

Supporting information

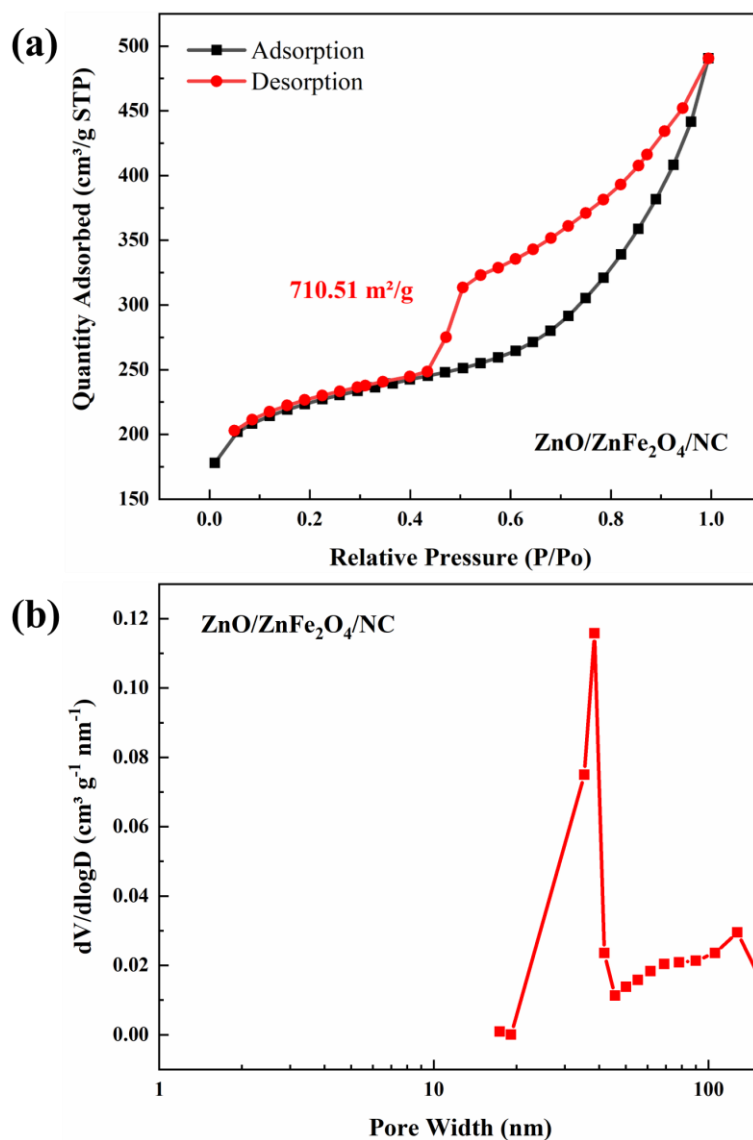


Figure S1. (a) Nitrogen adsorption and desorption isotherms; **(b)** distribution of pore size structure of ZnFe/NC

The specific surface area of ZnFe/NC is 710.51 m²/g, and the pore size distribution is mainly composed of mesopores at 38.45 nm and macropores at 127.55 nm. The reason why the specific surface area of ZnO/ZnFe₂O₄/NC is smaller than that of ZnFe/NC may be due to the gradual occupation of large pores during the crystallization process of metal oxides. However, the reason why the electrochemical performance of ZnO/ZnFe₂O₄/NC is superior to that of ZnFe/NC is that it increases the synergistic effect of ZnO and ZnO/ZnFe₂O₄/NC bimetallic oxides on the basis of ZnFe/NC carbon nitrogen materials.

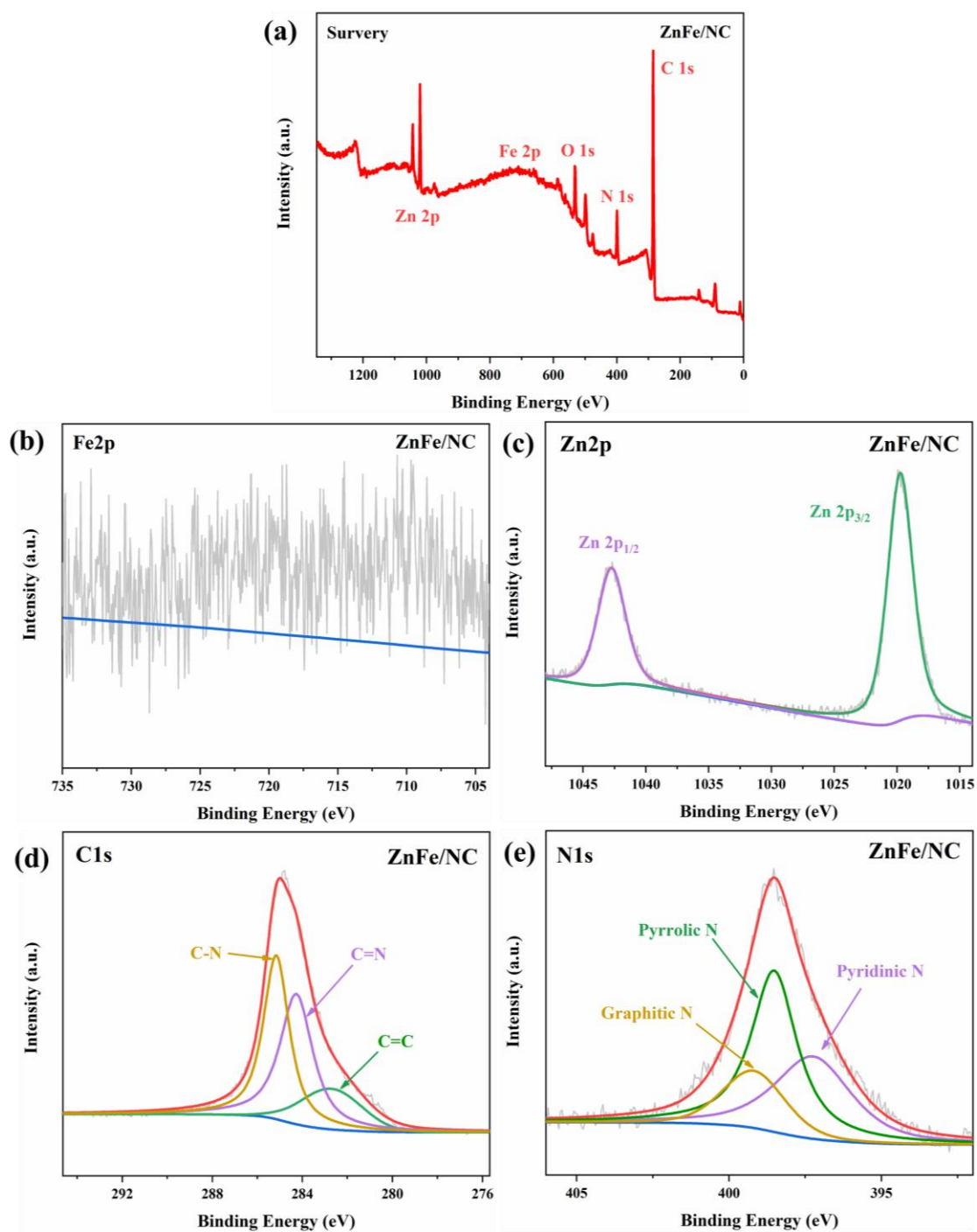


Figure S2. XPS spectra of ZnFe/NC: **(a)** total spectrum; high-resolution XPS spectra of **(b)** Fe 2p; **(c)** Zn 2p; **(d)** C 1s; **(e)** N 1s.

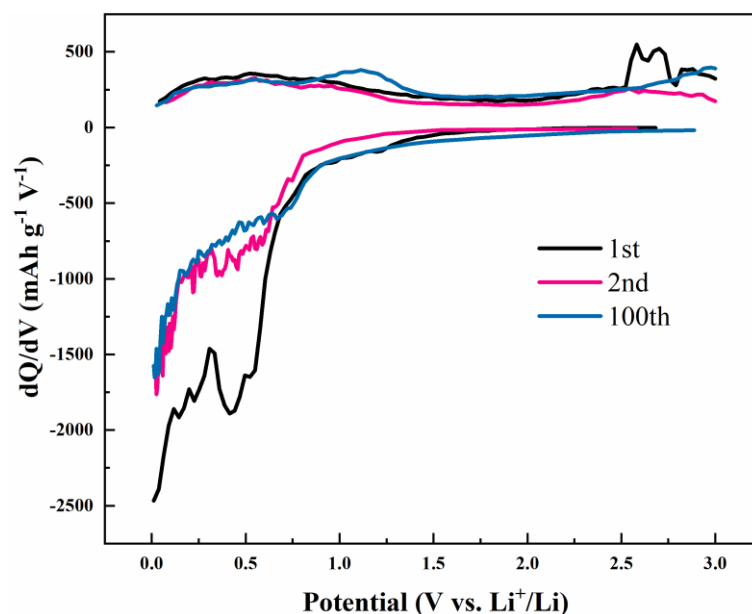


Figure S3. dQ/dV curve of ZnO/ZnFe₂O₄/NC

The differential capacity diagram (dQ/dV) is shown in Figure S3. For ZnO/ZnFe₂O₄/NC samples, it is evident that the trend is similar to the CV cycle. Except for the first cycle, the subsequent cycles basically overlap, indicating that a Li⁺ storage reaction occurred in the first cycle. During the first cycle of ZnO/ZnFe₂O₄/NC (Figure 4a in the main text), the cathodic peaks at approximately 0.64 and 0.35V can be attributed to the decomposition of ZnO and ZnFe₂O₄ to form Zn⁰ and Fe⁰.