Supporting Information

High-Performance Graphene/Sulphur Electrodes for Flexible Li-Ion Batteries Using Low-Temperature Spraying Method

Pushpendra Kumar[1,2], Feng-Yu Wu[3], Lung-Hao Hu[4], Sayed Ali Abbas[2], Jun Ming[3], Chia-Nan Lin[5], Jason Fang[5], Chih-Wei Chu[2*], Lain-Jong Li[3*]

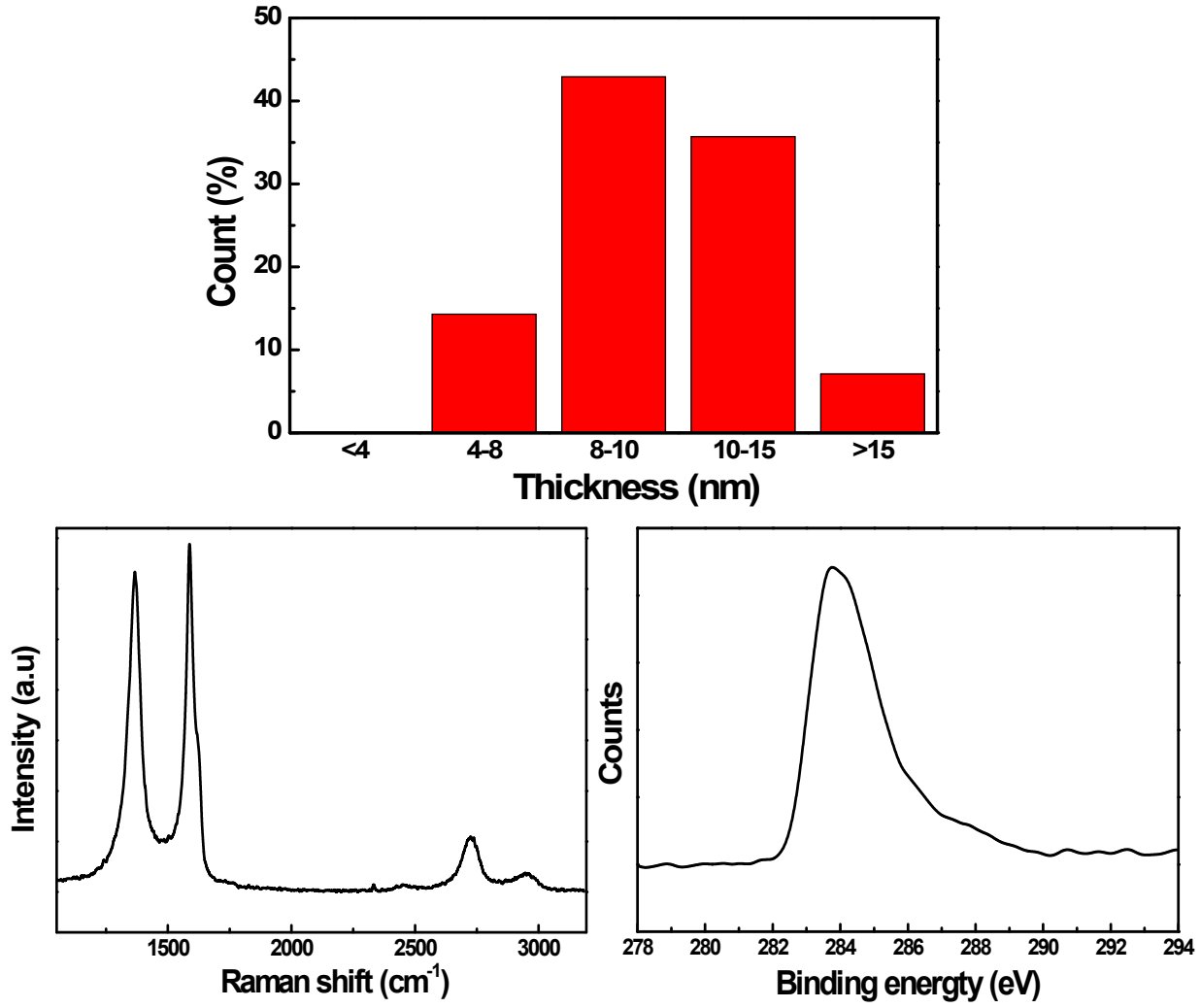

Figure S1. The thickness distribution for the graphene flake samples obtained, where theirthickness is from 4 nm to 15 nm. Selected Raman and X-ray photoemission spectroscopy (XPS) results for these flakes are also shown.

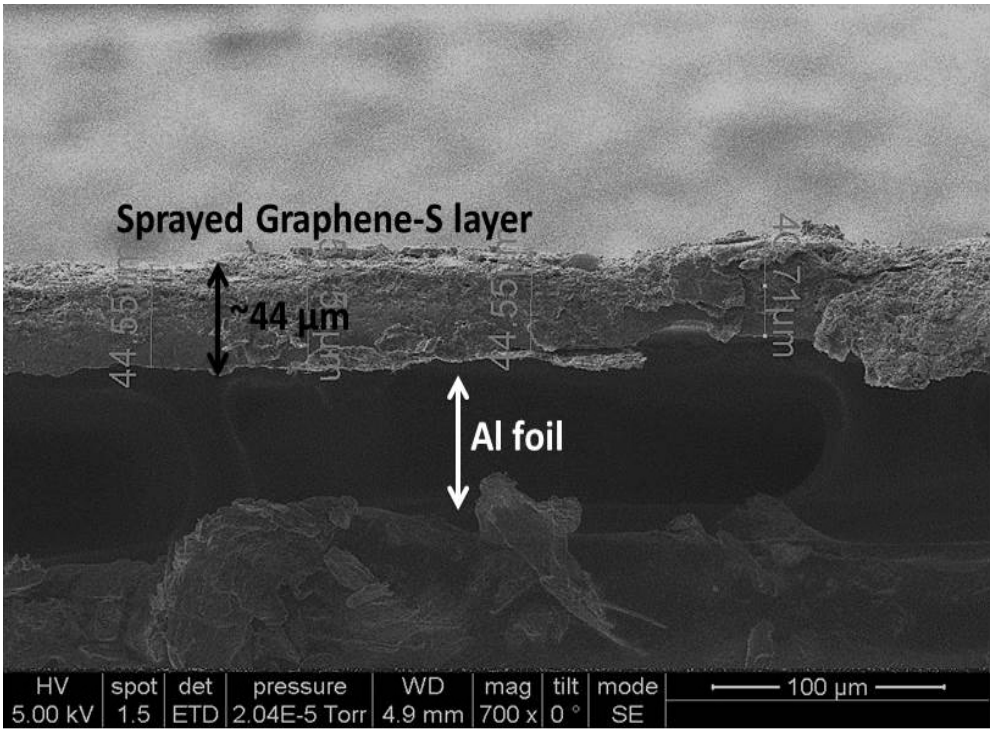

Figure S2. SEM images of the thickness distribution for the graphene-S composite sprayed over Al foil. The average thickness is ~45 µm.

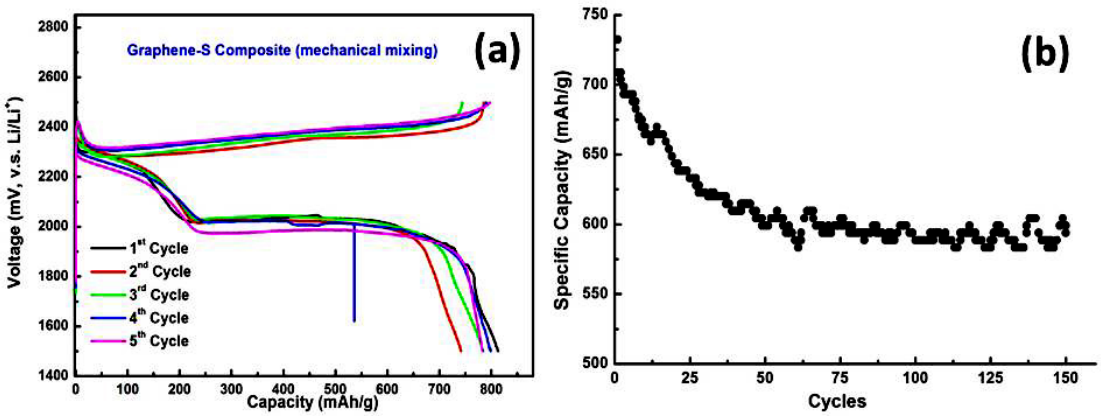

Figure S3. (a) Charge/discharge response and **(b)** Cycling response of the sprayed Graphene -S composite system prepared through mechanical mixing (Graphene : S = 20:80).

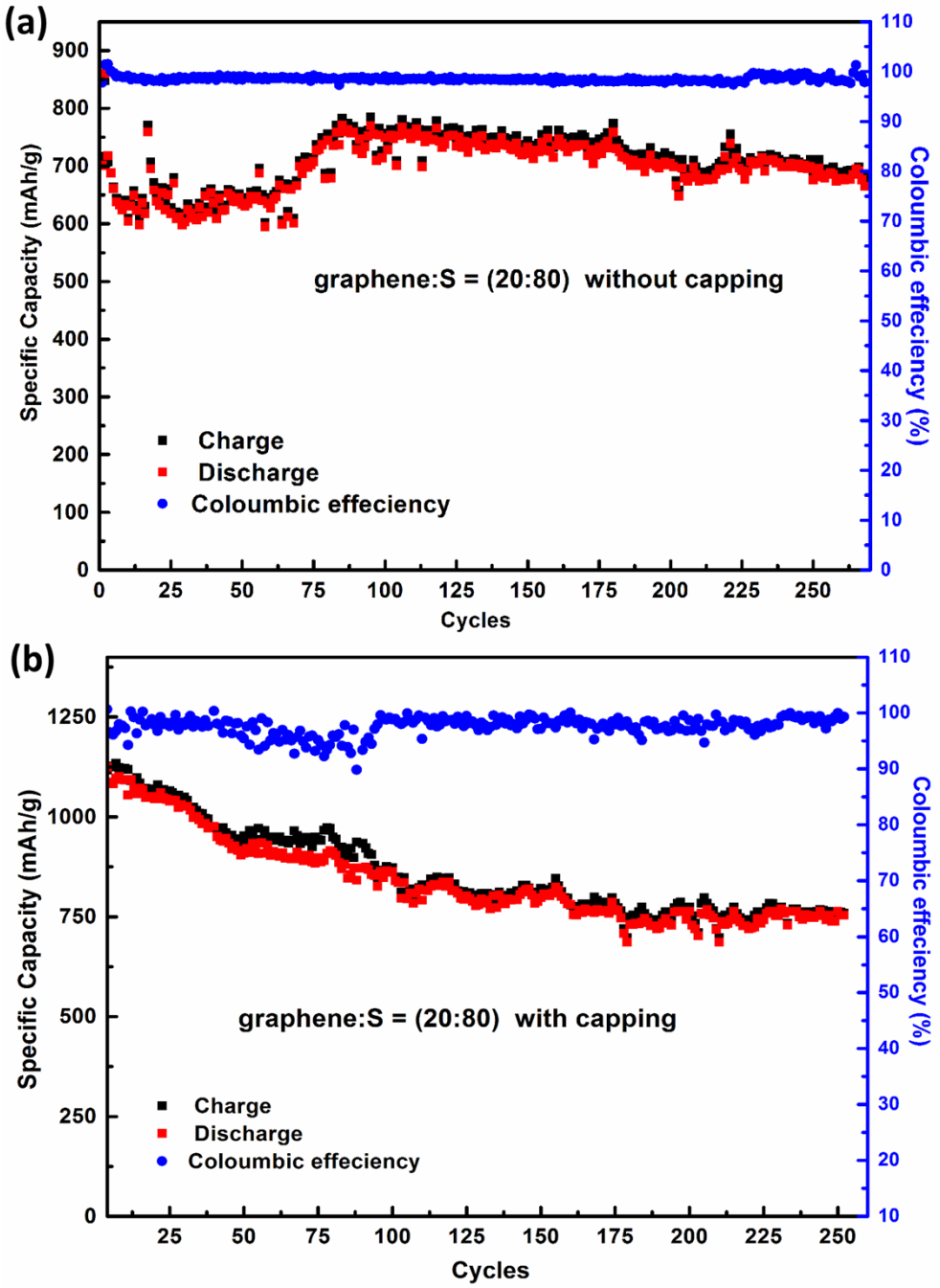

Figure S4. The charge/discharge Coulombic efficiency for the cells based on the electrodes graphene:S= 20:80 (a) without and (b) with a graphene capping layer is around 98% in the cycle test.

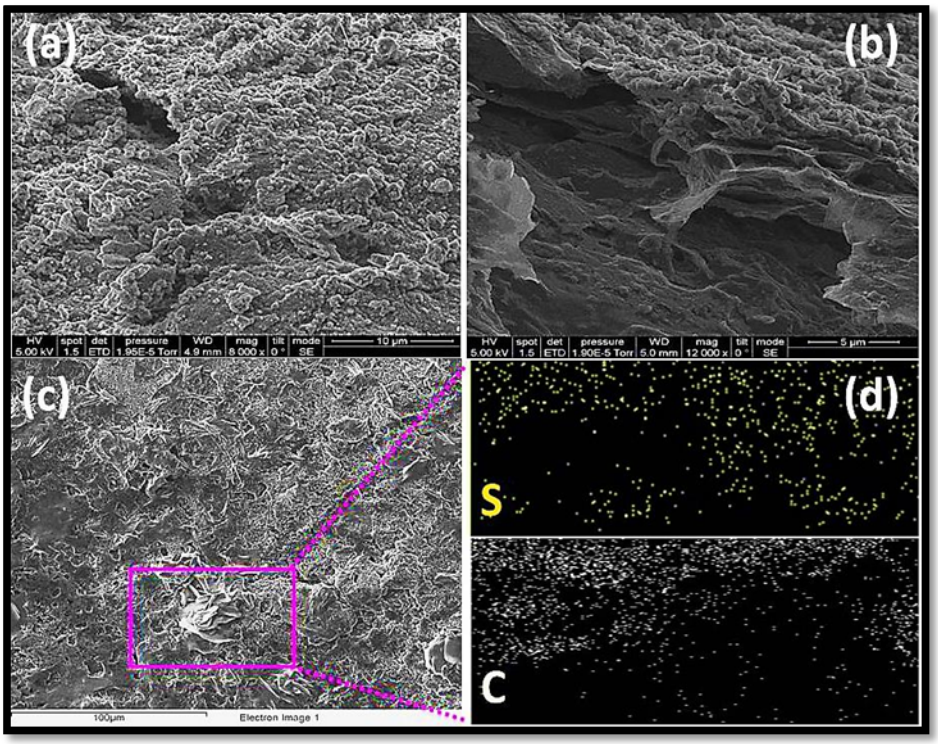

Figure S5. (a-b) Scanning electron microscopy images (top view) of the sprayed graphene-S composite after cycling. **(c-d)** EDS mapping confirm the uniform distribution of S even after cycling over the sprayed Graphene-S electrode.

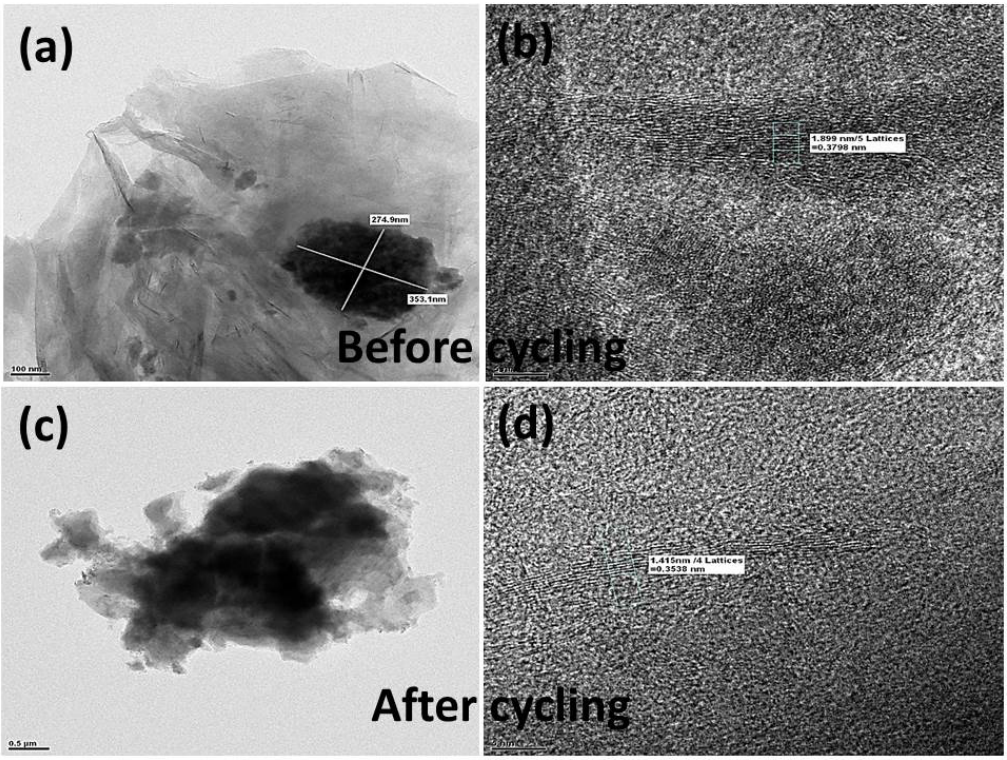

Figure S6. Transmission electron microscopy (TEM) images of the sprayed graphene-S electrode composite before and after cycling.

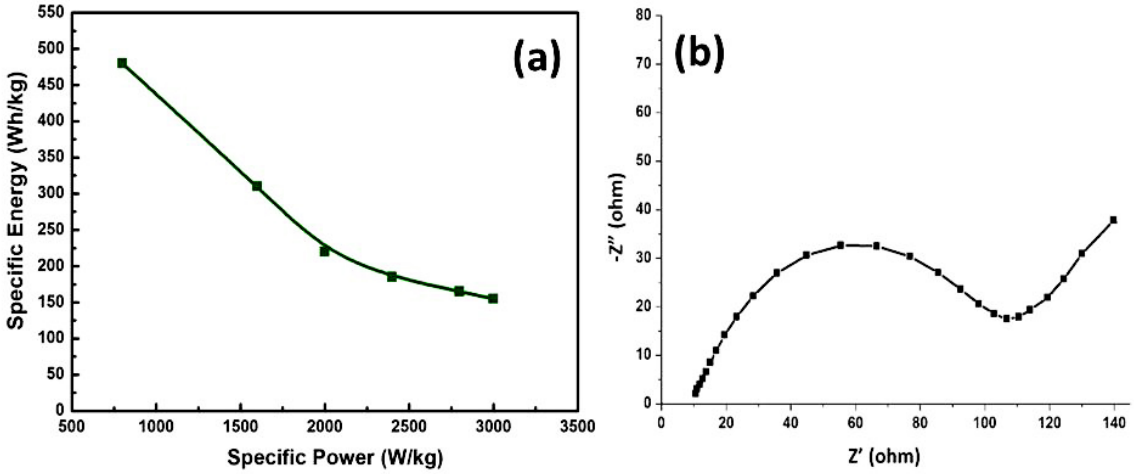

Figure S7. (a) Ragone plot at different charge/discharge voltages for the battery made from (Graphene : S = 20:80). (b) Nyquist plot for the sprayed Gr-S cathode before cycling from 10 kHz to 10 mHz at room temperature (Graphene : S = 20:80).