Supporting Information

Heteroatom-doped Reduced Graphene Oxide/Polyaniline Nanocomposites with Improved n-type Thermoelectric Performance

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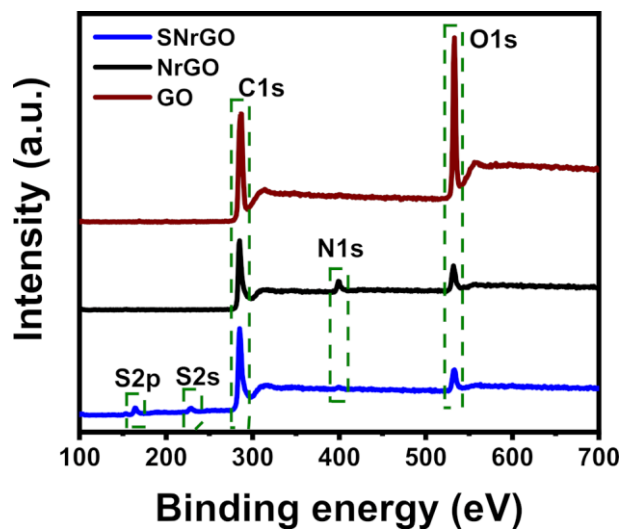
S1-XPS measurements

Figure S1: XPS wide survey spectra of GO, NrGO, and SNrGO

As seen in **Fig. S1,** GO spectrum had two peaks corresponding to C 1s and O 1s peaks. Doping was evidenced by the presence of additional nitrogen and both sulfur and nitrogen related peaks in the NrGO and SNrGO spectra respectively. NrGO had a significant amount of 8.5 % nitrogen while SNrGO consisted of 3.8 % nitrogen and 1.6 % of sulfur. Additionally, the C/O ratio for GO, NrGO and SNrGO was 2.49, 6.32 and 8.89 respectively. These results confirm the dual doping-reduction nature of the facile hydrothermal technique for graphene oxide.
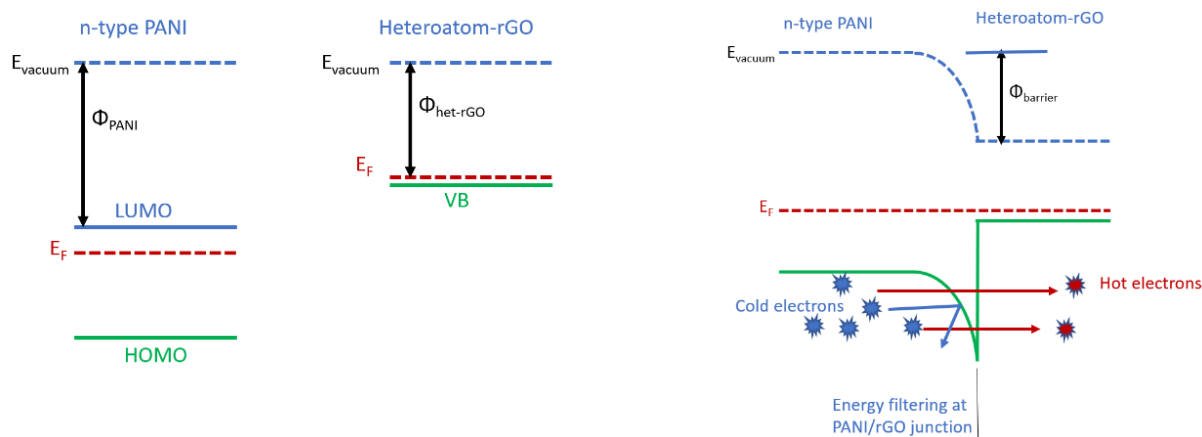
S2-Energy filtering Phenomena

Figure S2: Energy diagram showing (a) The proposed schematic of the energy filtering at PANI/rGO interface (not drawn to scale for simplicity), and (b) Energy filtering effect after band bending

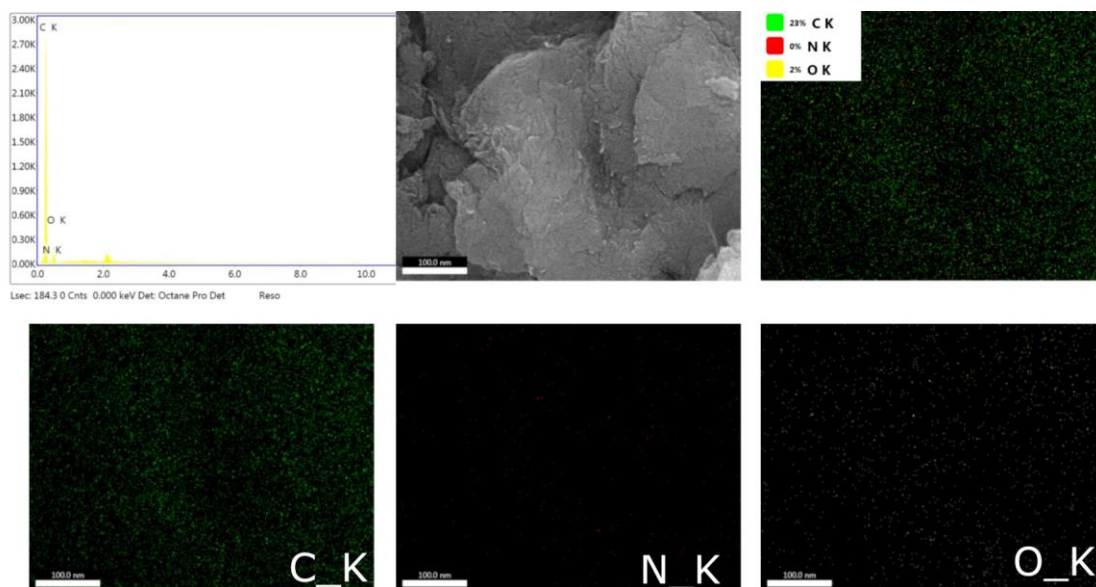## S3-EDX and mapping of doped rGO, PANI, and PANI composites

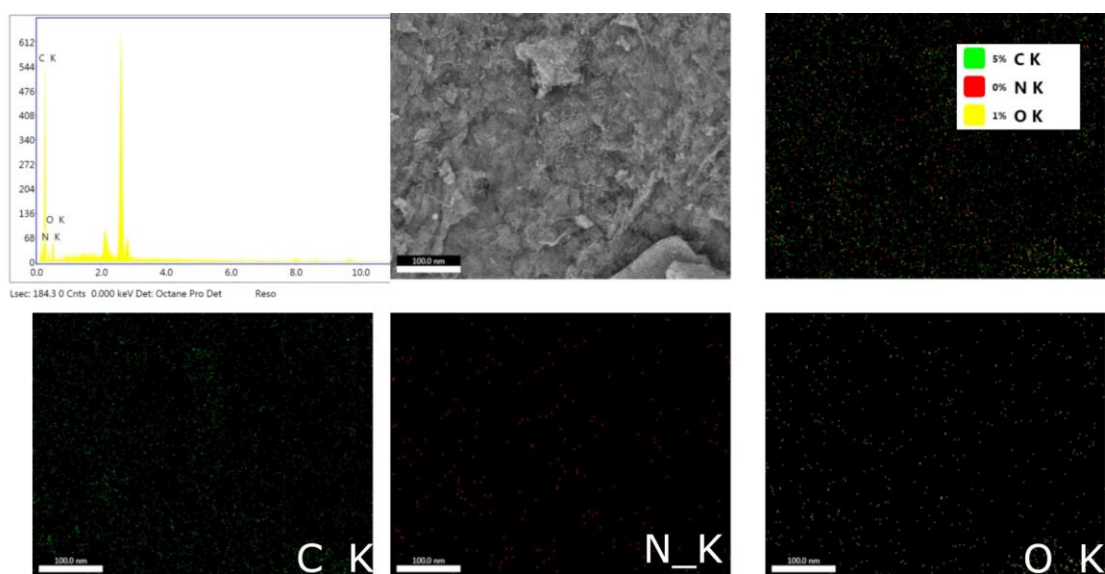Figure S3: EDX analysis and mapping data for NrGO sample

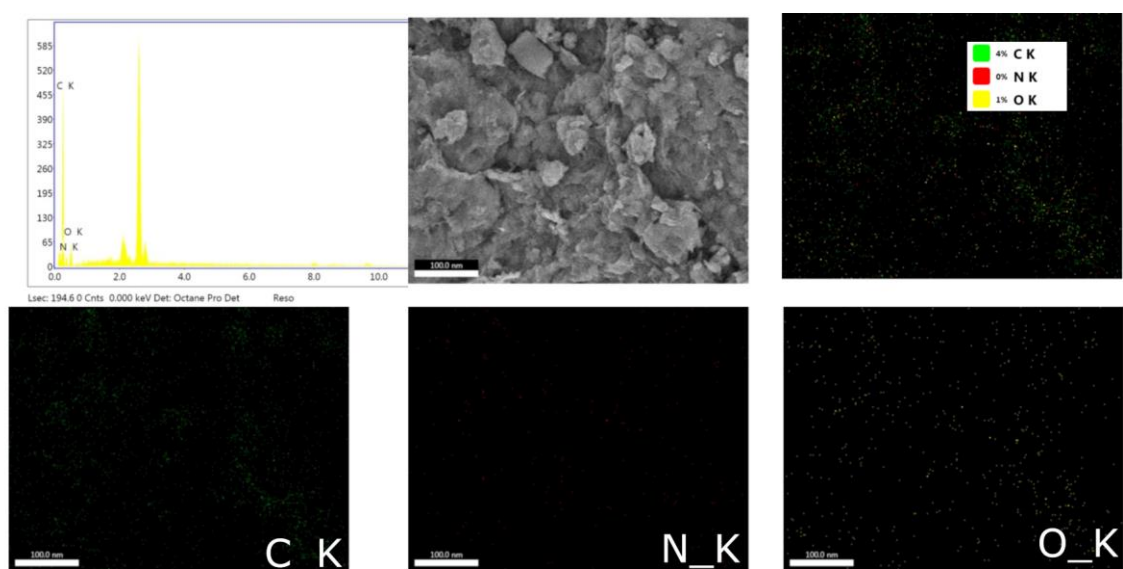Figure S4: EDX analysis and mapping data for polyaniline sample

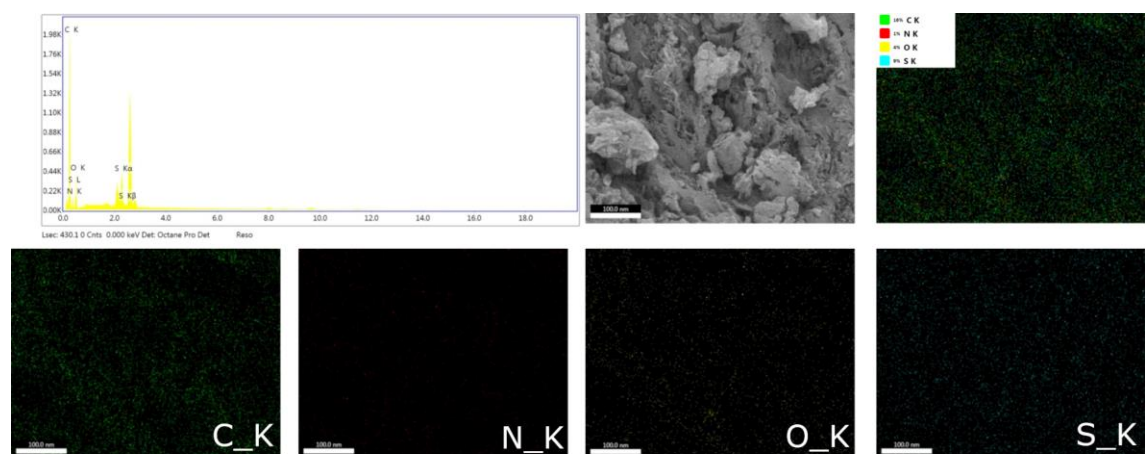Figure S5: EDX analysis and mapping data for PNrGO-1 sample

Figure S6: EDX analysis and mapping data for PSNrGO-1 sample
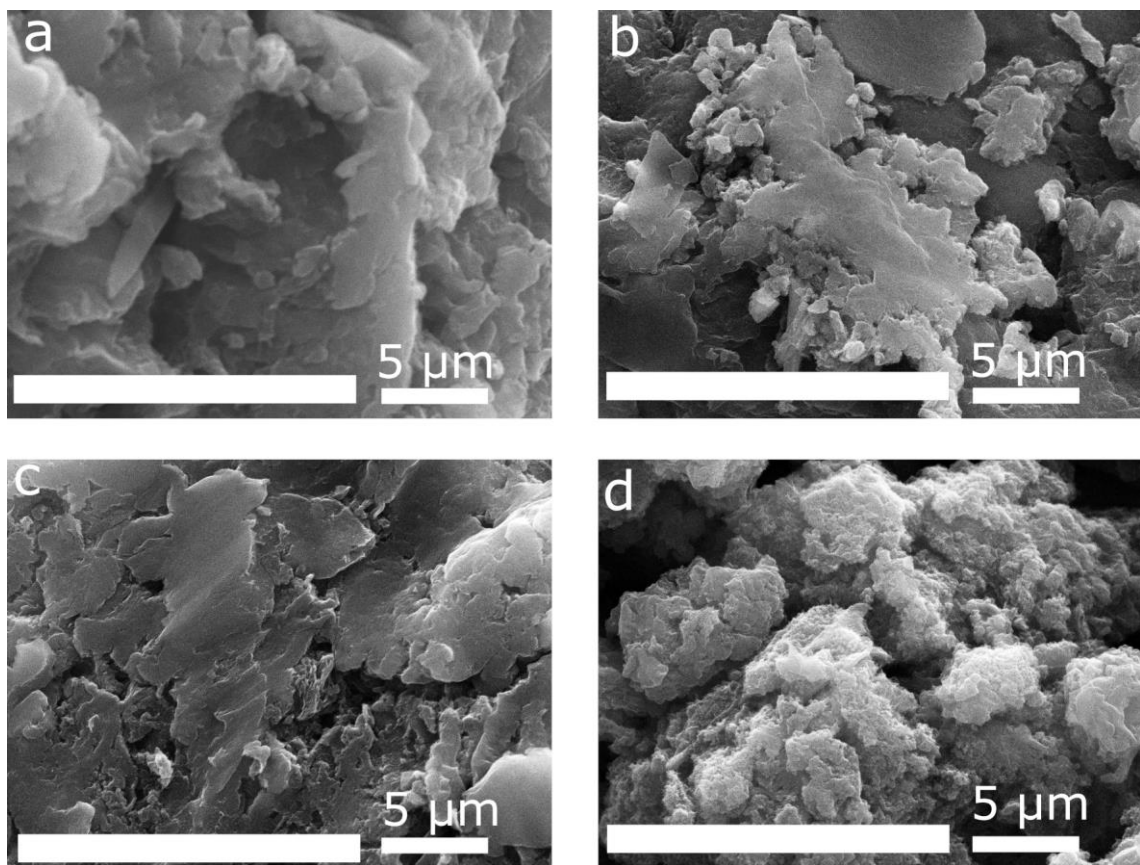
S4-SEM images of the PANI composites

Figure S7: SEM images of PNrGO-1 (a), PNrGO-5 (b), PSNrGO-1 (c), and PSNrGO-5 (d)