

Supplementary Information

Reduced Graphene Oxide as Water, Carbon Dioxide and Oxygen Barrier in Plasticized Poly(vinyl chloride) Films

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Table S1. Atomic percentages (%) of elements in GO and RGO determined with EDXA.

	C	O	Si	S	K	Mn	I	C:O ratio
GO	56 ± 1	42.3 ± 0.4	0.20 ± 0.01	1.12 ± 0.03	0.16 ± 0.02	0.11 ± 0.02	-	1.32 ± 0.04
RGO	79 ± 2	12.4 ± 0.2	0.33 ± 0.04	-	-	-	8.2 ± 0.1	6.4 ± 0.3

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Fig. S1. Image of the 10 μm thick RGO film. We straightened and cut the film to 10 mm \times 10 mm before we applied it as a barrier layer in the plasticized PVC films.

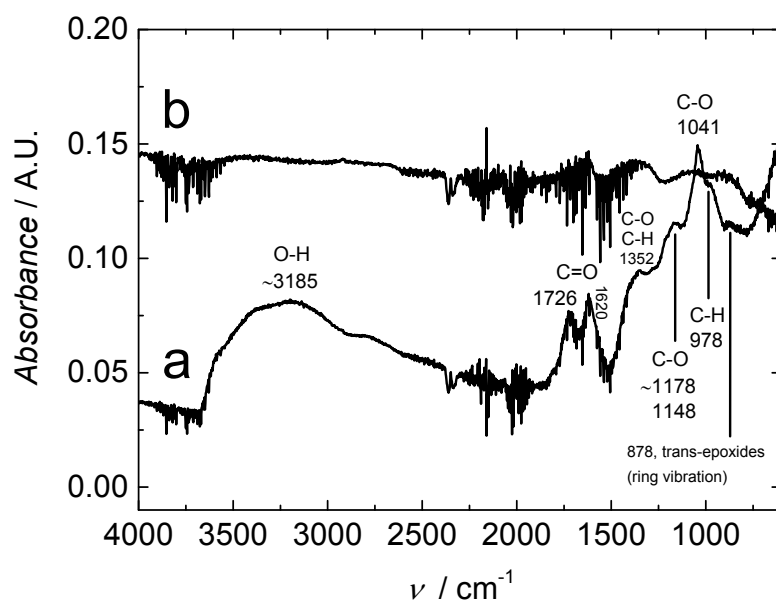


Fig. S2. The FTIR spectra of (a) GO and (b) RGO.

References to the vibrational bands: G. Socrates, *Infrared and Raman Characteristic Group Frequencies, Tables and Charts*, 3rd ed., John Wiley & Sons, Ltd: Chichester, 2001

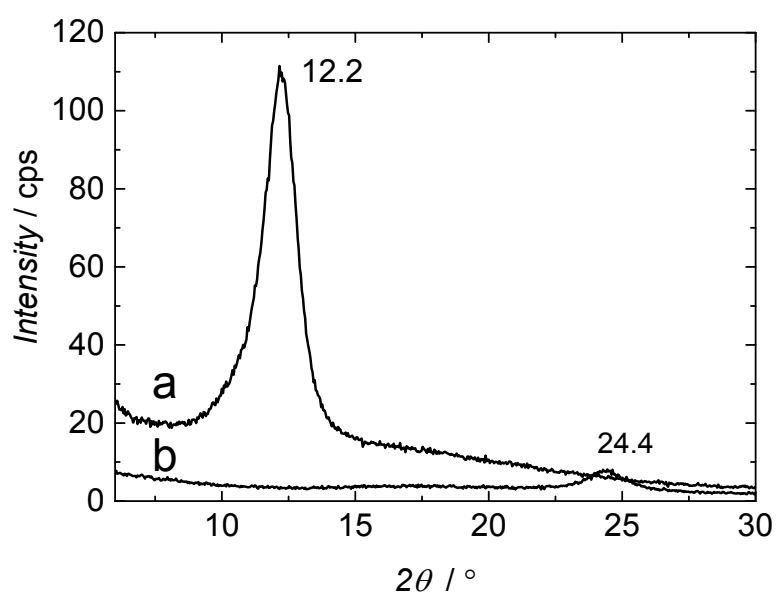


Fig. S3. XRD patterns of (a) GO and (b) RGO.

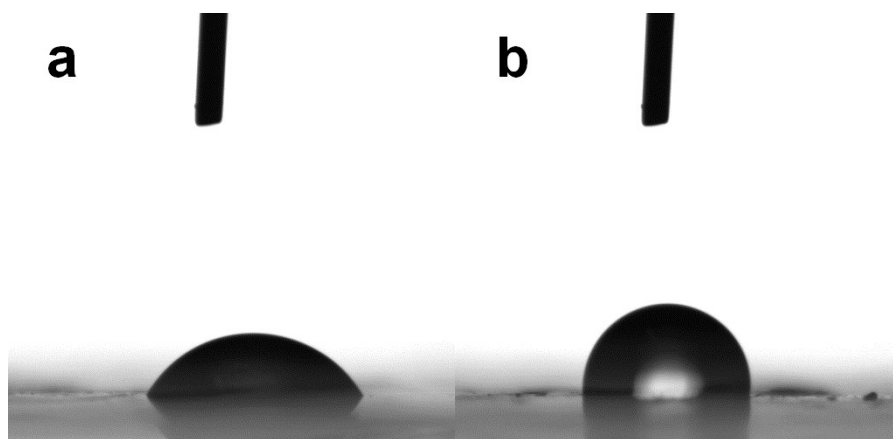


Fig. S4. Water contact angles of (a) GO ($58\pm 3^\circ$) and (b) RGO ($95\pm 1^\circ$).

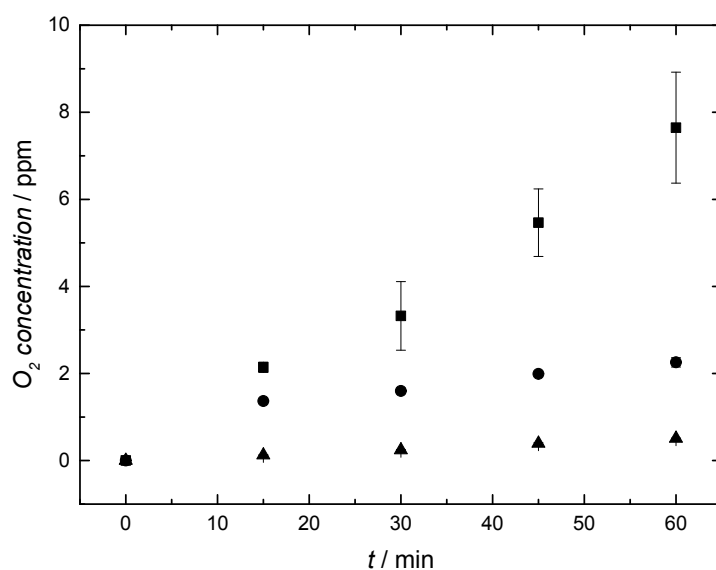


Fig. S5. Oxygen diffusion through the plasticized PVC membrane with (▲) and without (●) the RGO barrier layer. We carried out the control experiment (■) in the absence of a plasticized PVC membrane between the source and the receiving compartments of the oxygen measuring cell. Both compartments were filled with deionized water in all measurements.