

*Supplementary Information for*

**Graphene-sandwiched nitrogen-enriched  $\pi$ -conjugated molecules as redox-active cathodes for Li-ion batteries**

**Kai Chen, Xiaolan Ma, Xiaoyan Han\*, and Yingkui Yang\***

*Key Laboratory of Catalysis and Energy Materials Chemistry of Ministry of Education & Hubei Key Laboratory of Catalysis and Materials Science, South-Central Minzu University, Wuhan 430074, China*

*E-mail: [xyhan@scuec.edu.cn](mailto:xyhan@scuec.edu.cn) (X. Han)*

*E-mail: [ykyang@wtu.edu.cn](mailto:ykyang@wtu.edu.cn) (Y. Yang)*

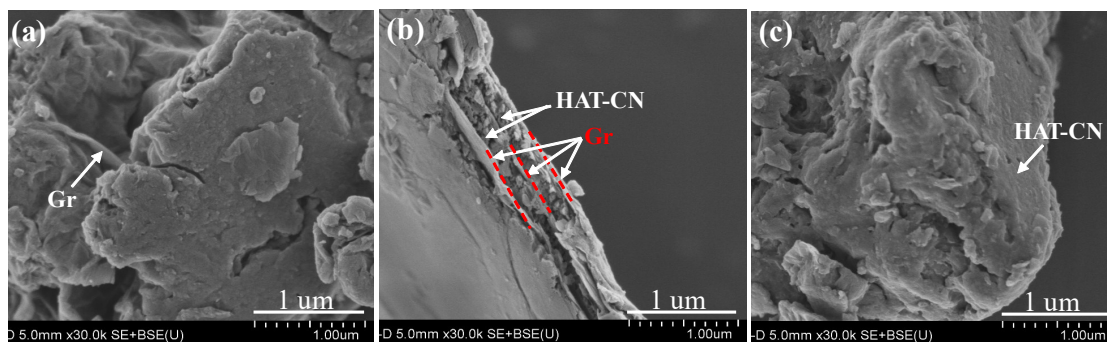


Figure S1 SEM images of HAT-CN@Gr-1 (a), HAT-CN@Gr-2 (b) and HAT-CN@Gr-3 (c) composites.

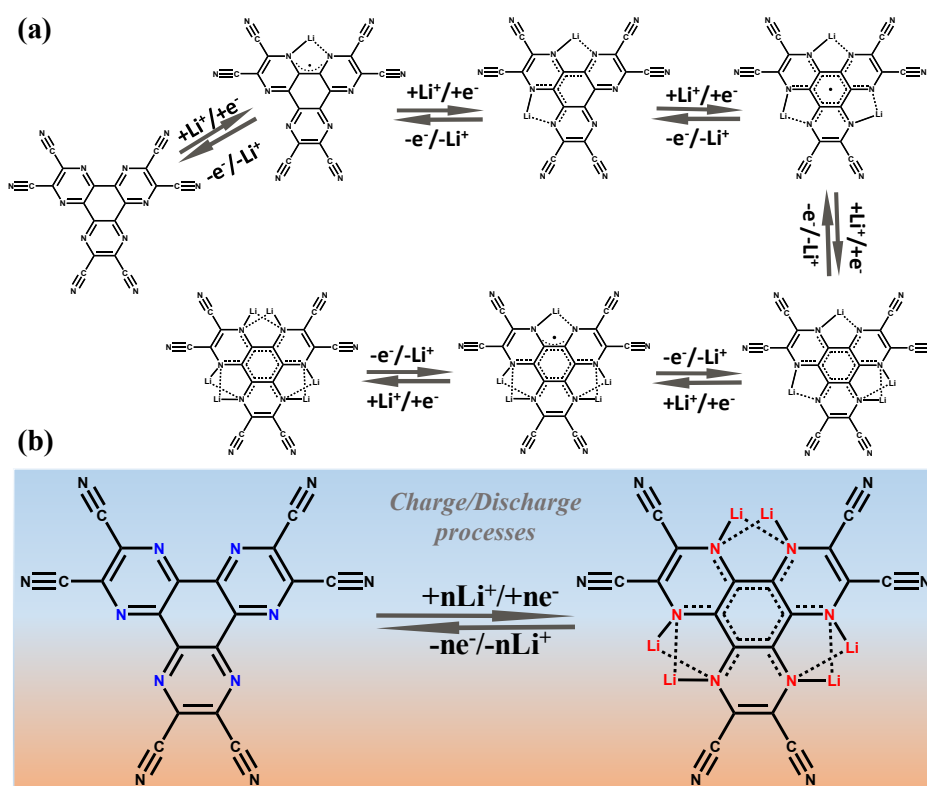


Figure S2 The mechanism of Li-ions insertion/extraction into/from HAT-CN unit (a) and the proposed electrochemical redox mechanism of HAT-CN cathode (b).

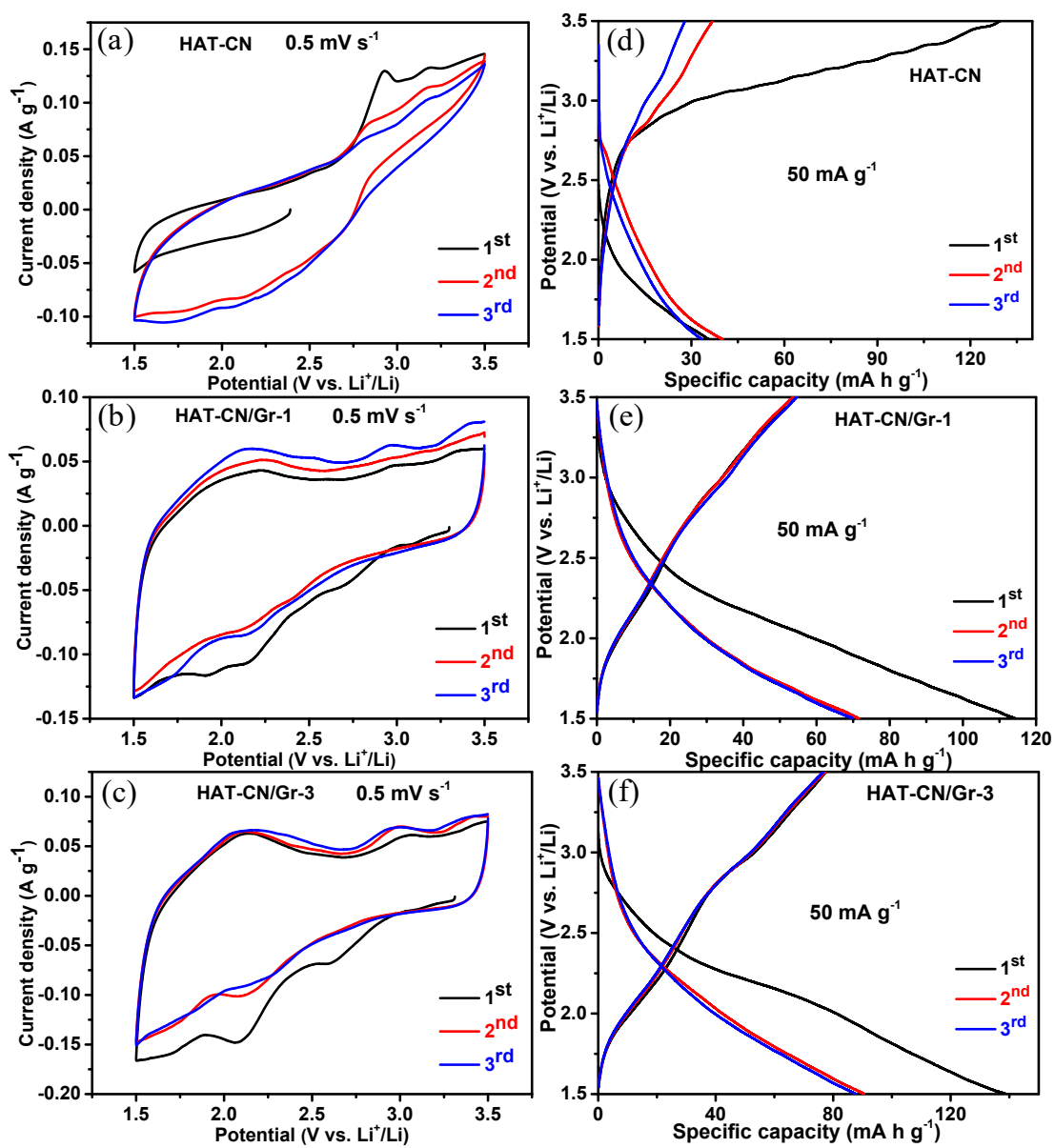


Figure S3 Typical CV curves and charge/discharge voltage profiles of HAT-CN and HAT-CN@Gr composites in the first three cycles.

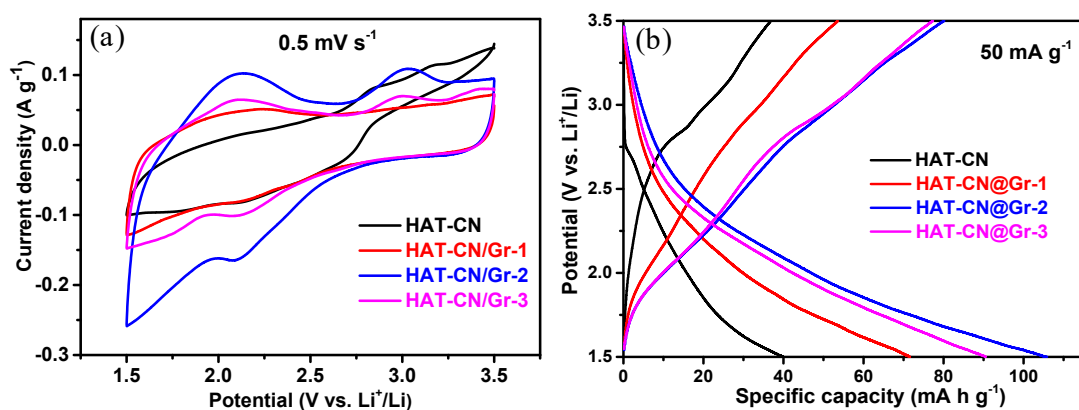


Figure S4 (a) CV curves and (b) charge/discharge voltage profiles of HAT-CN and HAT-CN@Gr for the 2<sup>nd</sup> cycle.

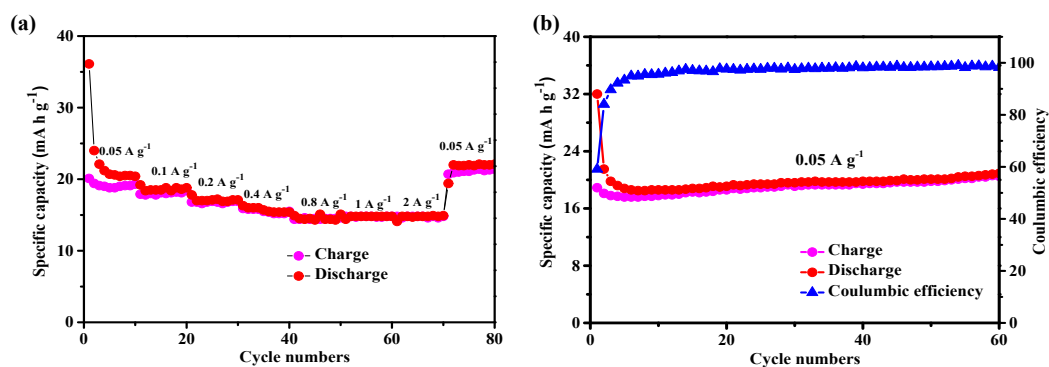


Figure S5 Rate performance (a) and cycling stability (b) for the Gr cathodes.

**Table S1** Elemental contents of HAT-CN and HAT-CN/Gr composites obtained from elemental analysis.

Sample	N [wt%]	C [wt%]	H [wt%]
HAT-CN	42.36	55.12	0.352
HAT-CN/G-3	13.99	57.7	3.185
HAT-CN/G-2	17.64	56.6	3.125
HAT-CN/G-1	21.85	56.31	3.051