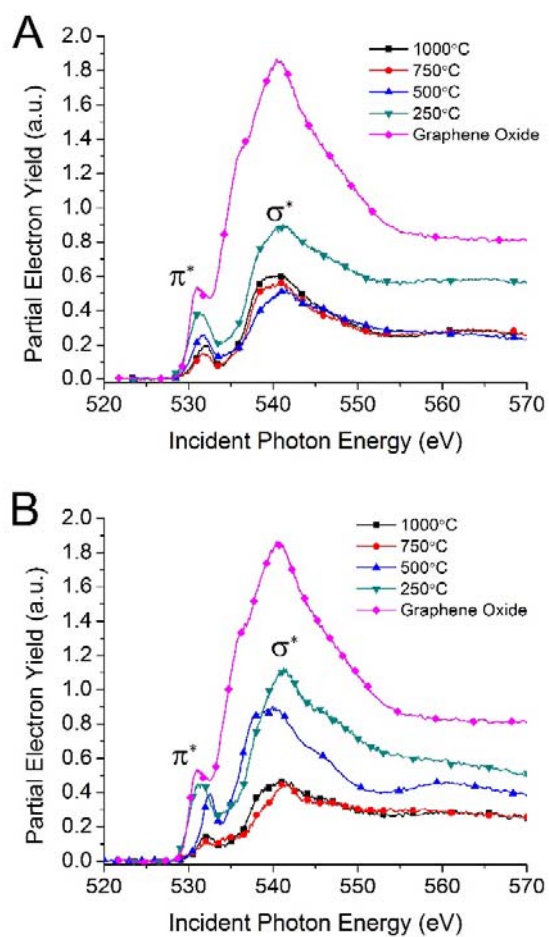
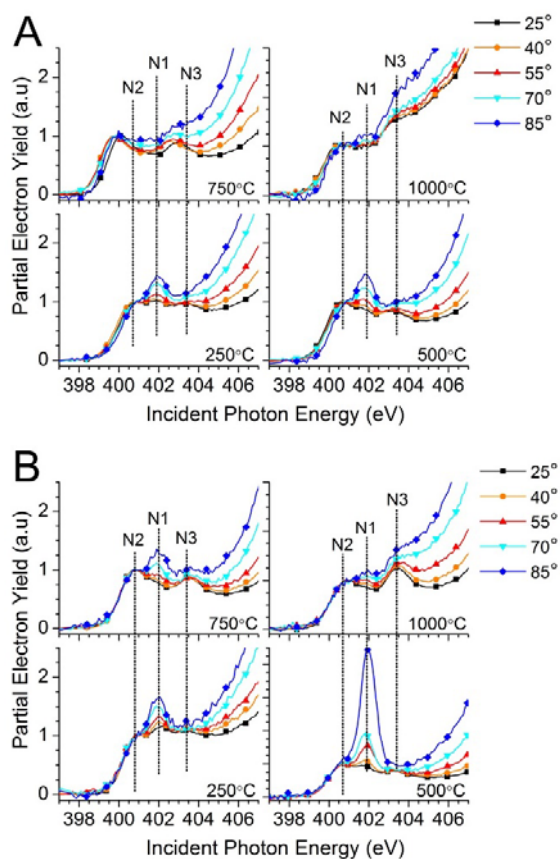


## Supporting Information



**Supporting Fig. S1** Oxygen K-edge NEXAFS spectra of graphene oxide and reduced graphene oxide samples. Samples were reduced under (A) ambient pressure or (B) low pressure. Spectra are pre-edge normalized only to enable evaluation of the relative oxygen content at 570 eV, beyond the  $\sigma^*$  feature.



**Supporting Fig. S2.** Nitrogen K-edge NEXAFS spectra of graphene oxide and nitrogen-incorporated reduced graphene oxide. The samples were reduced under (A) ambient pressure or (B) low pressure. (A) A magnified view of the energy region near the onset depicted in Figure 6A. (B) A magnified view of the energy region near the onset depicted in Figure 6C. The different spectral features have been normalized to the N2 peak clearly indicating the angular anisotropy of the N1 resonance, which shows maximum absorption at 85°, orthogonal to the N2 and N3 resonances.