

Supporting Information

Figure S1 shows the intact sheet architecture after fluorination for $\text{CF}_{0.89}$ material. Figure S2 clearly indicates that $\text{CF}_{0.89}$ is a white powder but the color turns black with decreased fluorine content indicating improved conductivity. Figure S3 shows the TEM images of $\text{CF}_{0.66}$ and $\text{CF}_{0.89}$ samples after the first discharge cycle. The red circles indicate the LiF domains formed during the discharge process.

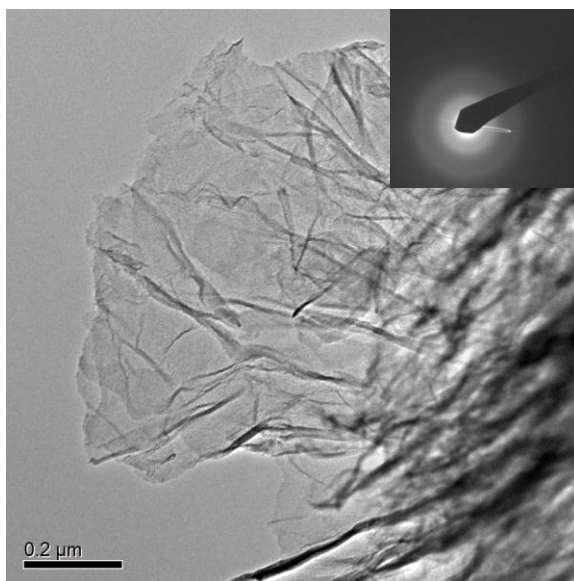


Figure S1: TEM image of as synthesized $\text{CF}_{0.89}$ material indicating sheet architecture.



Figure S2: Picture indicating the color darkening with decreased fluorine content for fluorinated graphene.

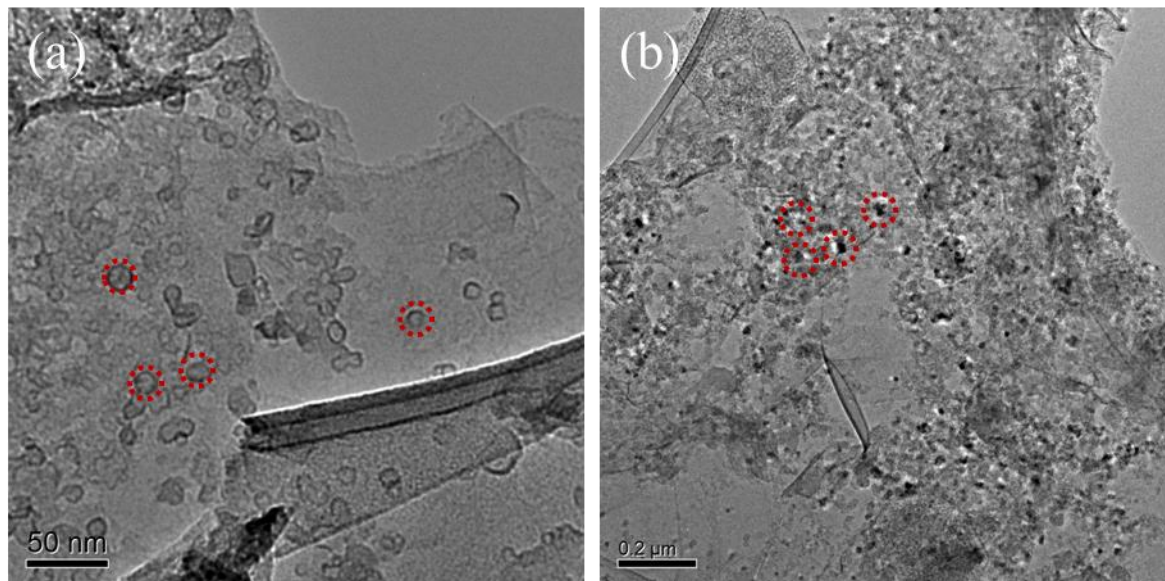


Figure S3: TEM image of $\text{CF}_{0.66}$ and $\text{CF}_{0.89}$ material after the discharge cycle indicating crystalline domains of LiF (red circles).