

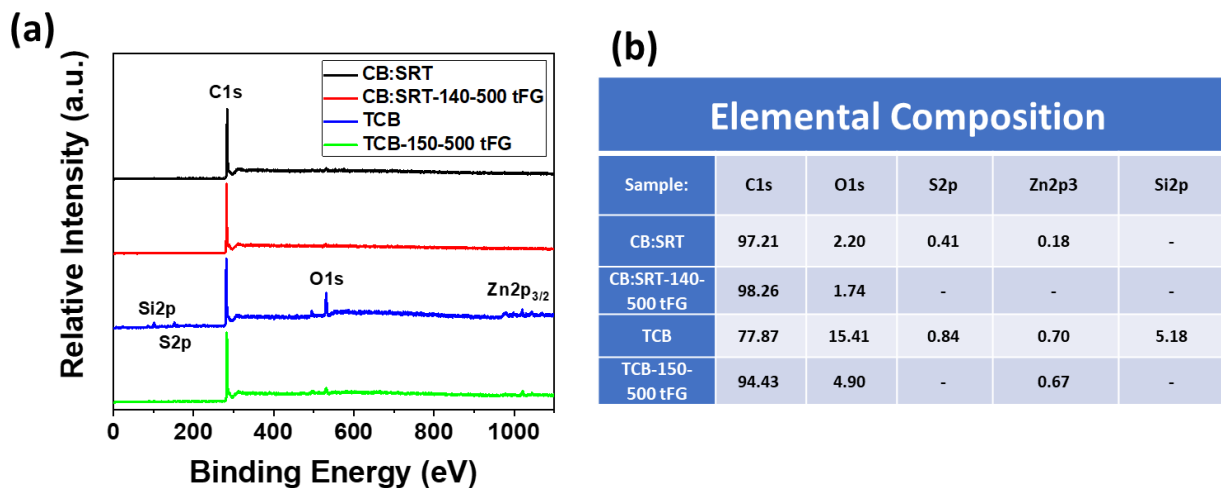
## Supporting Information

### Flash Graphene from Rubber Waste

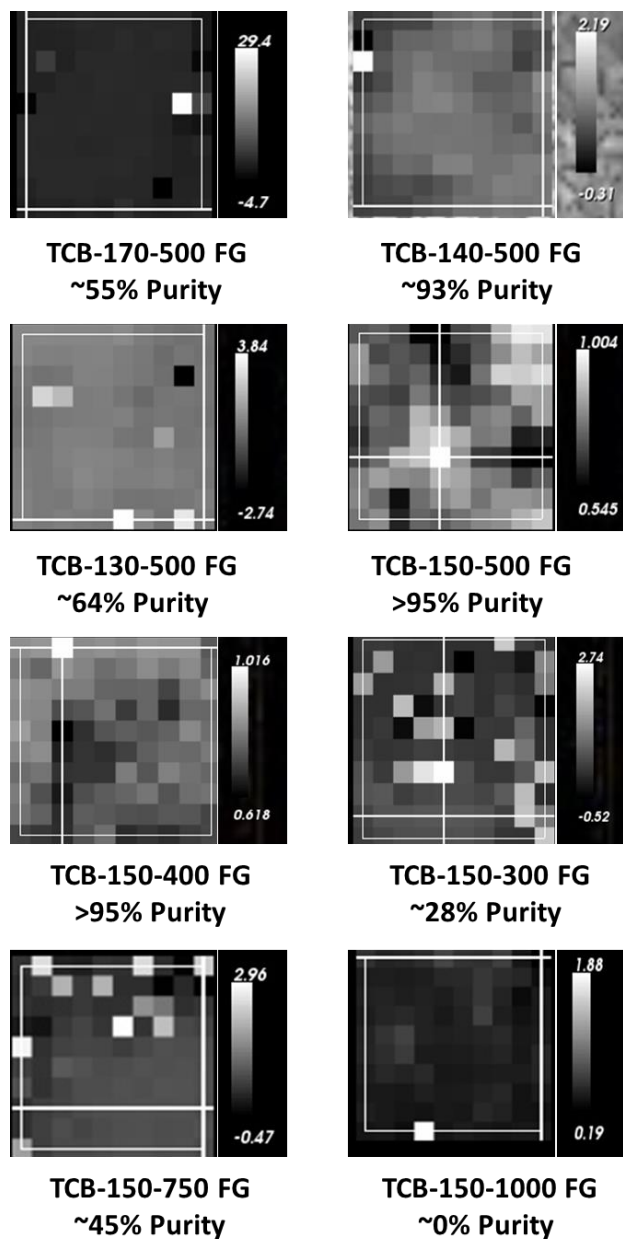
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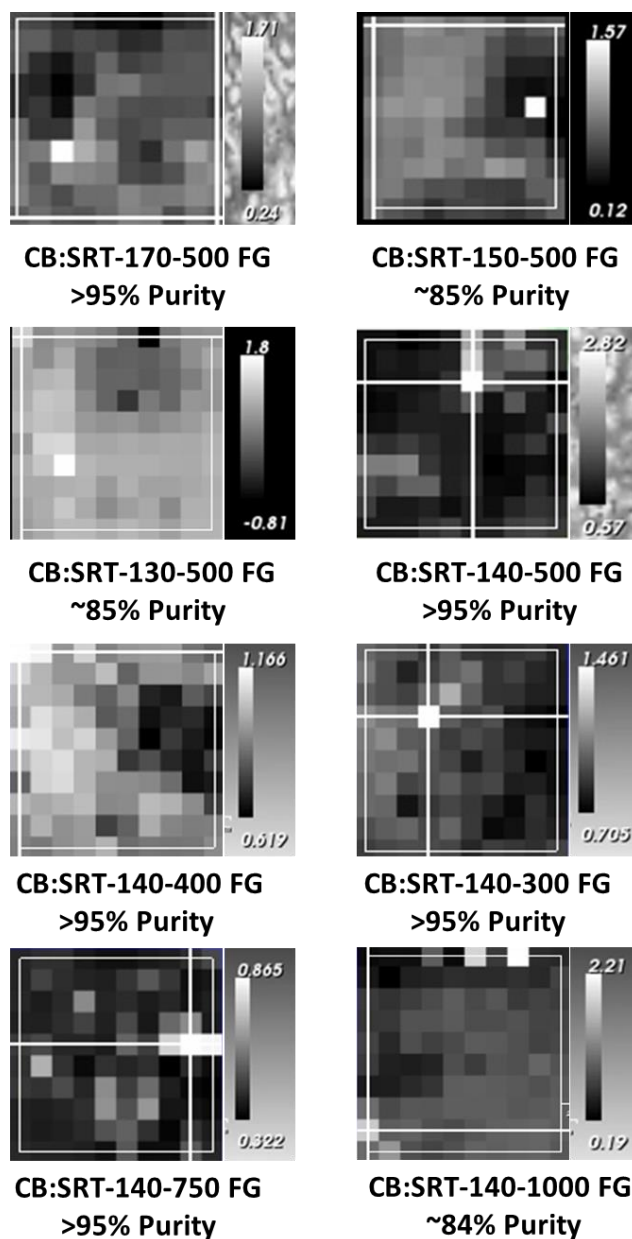
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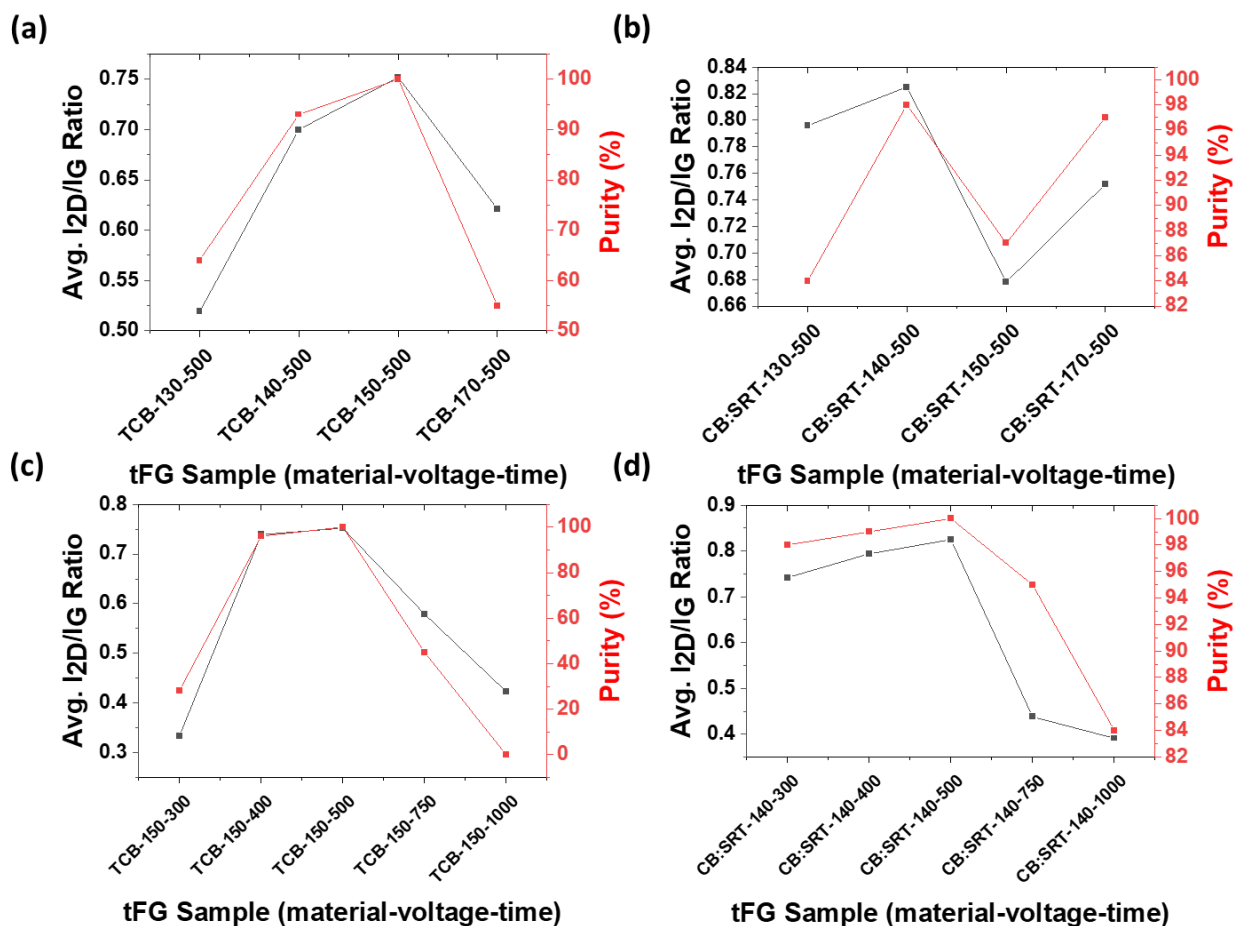
**Figure S1.** (a) XPS patterns of CB:SRT, TCB, and tFG derivatives and (b) elemental composition of each sample.



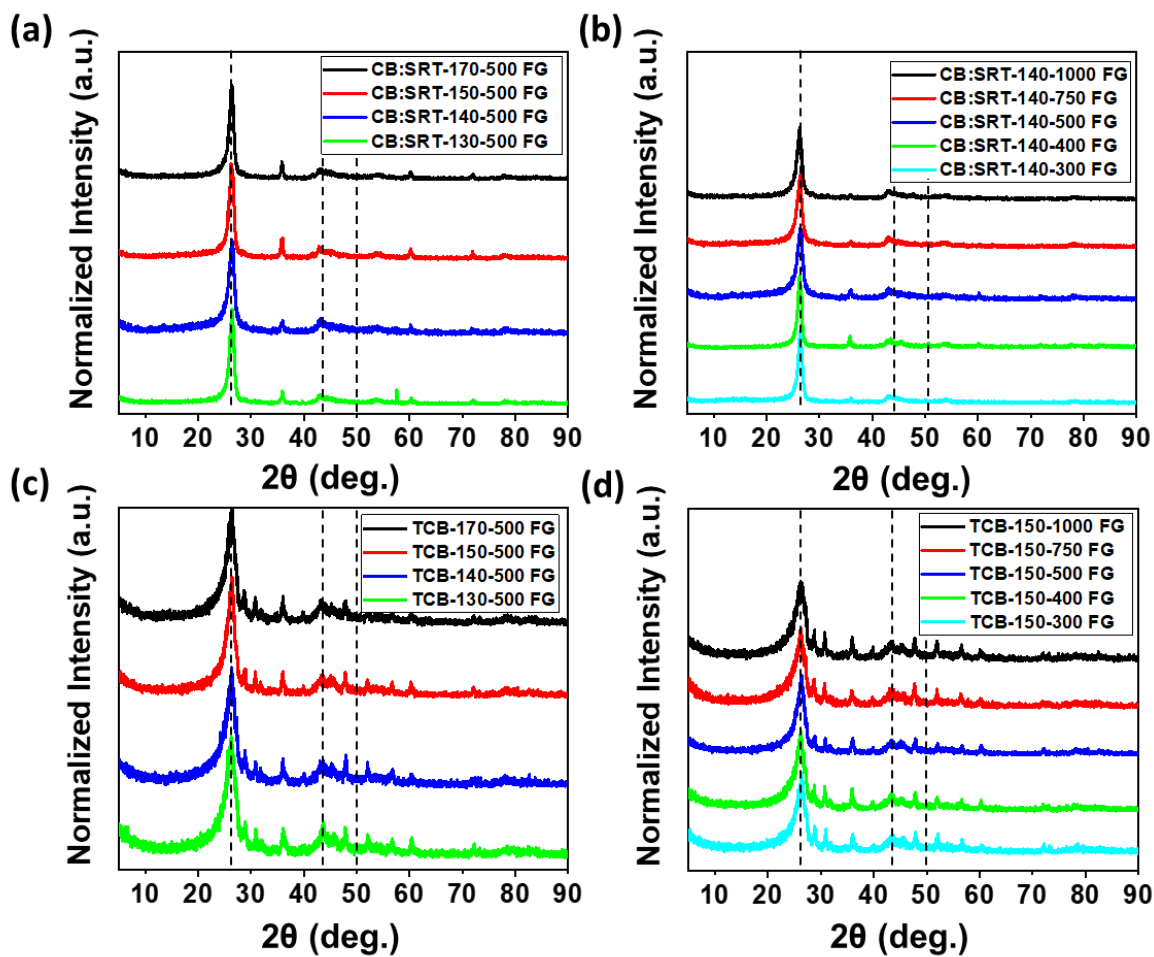
**Figure S2.** Raman mapping of TCB tFG using Raman spectroscopy. Each square is 1  $\mu\text{m}$  x 1  $\mu\text{m}$ , with the grayscale value corresponding to the  $I_{2D}/I_G$  ratio at that particular spot. Purity refers to the percentage of sampled areas that showed an  $I_{2D}/I_G$  ratio  $>0.5$ . For some samples, the lack of a sufficiently intense 2D peak results in skewed values for the mapping, leading to negative or extremely high values. This occurs most often in mapping of samples with low conversion or excess conversion to graphite.



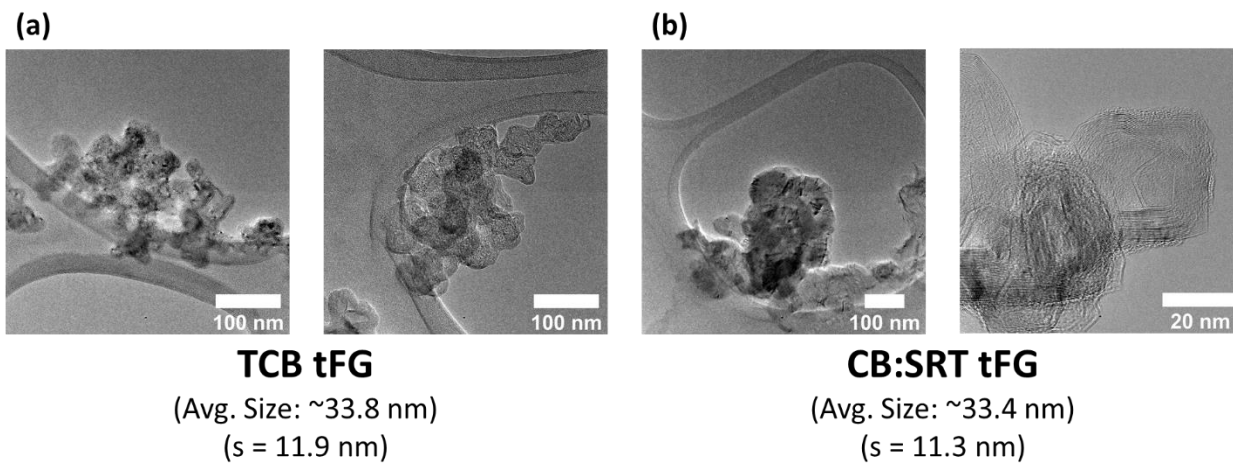
**Figure S3.** Raman mapping of TCB tFG using Raman spectroscopy. Each square is  $1 \mu\text{m} \times 1 \mu\text{m}$ , with the grayscale value corresponding to the  $I_{2D}/I_G$  ratio at that particular spot. Purity refers to the percentage of sampled areas that showed an  $I_{2D}/I_G$  ratio  $>0.5$ . For some samples, the lack of a sufficiently intense 2D peak results in skewed values for the mapping, leading to negative or extremely high values. This occurs most often in mapping of samples with low conversion or excess conversion to graphite.



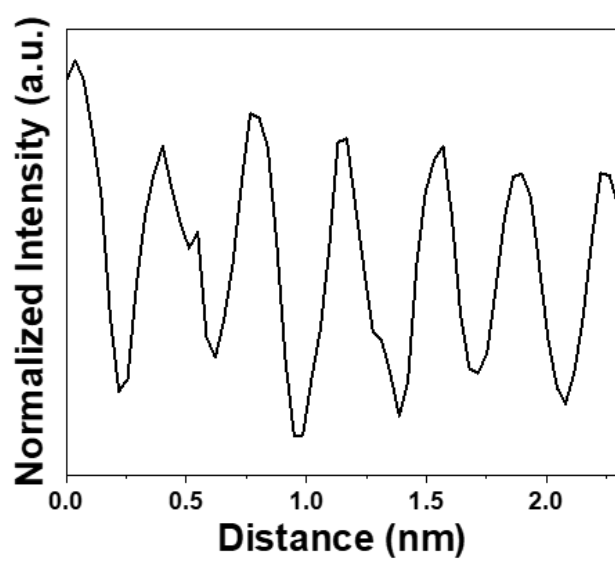
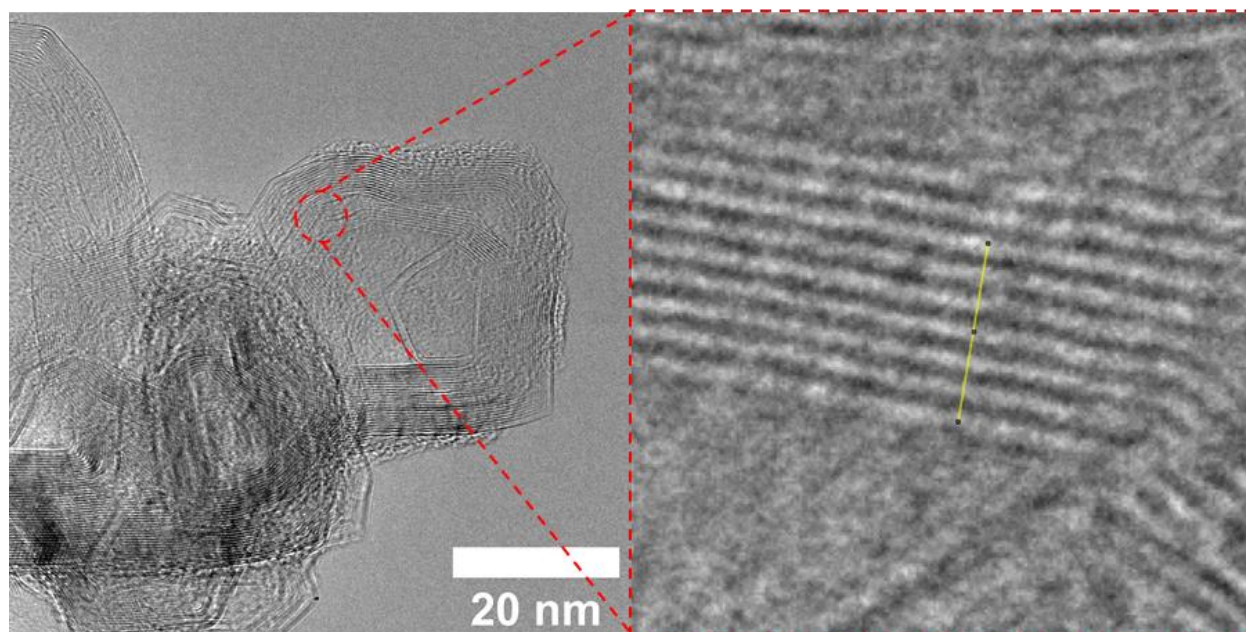
**Figure S4.** Average I2D/IG ratio and percentage of feedstock converted to graphene (purity) for (a) TCB and (b) CB:SRT tFG with varying pulse voltages, as well as (c) TCB and (d) CB:SRT tFG with varying pulse times. On the x-axis, the label format “Sample-X-Y” is used for each sample of tFG, where “Sample” is the carbon feedstock, X is the pulse voltage in V, and Y is the pulse time in ms. Average I2D/IG ratio was calculated by determining the I2D/IG ratio of 100 different Raman spectra and averaging the resulting values. Purity refers to the percentage of sampled areas that showed an I2D/IG ratio >0.5.



**Figure S5.** XRD patterns of CB:SRT tFG with varying (a) pulse voltages and (b) pulse times. XRD patterns of TCB tFG with varying (c) pulse voltages and (d) pulse times.

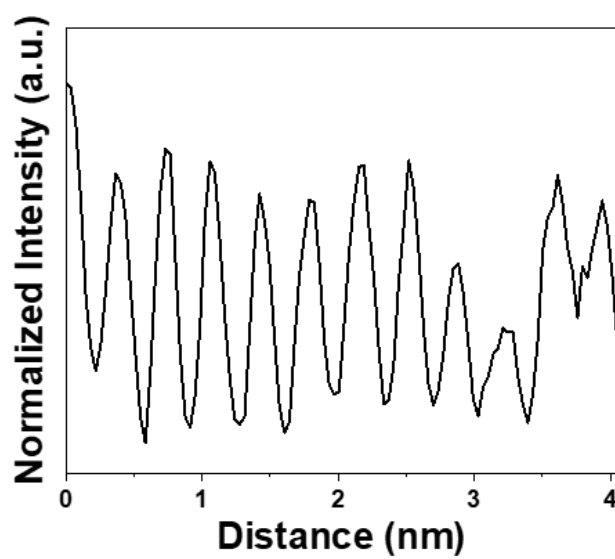
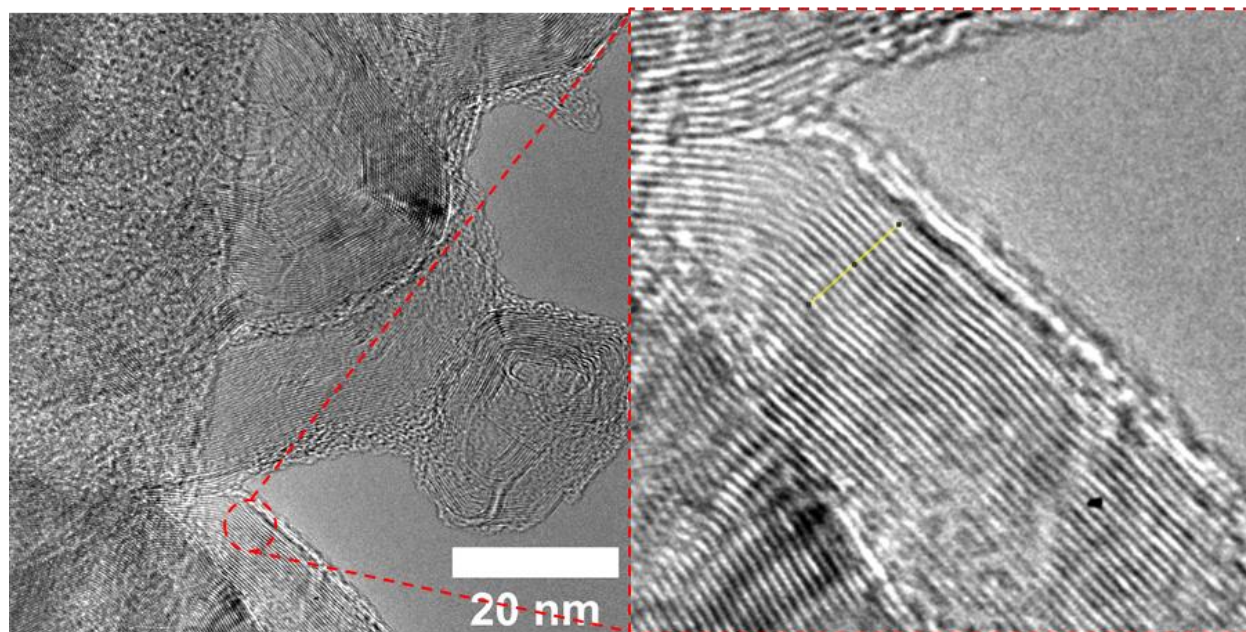


**Figure S6.** TEM images of (a) TCB-150-500 tFG and (b) CB:SRT-140-500 tFG. The lateral size of the flakes was measured in these images for each distinct flake. Here, “s” is the standard deviation of the flake sizes for each sample



**Figure S7.** TEM images showing the interlayer spacing of CB:SRT-140-500 tFG.





**Figure S8.** TEM images showing the interlayer spacing of TCB-150-500 tFG.