

Supporting Information

Enhanced electrochemical activity of perforated graphene in nickel-oxide-based supercapacitors and fabrication of potential asymmetric supercapacitors

Qi Xun Xia,^a Je Moon Yun,^{b*} Rajaram S. Mane,^b Lei Li,^a Jianjian Fu,^a Jae Hong Lim,^c and Kwang Ho Kim^{*,a, b}

^aSchool of Materials Science and Engineering, Pusan National University, San 30 Jangjeon-dong, Geumjeong-gu, Busan 609-735, Republic of Korea

^bGlobal Frontier R&D Center for Hybrid Interface Materials, Pusan National University, San 30 Jangjeon-dong, Geumjeong-gu, Busan 609-735, Republic of Korea

^cMaterials Processing Division, Korea Institute of Materials Science (KIMS), Changwon 642-831, Republic of Korea

Email: kwhokim@pusan.ac.kr (K. H. Kim, Prof.)

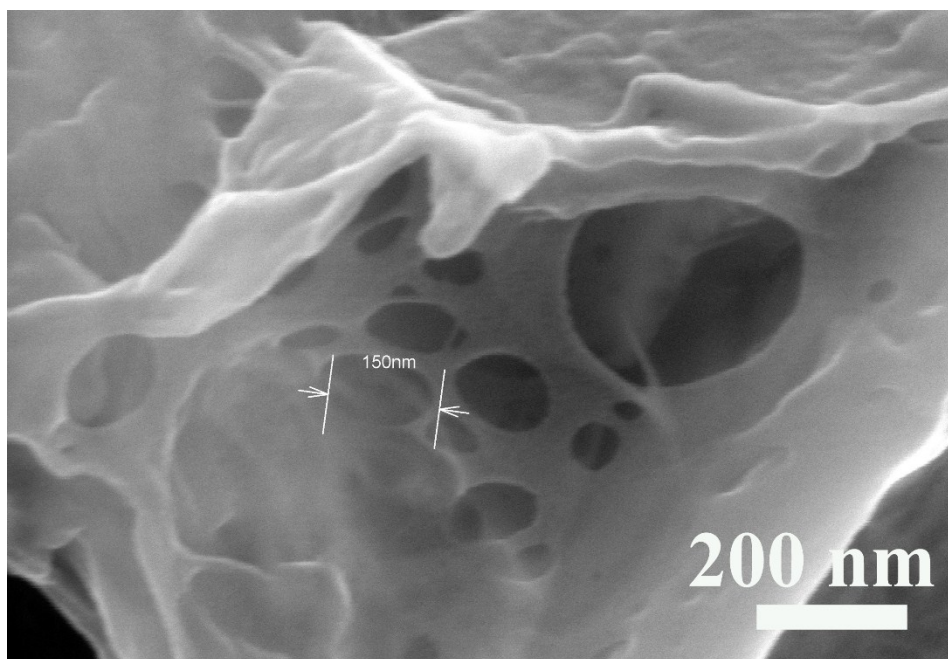


Figure S1. FESEM images of perforated graphene oxide.

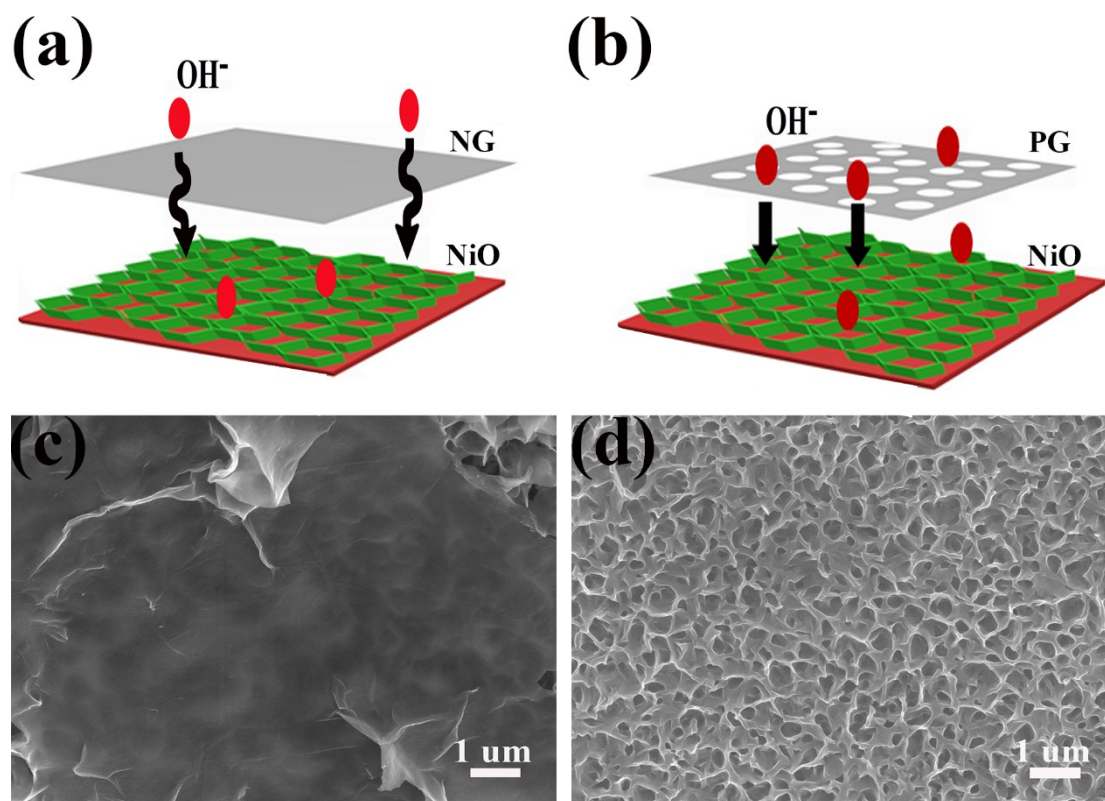


Figure S2. (a, b) Schemes of the formation of NiO/NG and NiO/PG, and (c, d) their respective FESEM images.

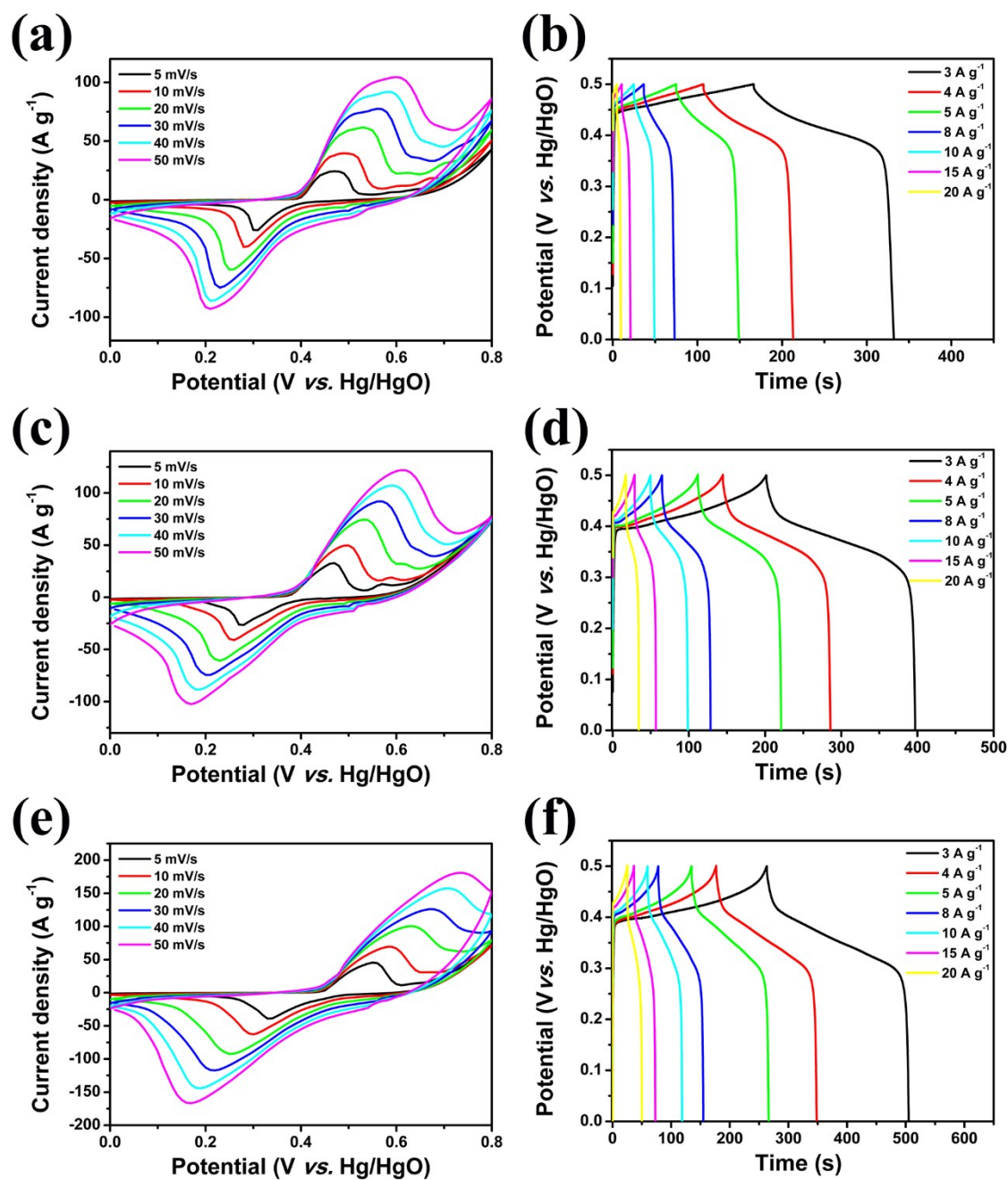


Figure S3. CV curves and galvanostatic charge-discharge measurements of (a, b) NiO, (c, d) NiO/NG, and (e, f) NiO/PG electrodes.

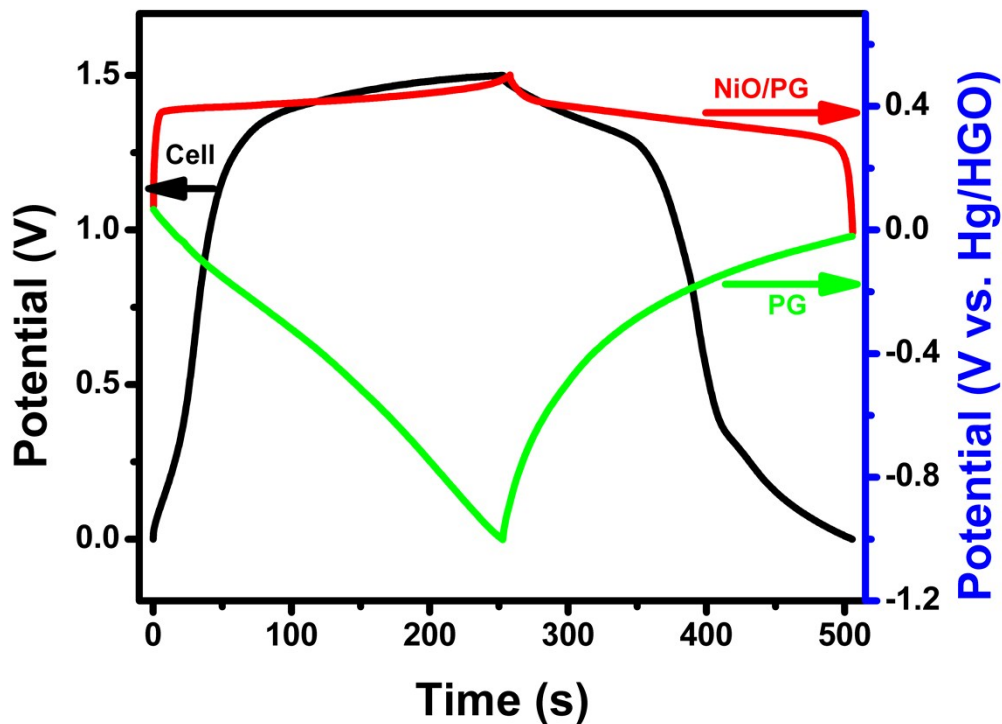


Figure S4. Galvanostatic charge-discharge curves of the asymmetric cell and the in situ tracked variation of the potential in each individual electrode.

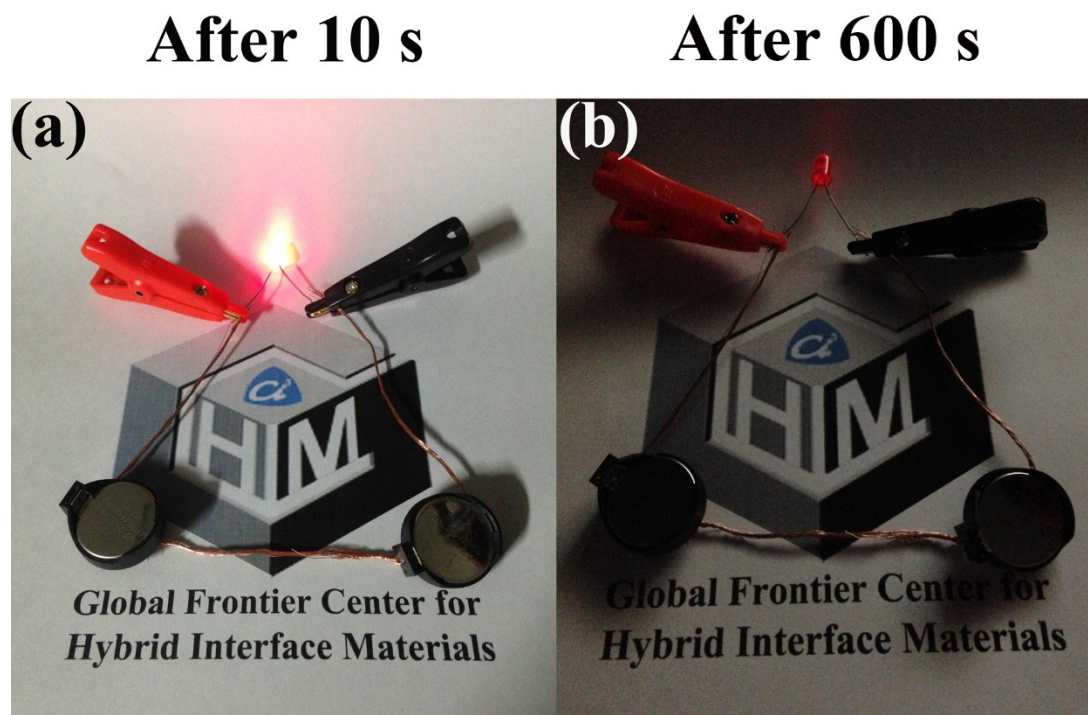


Figure S5. Digital photographs presenting the red LED powered by two ASCs connected in series (a) after 10 s, and (b) after 600 s.

Table S1. EIS fitting parameters of PG electrode.

| R_s (Ω) | R_{ct} (Ω) | CPE (F) | Z_w (Ω s ^{-1/2}) | C_{ps} (F) |
|--------------------|-----------------------|---------|--------------------------------------|--------------|
| 1.86 | 3.36 | 0.03 | 0.22 | 11.09 |