

Supporting Information

High-rate Capacitive Performance of Graphene Aerogel with a Superhigh C/O Molar Ratio

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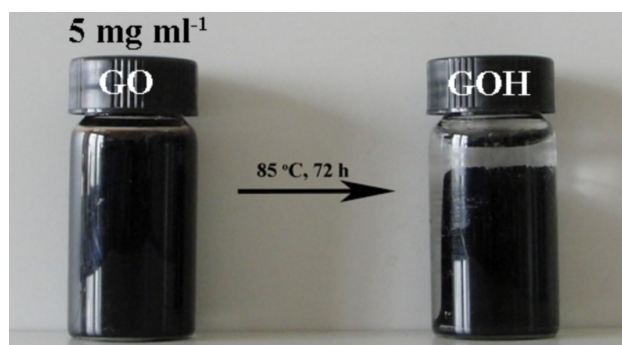


Figure S1 Optical images of GO suspension in deionized water (left) and graphene oxide hydrogel after self-assembly process (right)

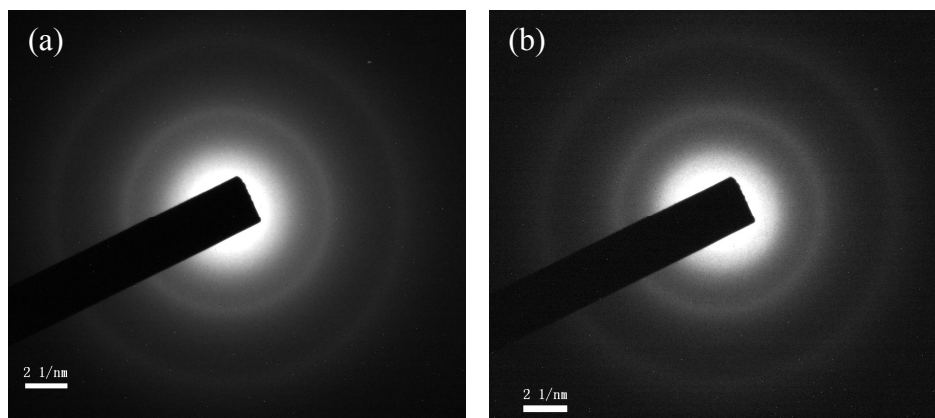


Figure S2 SAED patterns for (a) GOA and (b) GA

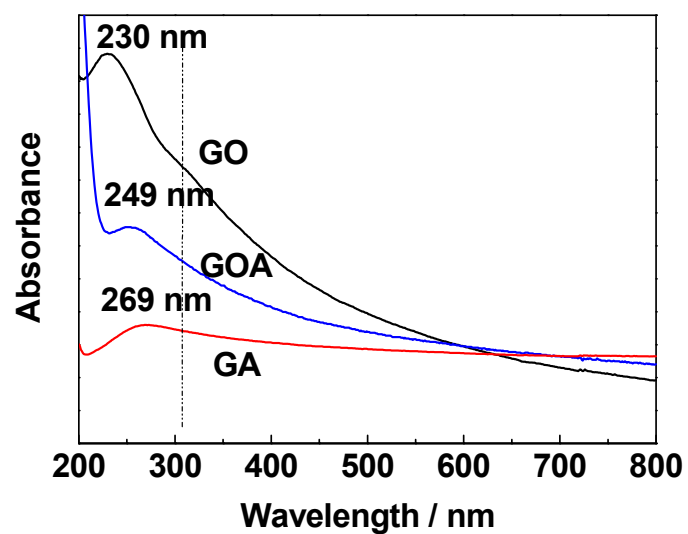


Figure S3 UV-Vis absorption spectra of GO, GOA and GA

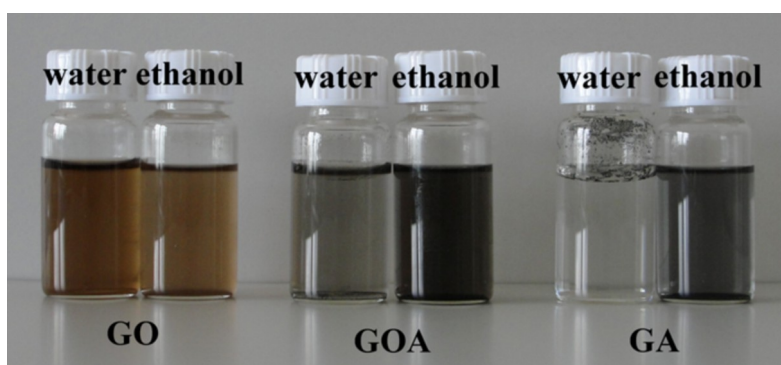


Figure S4 Optical images of samples dispersed in deionized water and ethanol (solution concentration: 0.1 mg mL^{-1})

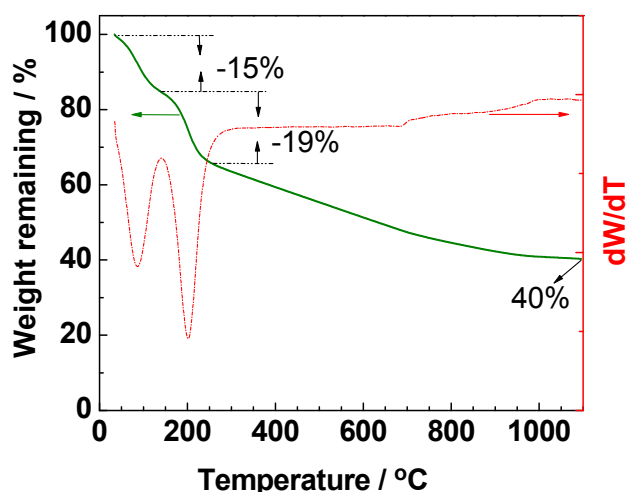


Figure S5 TG and differential thermogravimetry (DTG) curves of GOA

The weight change of GOA during thermal treatment process under H_2 atmosphere is recorded by TG analysis. There are two obvious weight losses within the temperature ranges of 20-150 °C and 150-300 °C, corresponding to the release of adsorbed water and decomposition of oxygen-containing groups such as carboxylic and lactone groups, ^[1,2] respectively. Other oxygen-containing groups (carbonyl, phenol, quinine and hydroxyl groups) are decomposed at temperatures ranging from 400 to 1000 °C. ^[2] There is no obvious weight change above 1000 °C, which indicates that most oxygen-containing groups are eliminated completely at 1000 °C. The remaining weight is about 40 % when the temperature reaches up to 1100 °C.

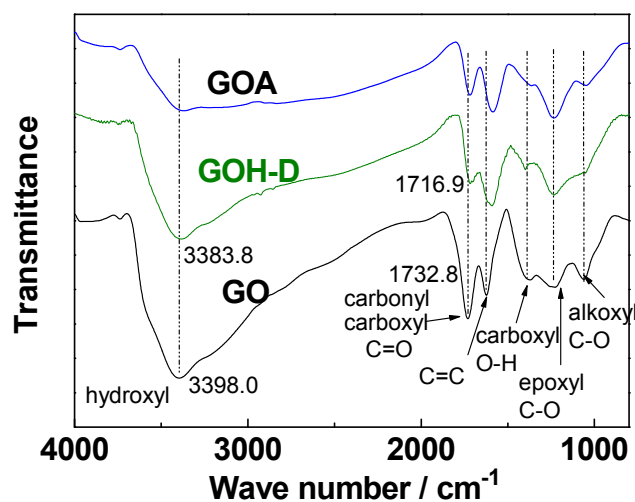


Figure S6 FT-IR spectra of GO, GOH-D (vacuum dried graphene oxide hydrogel) and GOA

Graphene oxide hydrogel was further vacuum dried at 50 °C to obtain GOH-D. Compared with GOH-D, there is an obvious decrease of hydroxyl groups in the spectrum of GOA, which is probably due to the dynamic operation at high pressure (20 MPa) during supercritical CO₂ drying.

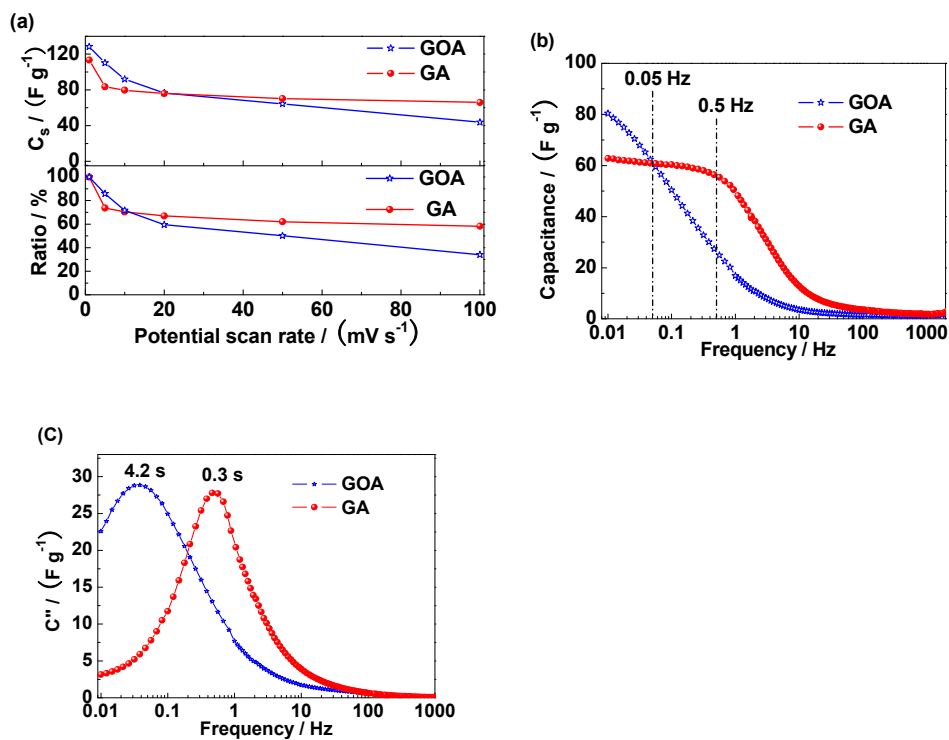


Figure S7 (a) Specific capacitance and capacitance retention ratio at different potential scan rates in ; (b) a plot of specific capacitance vs. Frequency; (c) imaginary part of capacitance vs. frequency for GOA and GA

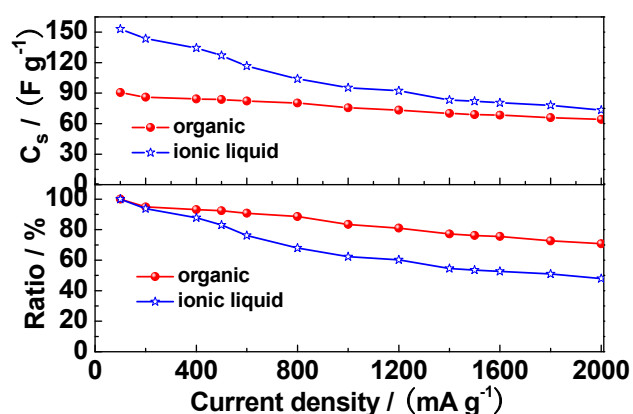


Figure S8 The specific capacitance and its retention ratio vs. current densities of GA in both organic and ionic liquid electrolytes

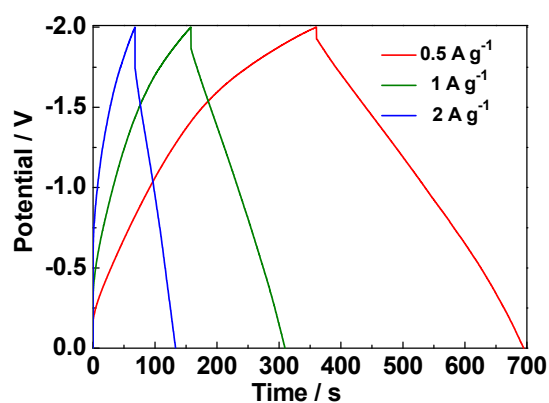


Figure S9 Galvanostatic charge-discharge curves of GA at different current densities in organic electrolyte

References in supporting information

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