

Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.
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Supporting Information for

**High performance carbon-coated hollow Ni₁₂P₅ nanocrystals
decorated on GNS as advanced anodes for lithium and sodium
storage**

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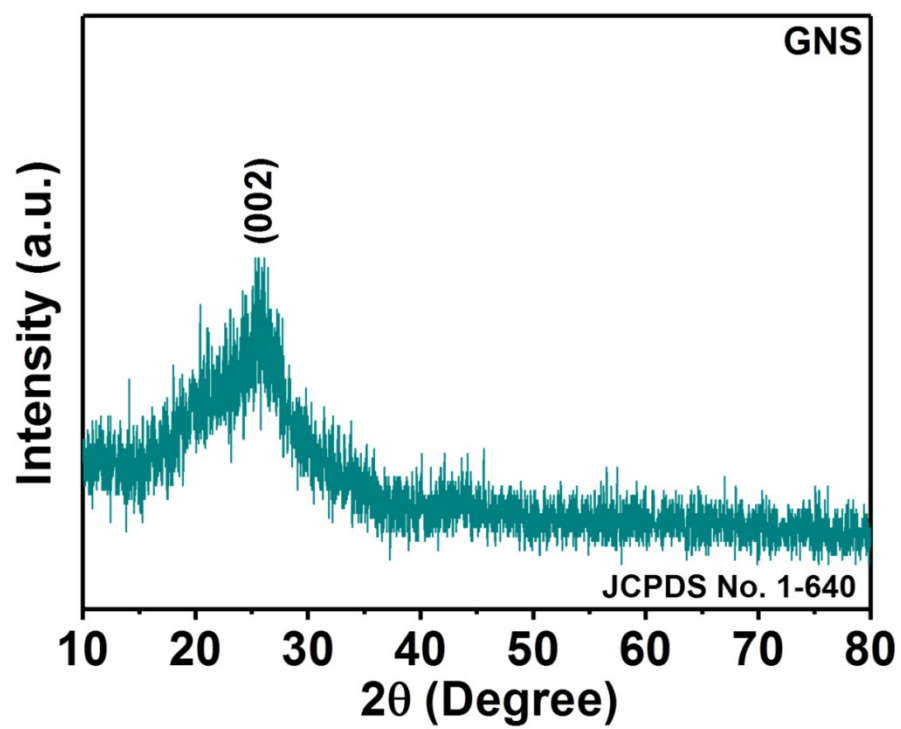


Fig. S1 X-ray diffraction of pure GNS.

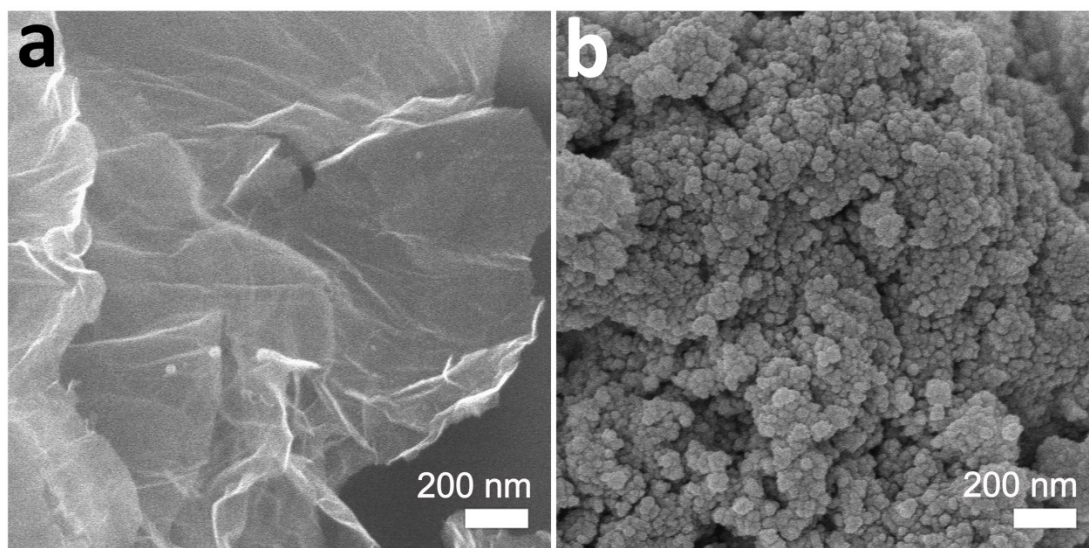


Fig. S2 SEM images of (a) GNS and (b) pure $\text{Ni}_{12}\text{P}_5@C$ nanocrystals.

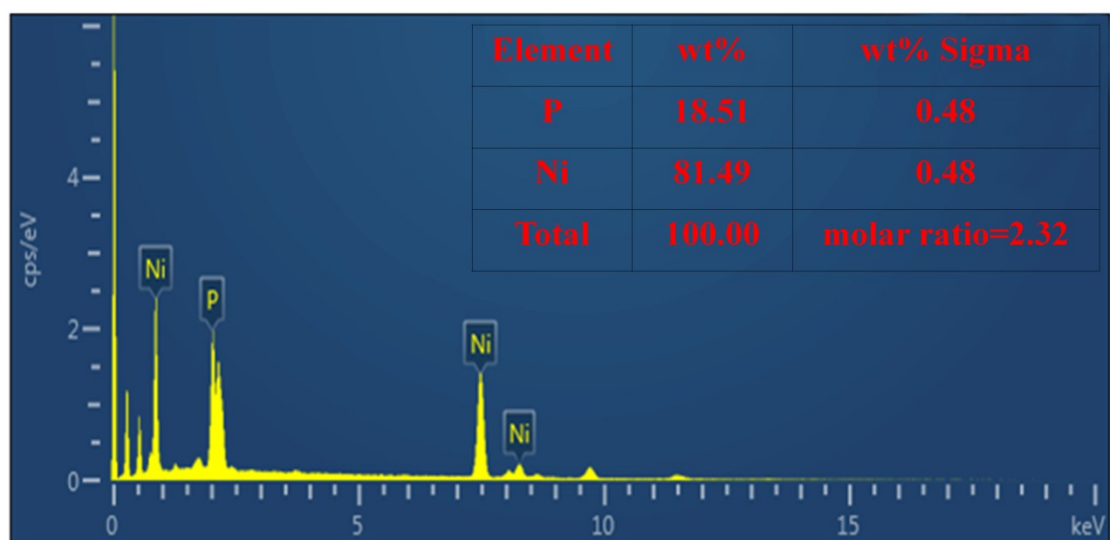


Fig. S3 EDS spectrum of $\text{Ni}_{12}\text{P}_5\text{@C/GNS}$ composite.

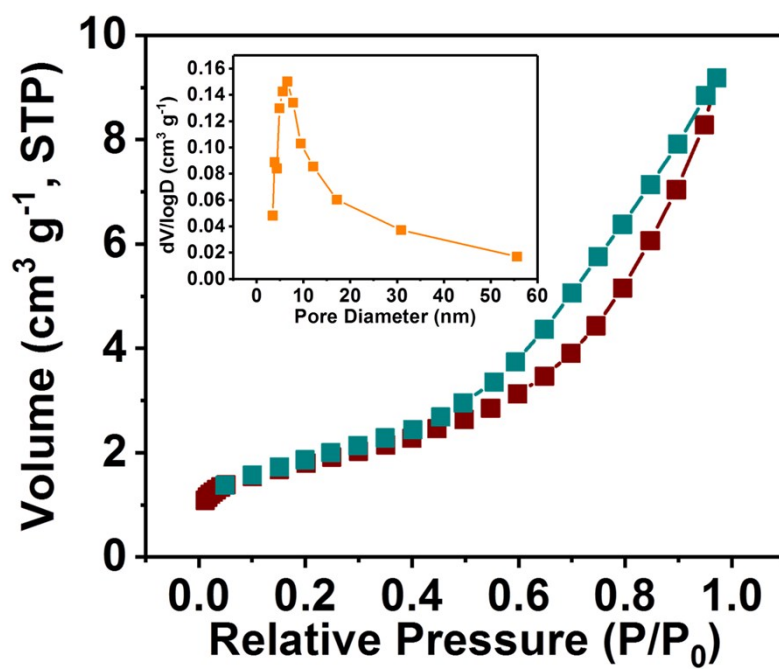


Fig. S4 Nitrogen absorption/desorption isotherm of pure $\text{Ni}_{12}\text{P}_5@\text{C}$ (wine: nitrogen adsorption curve; dark cyan: nitrogen desorption curve).

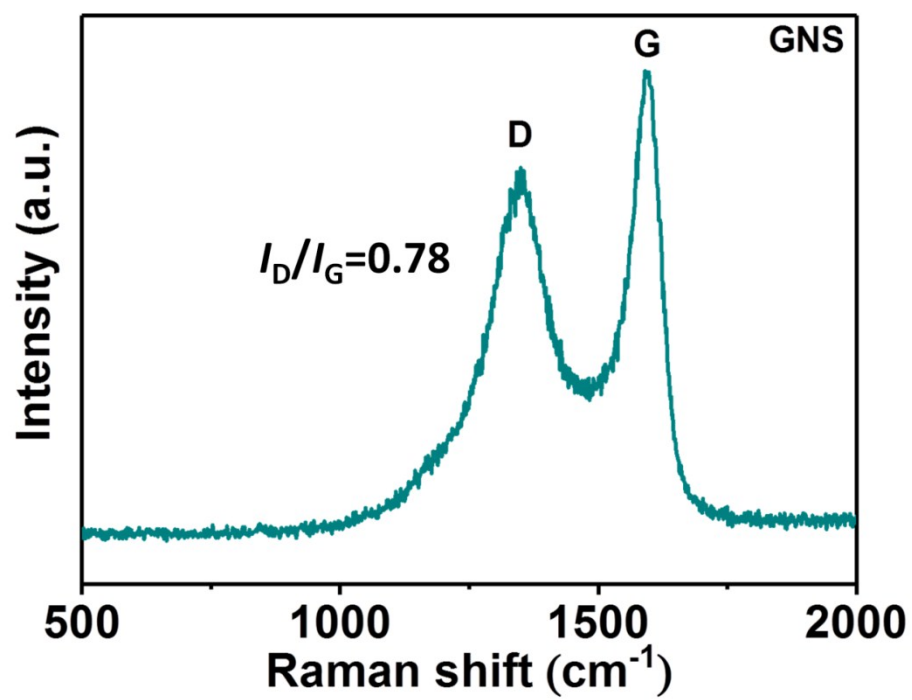


Fig. S5 Raman spectrum of Ni₁₂P₅@C/GNS.

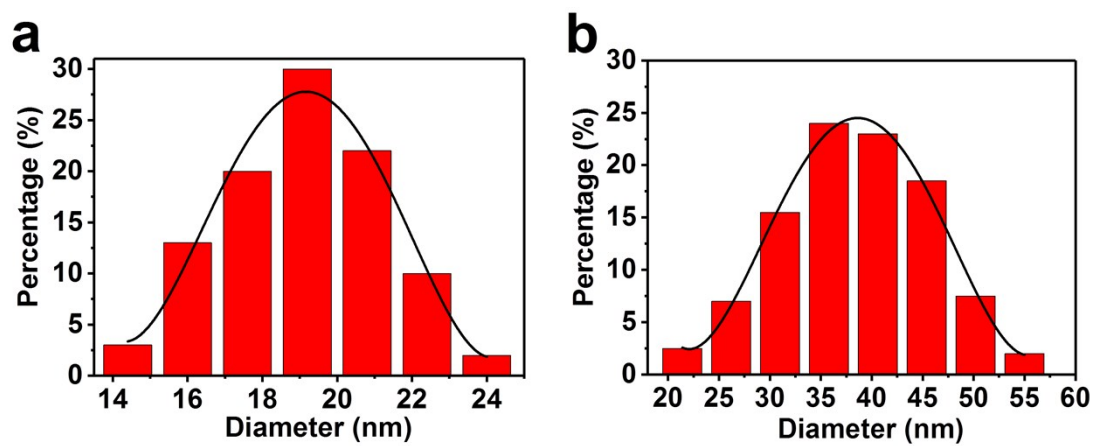


Fig. S6 Diameter distribution of (a) Pure $\text{Ni}_{12}\text{P}_5@\text{C}$ and (b) $\text{Ni}_{12}\text{P}_5@\text{C}/\text{GNS}$.

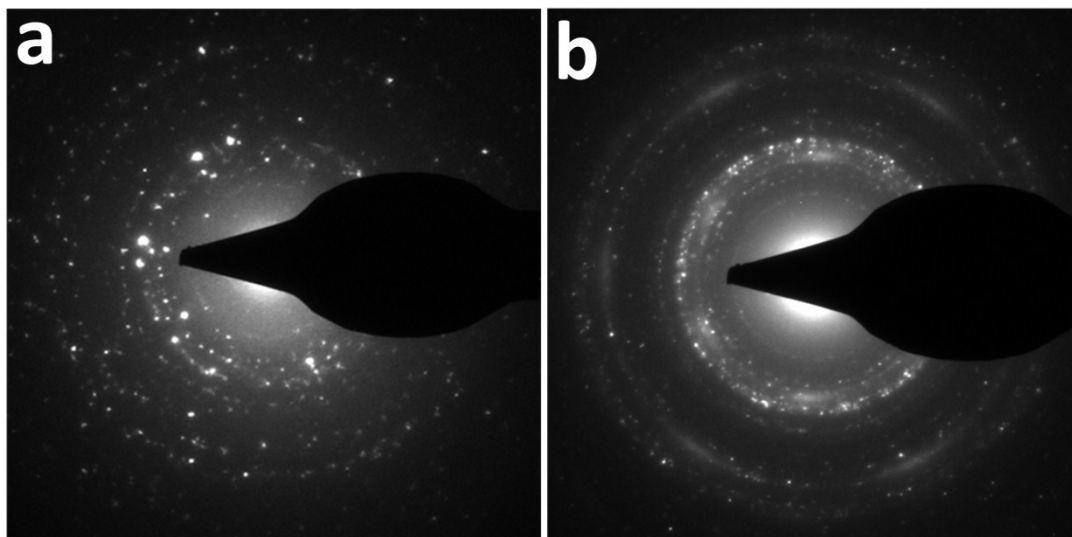


Fig. S7 SAED patterns of (a) Pure $\text{Ni}_{12}\text{P}_5@\text{C}$ and (b) $\text{Ni}_{12}\text{P}_5@\text{C}/\text{GNS}$.

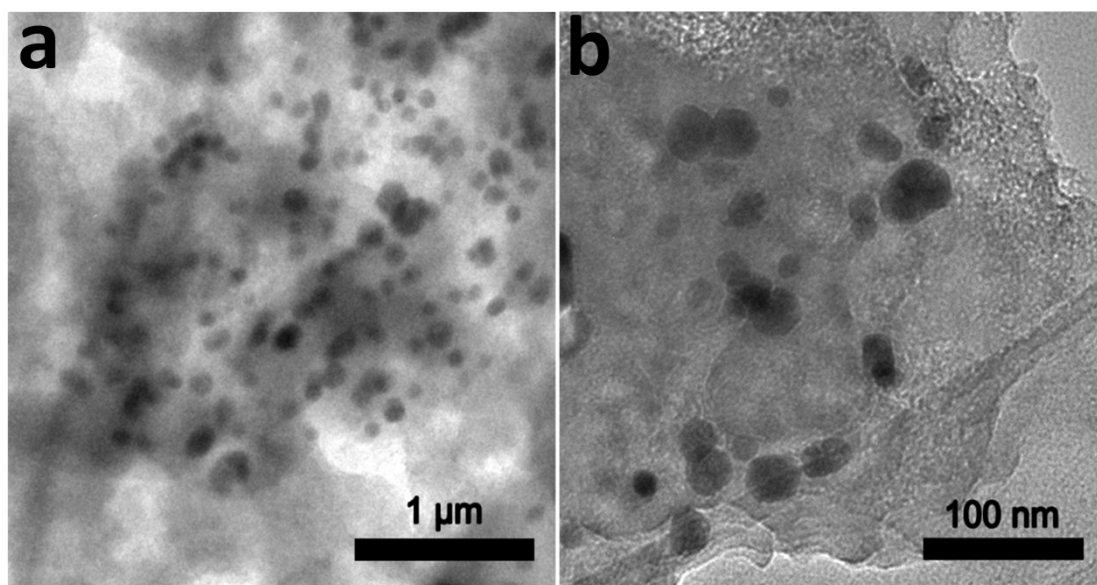


Fig. S8 Different magnification TEM images of $\text{Ni}_{12}\text{P}_5@\text{C}/\text{GNS}$ after 100 cycles.

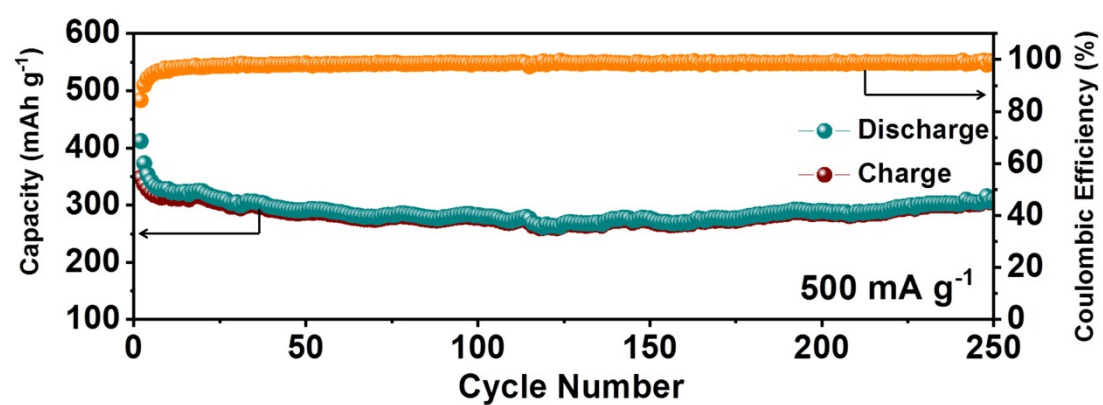


Fig. S9 Long-term cycling performance and coulombic efficiency of the $\text{Ni}_{12}\text{P}_5@\text{C}/\text{GNS}$ electrode for LIBs at 500 mA g^{-1} .