Supporting Information

Comparison between metal ion and polyelectrolyte functionalization for electrophoretic deposition of graphene nanosheet films

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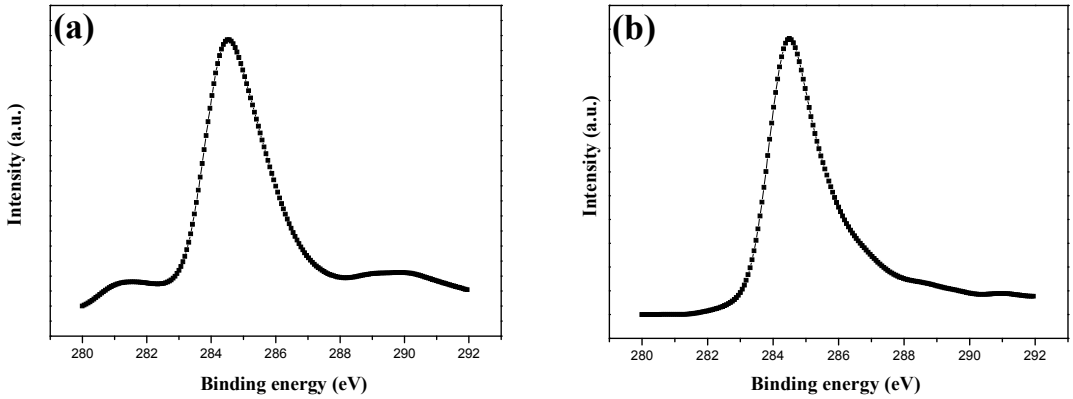

Figure S1 The C 1s XPS spectra of (a) Mg-GNSs film and (b) PDDA-GNSs film

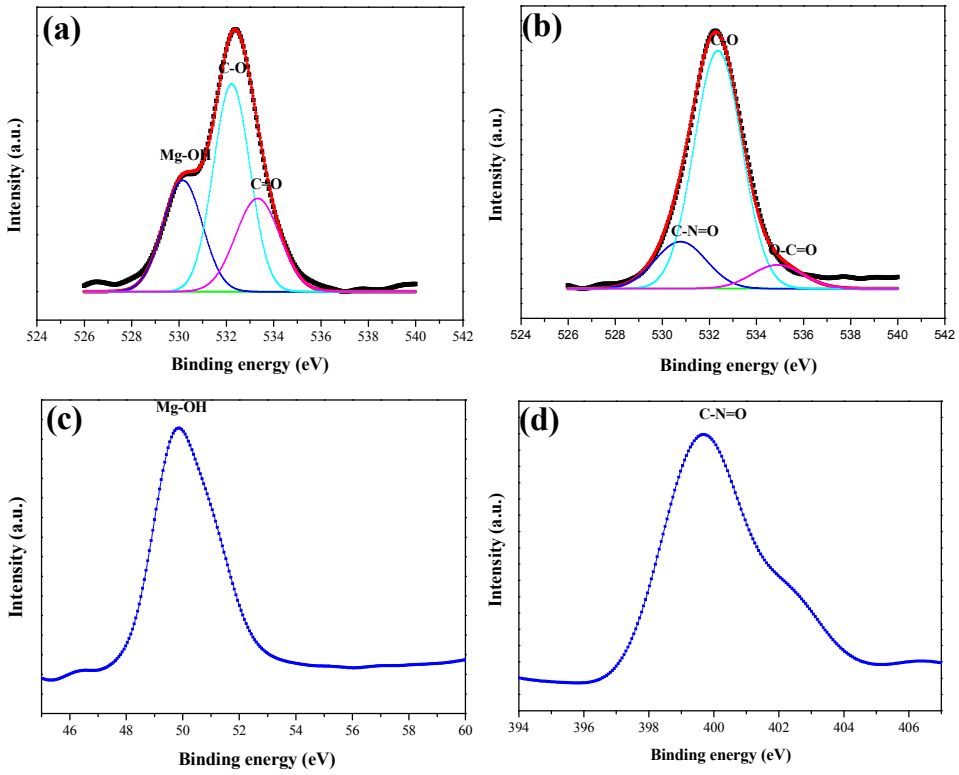

Figure S2 The (a) O 1s and (c) Mg 2p XPS spectra of Mg-GNSs film, the (b) O 1s and (d) N 1s XPS spectra of PDDA-GNSs film.

XPS is a useful surface chemical analysis technique, which is used to determine the species and chemical states of the elements in the surface of the materials. This technique usually gives the desired information within several nanometers of the

surface. As show in Figure S2a, the O1s peak of the Mg-GNSs film was deconvoluted into three peaks located at 530.1 (Mg-OH bond), 533.2 (C–O bonds) and 533.3 (C=O bonds), respectively.[1-4] It was confirmed that the formation of $Mg(OH)_2$ compound on the surface of the GNS film. In addition, from the Mg 2p XPS spectrum (Figure S2c), it is also revealed that $Mg(OH)_2$ existed on the surface of Mg-GNSs film. Meantime, the O1s peak of the PDDA-GNSs film (Figure S2b) was deconvoluted into three peaks located at 530.8 (C-N=O bond), 533.2 (C–O bonds) and 534.9 (O-C=O bonds), respectively. The result revealed that the N element existed as a PDDA compound on the surface of the PDDA-GNSs film. Moreover, an obvious peak existed in the N1s XPS spectrum (Figure S2d), it is also confirmed that the GNS film was modified by PDDA.

1. J. Gao, F. Liu, Y. Liu, N. Ma, Z. Wang and X. Zhang, *Chemistry Mater* 2010, **22**, 2213–2218.

2. D. Joung, A. Chunder, L. Zhai and Si Khondaker, *Nanotechnology* 2010, **21**, 165202-1–5.

3. O. Akhavan, *ACS Nano* 2010, **4**, 4174–4180.

4. S. Stankovich, R. D. Piner, X. Chen, N. Wu, S. T. Nguyen and R. S. Ruoff, *Journal of Materials Chemistry* 2006, **16**. 155-158.