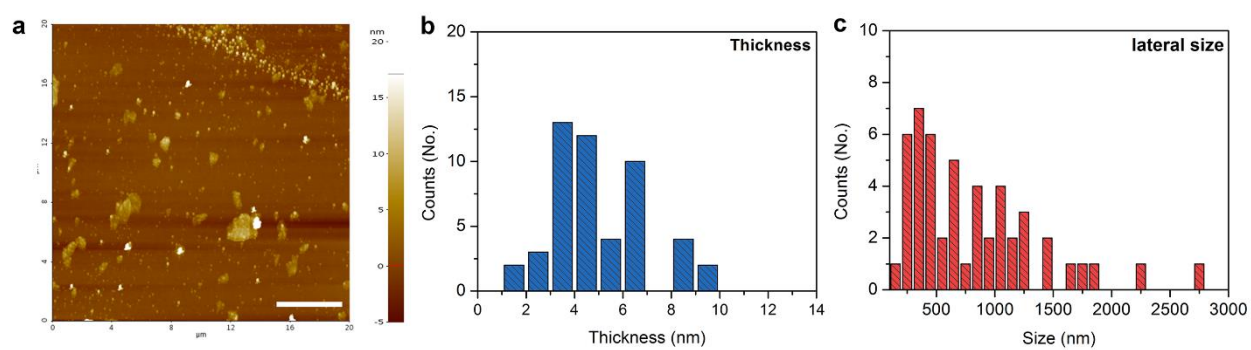


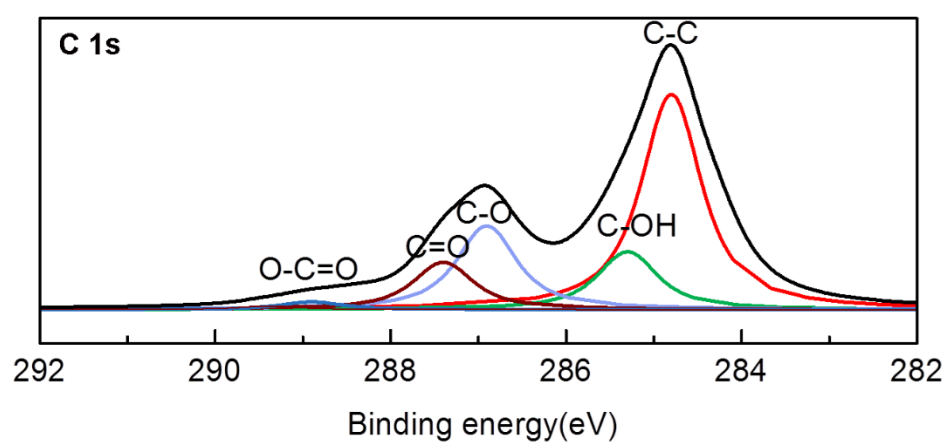
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*Supplementary Material*

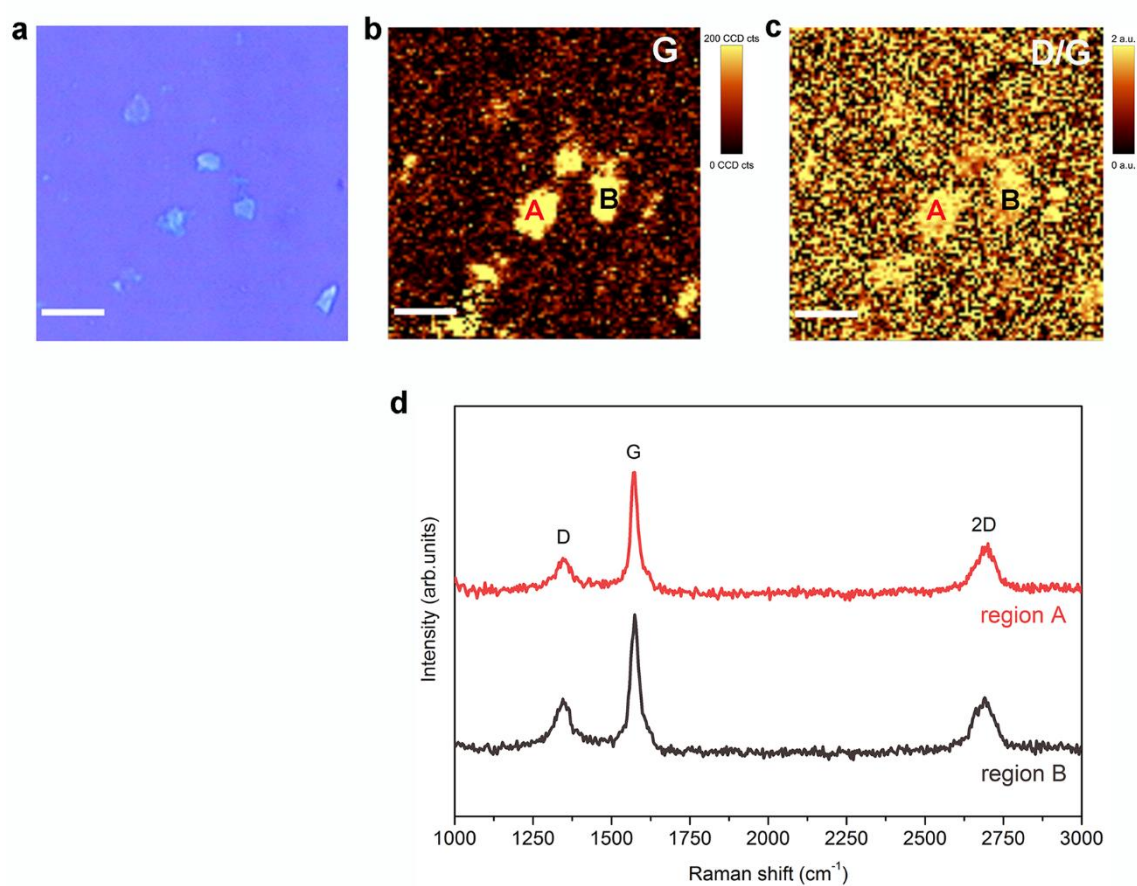
# **Graphene/PVDF Composites for Ni-rich Oxide Cathodes Toward High-Energy Density Li-ion Batteries**



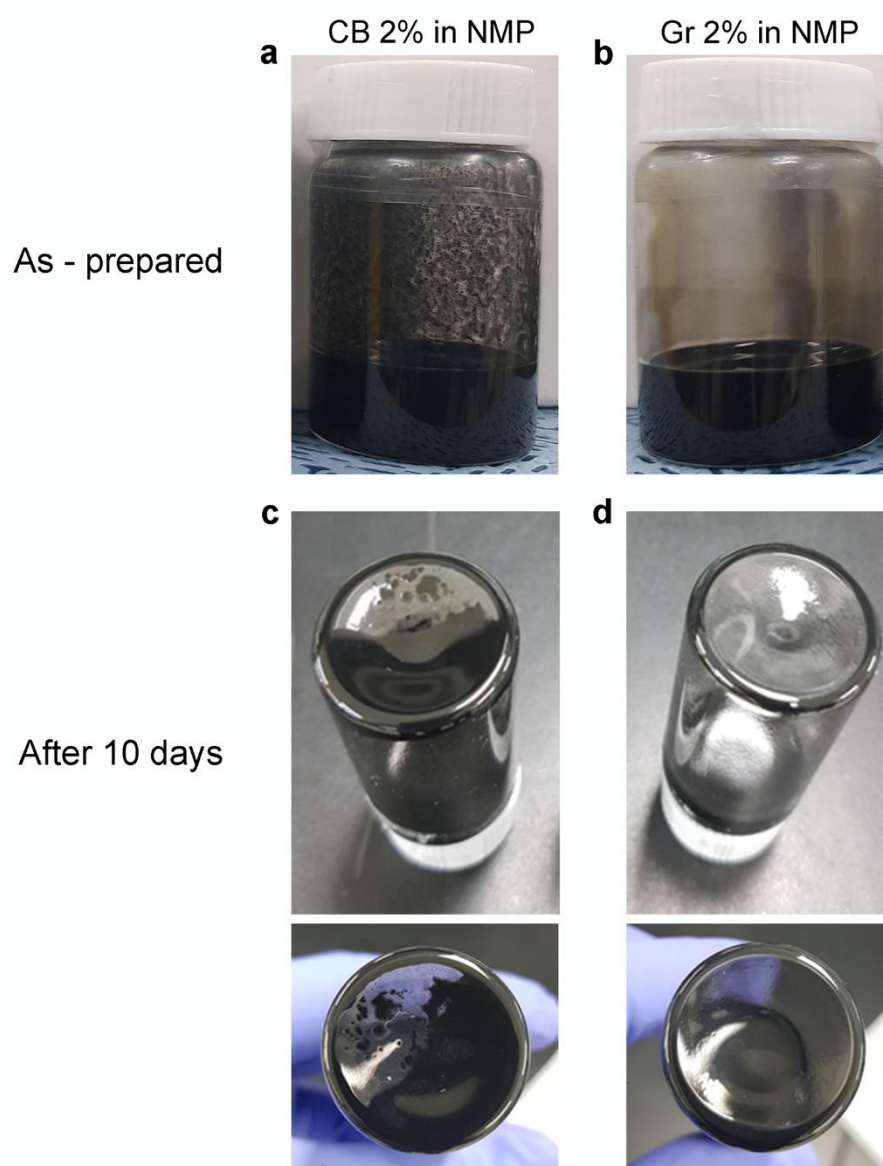
**Figure S1.** (a) AFM images with a scan area of  $20 \times 20 \mu\text{m}^2$  and (b) thickness- and (c) lateral size-distributions of electrochemically exfoliated Gr sheets. Scale bar in a, 5  $\mu\text{m}$ .



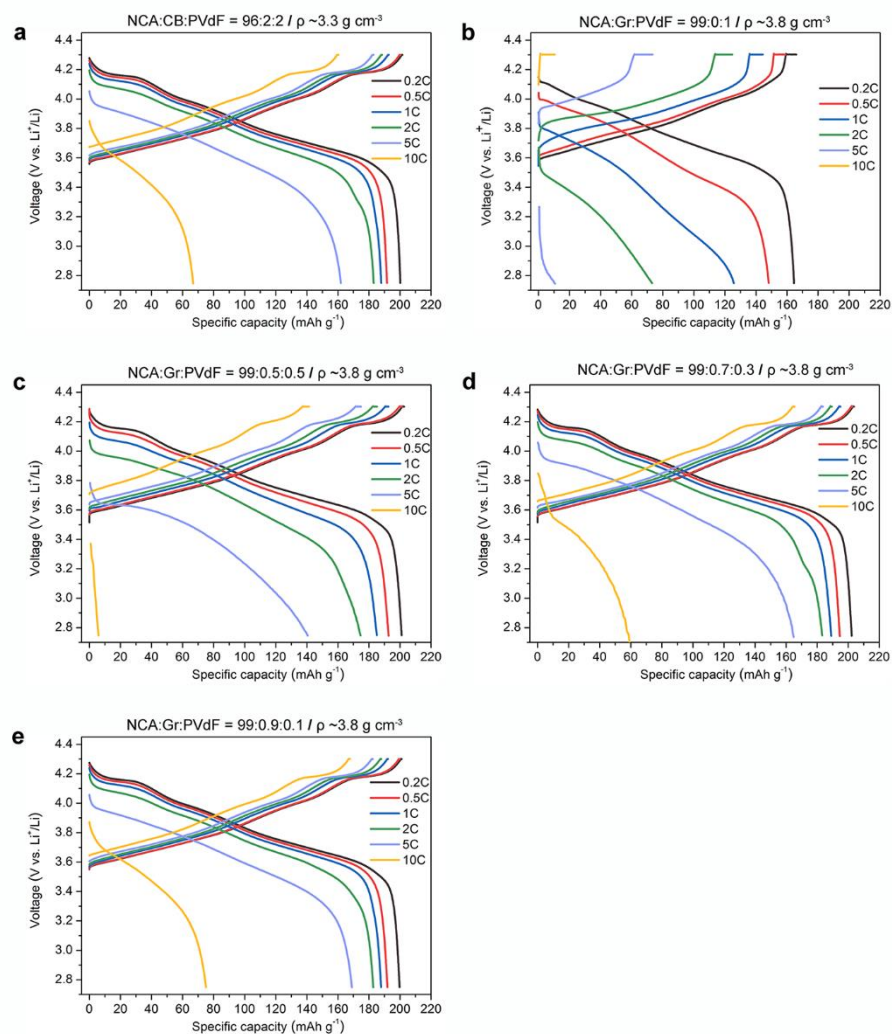
**Figure S2.** XPS C 1s spectra of as-exfoliated Gr nanosheets.



**Figure S3.** (a) Optical image; (b,c) Raman mapping images; and (d) Raman spectra of the corresponding regions on as-exfoliated Gr nanosheets. The Raman mapping images show contrasts of the G band (b) and D/G bands (c). All of the scale bars indicate 10  $\mu\text{m}$ .



**Figure S4.** Digital photographs of (a,c) CB and (b,d) Gr dispersions (2 wt% in NMP) before and after 10 days.



**Figure S5.** Voltage profiles of NCA electrodes with different electrode compositions and electrode densities (a–e), measured in the voltage range of 2.75–4.3 V vs.  $\text{Li}^+/\text{Li}$  at 0.2–10C and 30 °C.

