Figure S3** SEM images of Si/rGO (a) and C@Si/rGO (b) film electrode after 30 cycles in the lithiated state.