Supplementary Materials

Fabrication and Characterization of Free-Standing and Flexible Polyaniline Membranes: Role of Graphene Nanoscrolls

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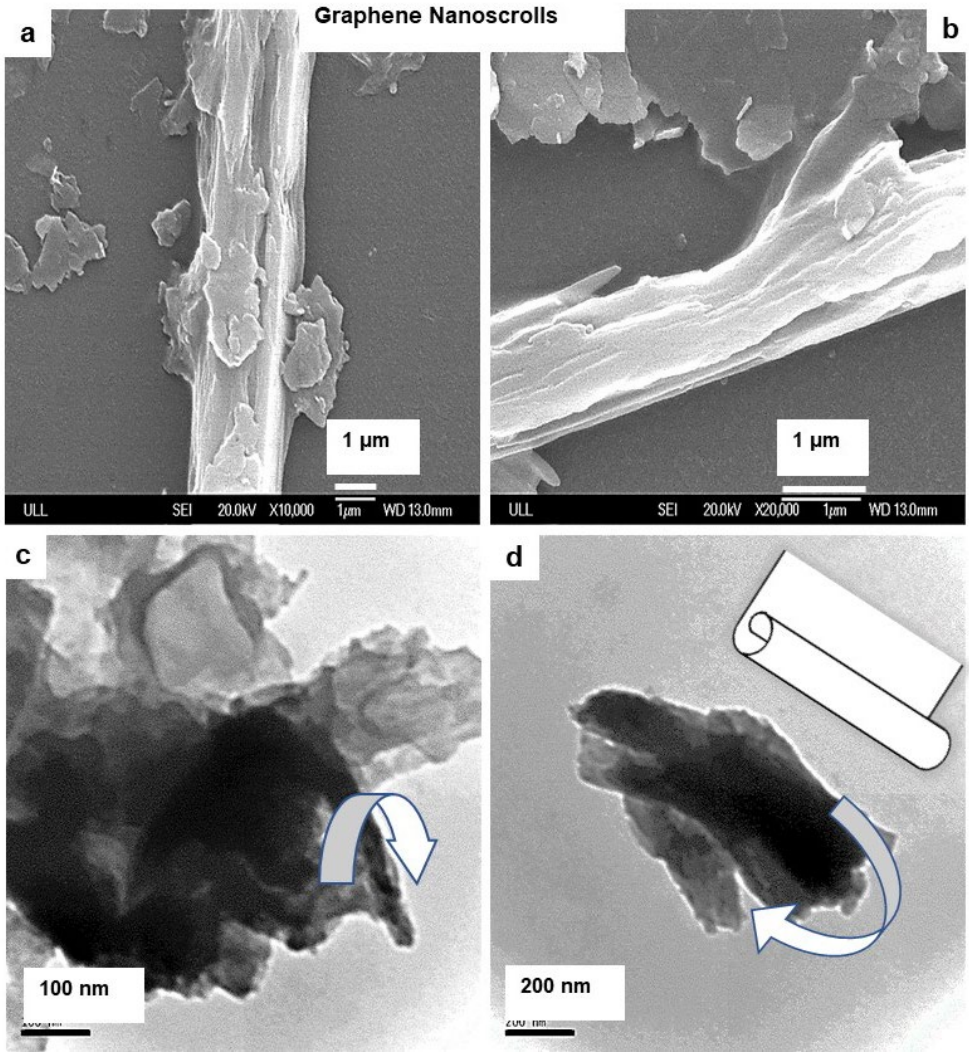

Figure S1. Scanning and transmission electron micrographs of graphene nanoscrolls. Reprinted with permission from Ref. [8].Copyright 2019 John Wiley & Sons, Ltd.

Figure S2. (a-c) Scanning electron micrographs of PANI-GNS composites at various GNS content.

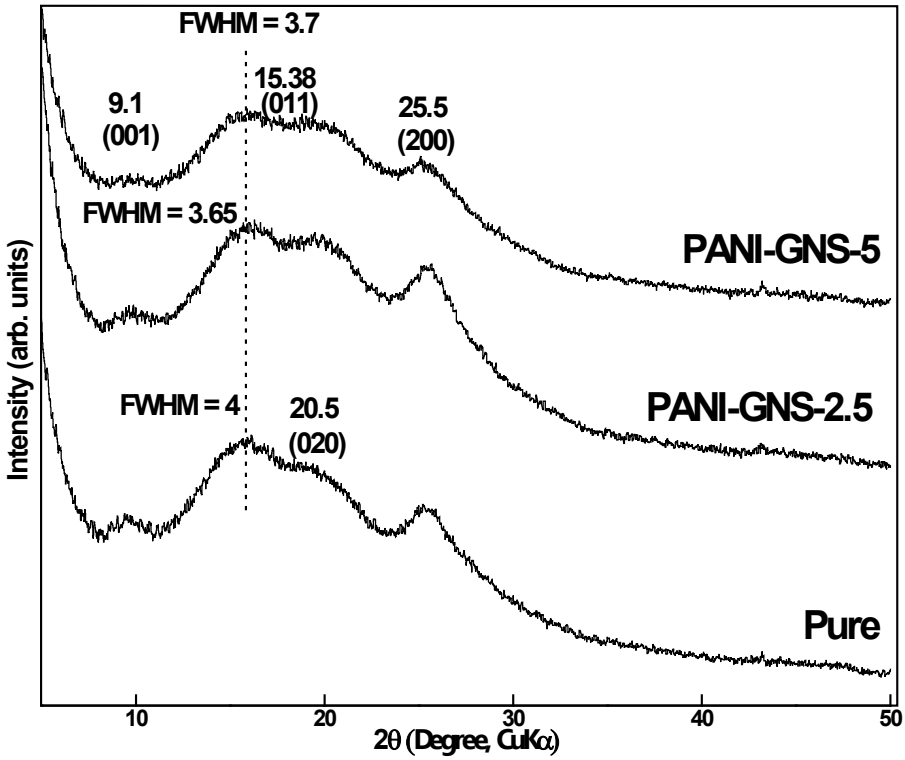

Figure S3. X-ray diffraction (XRD) patterns of prepared flexible nanohybrid membranes. XRD data indicate that the full width at half maximum (FWHM) of the peak at 15.38 (related to the PANI repeat units) decreases in PANI-GNS samples. This peak sharpening is an indication of the molecular arrangement of PANI chains in PANI-GNS samples is ordered (ACS Nano 4(4), 2445-2451, 2010). This data further confirms that the mechanical integrity is provided by the graphene nanoscolls to PANI chains.

Table S1. Full width at half-maximum values of the prepared nanohybrid membranes.

SAMPLE	FWHM (°) FOR 15 (2θ)
PANI	4.0
PANI-GNS-2.5	3.65
PANI-GNS-5	3.7

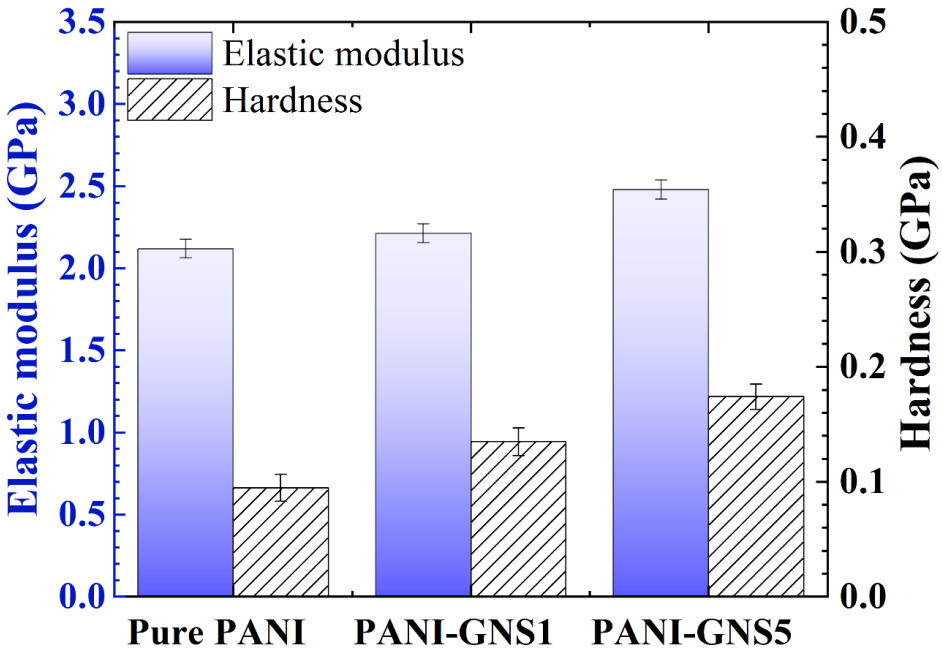

Figure S4. Elastic modulus and hardness values of pure PANI and GNS loaded nanohybrid membranes using nanoindentation.