Electronic Supporting Information (ESI)

Collaborative design of Li-S battery using 3D N-doped graphene aerogel as a sulfur host and graphitic carbon nitride paper as an interlayer

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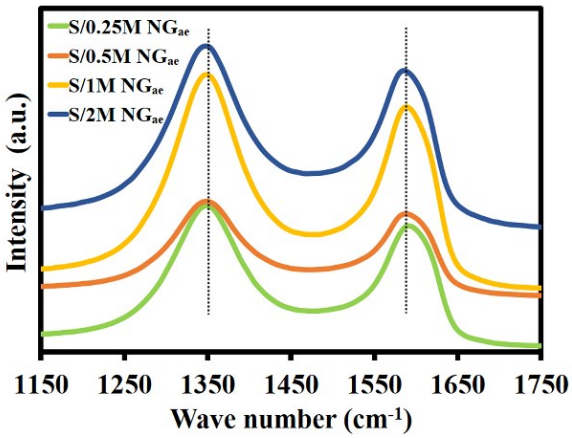

Fig. S1. Raman spectra of NG_{ae} at different hydrazine concentrations.

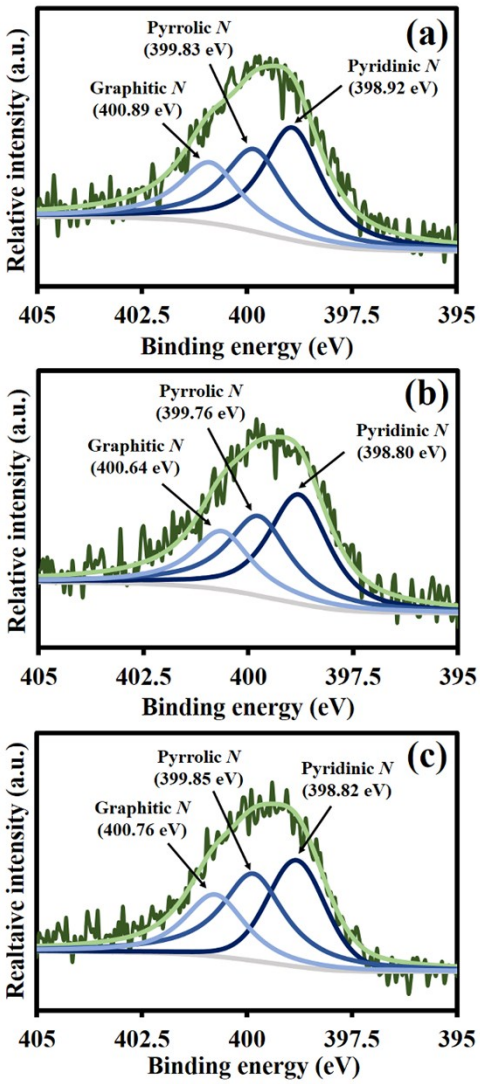

Fig. S2. Narrow scan N1s spectra of (a) 0.25M, (b) 0.5M, and (c) 2M NG_{ae}.

Fig. S3a shows an FE-SEM image of g-C_3N_4 which indicates a typical porous morphology of this material. In addition, a Raman spectrum (**Fig. S3b**) represents the result, which is in good agreement with other previous works[1-3]. An XRD pattern in **Fig. S3c** shows two diffraction peaks at 2θ of 13.1° and 27.5°, which can be referred to the crystallographic planes of (100) and (002), respectively. The characteristic peak at the 2θ of 13.1° belongs to the interlayer graphitic stacking. Whilst, a peak at 27.5° exhibits the in-planar tri-s-triazine units of as-prepared g-C_3N_4[4, 5]. In addition, an FTIR spectrum (**Fig. S3d**) reveals a sharp peak at 809 cm^{-1} indicating the C-N stretching vibration of triazine cycles. Other peaks from 1240 to 1650 cm^{-1} can be assigned to C-N heterocycles. The peaks at 1241 and 1315 cm^{-1} correspond to N-C_3 (full condensation) and C-N-C (partial condensation), respectively. Whilst, the peaks at 1409, 1564, and 1640 cm^{-1} represent the heptazine-derive repeating units. In addition, the peak at 888 cm^{-1} and the broad peaks between 3000-3500 cm^{-1} can be assigned to the N-H stretching vibration from the partial condensation of amino groups[6-8]. All of these peaks show the typical characteristics of g-C_3N_4.

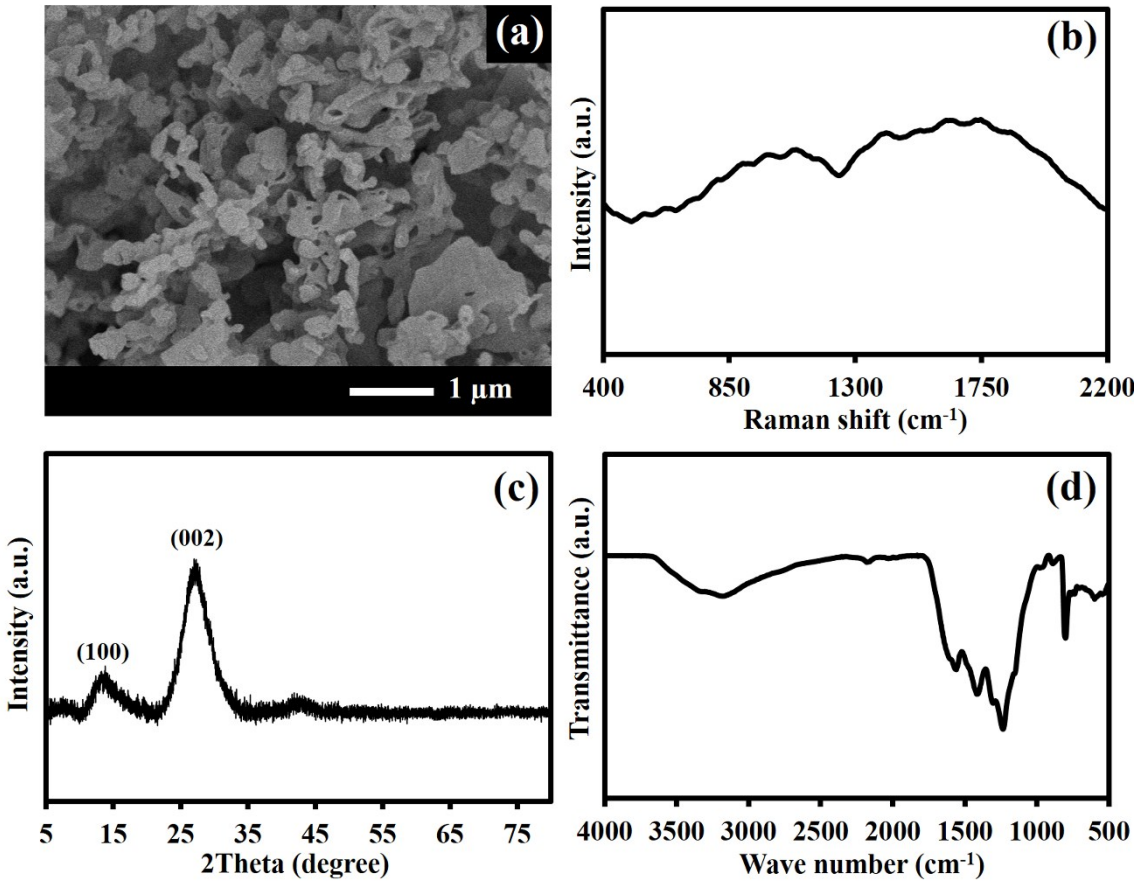

Fig. S3. (a) FE-SEM image, (b) Raman spectrum, (c) XRD pattern, and (d) FTIR spectrum of g-C_3N_4.

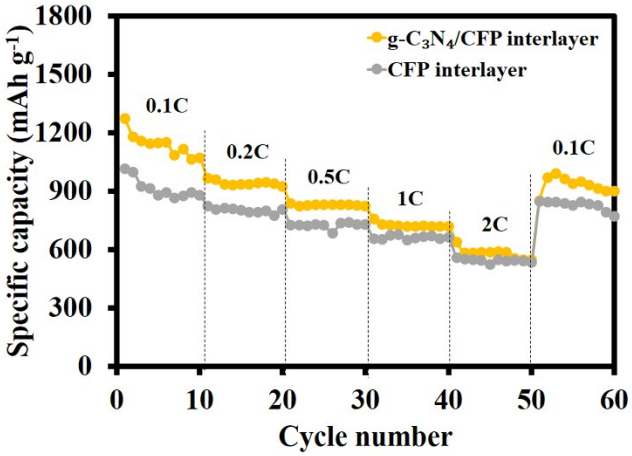

Fig. S4. Specific capacity of LSBs at different applied current densities (0.1C-2C) with CFP and g-C_3N_4/CFP interlayers.

References

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