Supporting Information

Chemistry of reduced graphene oxide: implications for the electrophysical properties of segregated graphene-polymer composites

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Section S1. Probing thermal stability of the derived N-doped reduced graphene oxides

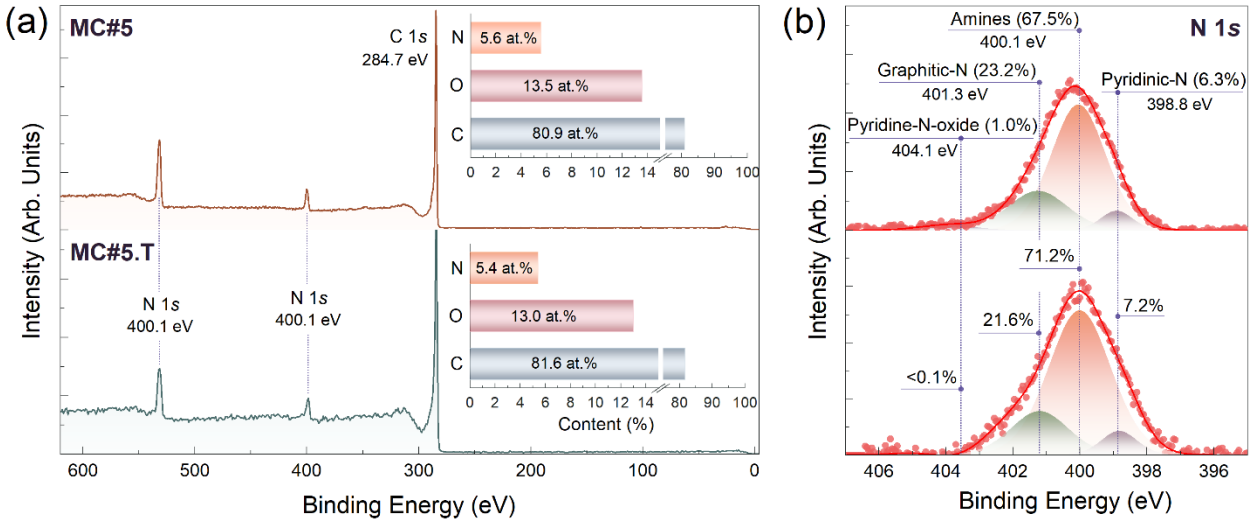


Figure S1. (a) Survey and (b) High-resolution N 1*s* XPS spectra of the MC#5 sample prior to (upper section) and after (bottom section) the annealing at 200 °C for 2 hours in air.

Section S2. XPS examination of the initial GO

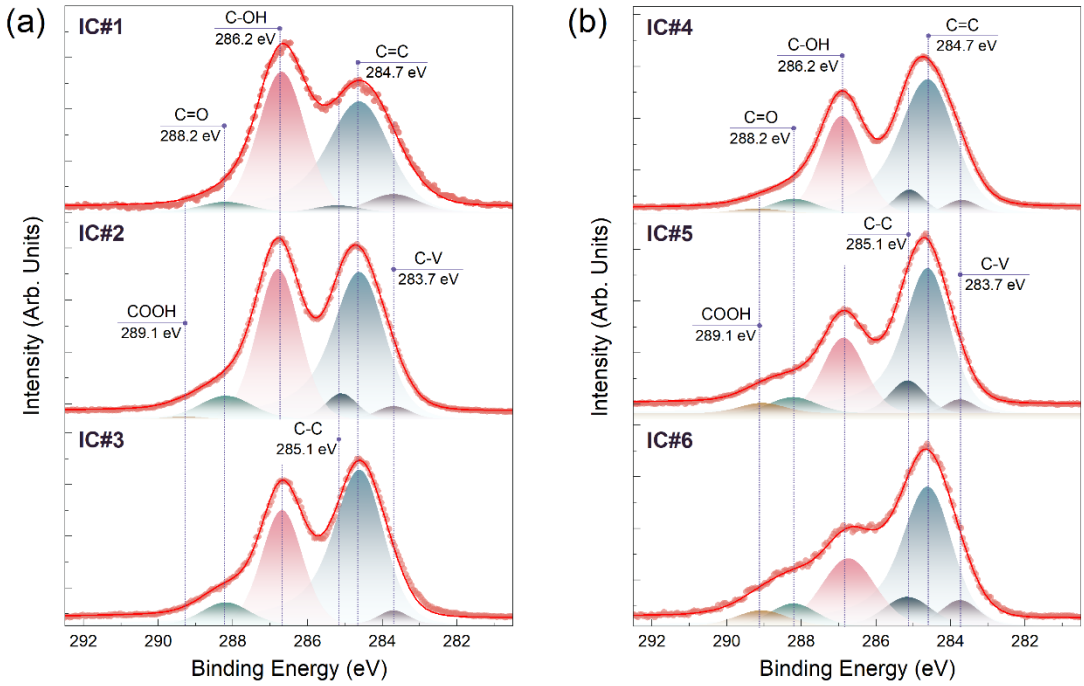


Figure S2. High-resolution C 1*s* XPS spectra of the initial GO (IC#1-IC#6) synthesized using mixtures of $KMnO_4$:$K_2Cr_2O_7$ with different ratios.

Table S1. The functional composition of the IC#1-IC#6 samples derived from the deconvoluted C 1*s* spectra displayed in Figure S1. The values are given in at.%

Component	C-V	C=C	C-C	C-OH & C-O-C	C=O	COOH	C/O Ratio
Binding Energy (eV)	283.7	284.7	285.1	286.2	288.2	289.0	
IC#1	5.8	47.7	2.0	41.0	3.5	<0.1	2.3
IC#2	2.6	49.9	4.6	35.4	6.9	0.6	2.3
IC#3	3.3	59.7	1.0	30.6	5.1	0.3	2.6
IC#4	3.0	57.9	4.9	27.8	4.7	1.7	2.8
IC#5	3.2	59.7	6.3	22.1	5.1	3.6	2.9
IC#6	6.4	53.6	8.6	20.3	6.2	4.9	2.6

Section S3. O 1*s* and N 1*s* spectra of the MC#1-MC#6 samples

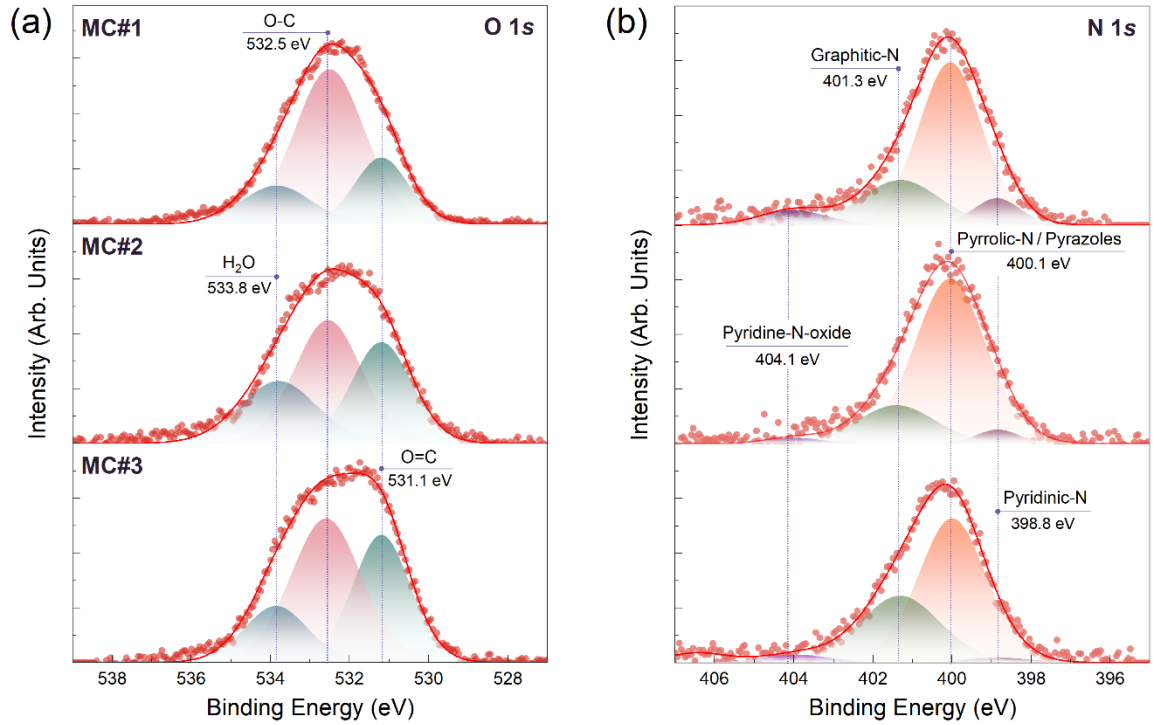


Figure S3. High-resolution (a) O 1*s* and (b) N 1*s* XPS spectra of the MC#1-MC#3 samples

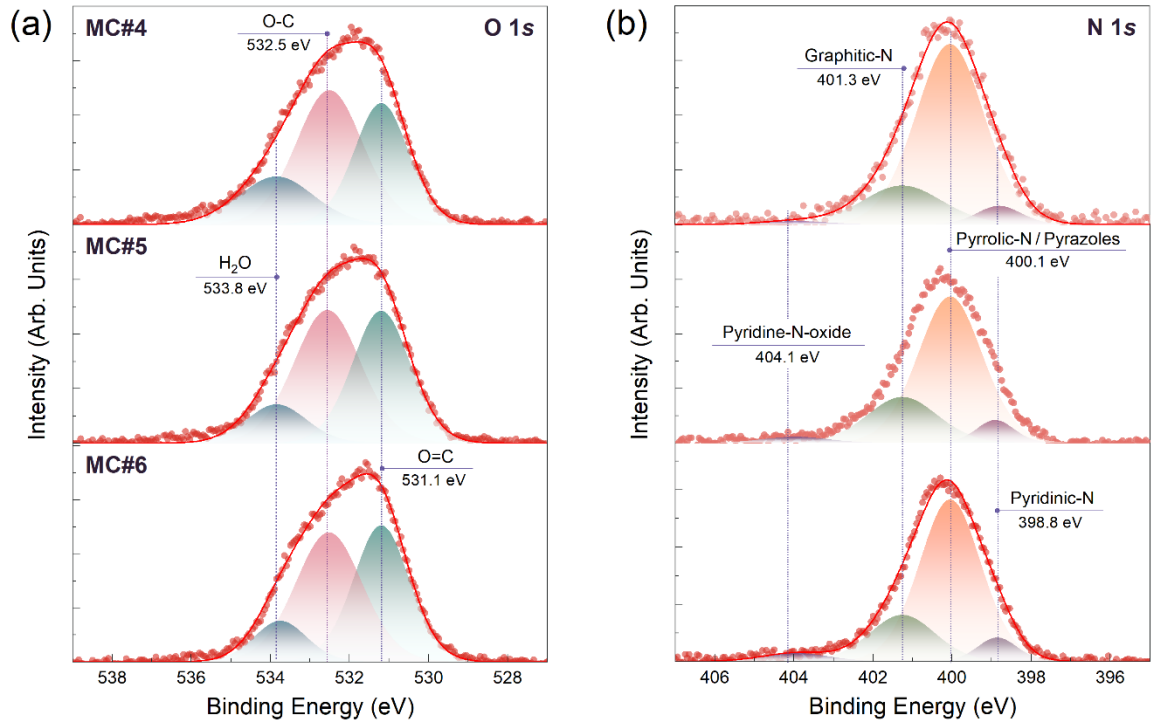


Figure S4. High-resolution (a) O 1*s* and (b) N 1*s* XPS spectra of the MC#4-MC#6 samples

Table S2. The relative contribution of the embedded nitrogen species

Component	Pyridinic-N	Pyrrolic-N / Pyrazoles	Graphitic-N	Pyridine-N-oxide
Binding Energy (eV)	283.7	284.6	285.1	286.8
MC#1	7.8	63.9	22.0	6.3
MC#2	3.8	74.9	19.2	2.1
MC#3	4.1	64.8	27.6	3.5
MC#4	5.1	74.6	18.9	1.4
MC#5	6.3	69.5	23.2	1.0
MC#6	6.6	68.4	21.1	3.9

Section S4. Temperature-dependent resistivity measurements for the MC#6 sample

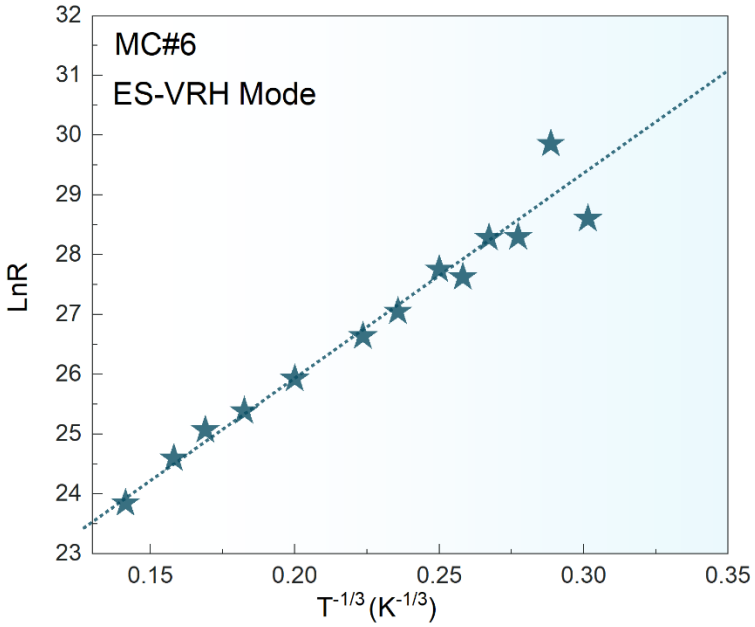


Figure S5. The resistivity LnR versus T-1/2 graphs for the MC#6 sample in the temperature range of 10-50 K