

# Ni/Fe Saponite: A New High-Performance Anode for Lithium Ion Batteries Combining Si-based Anodes and Metal Oxides

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*NiFe saponite (NF-SAP) with Na<sup>+</sup> pillaring was investigated for the first time, as a high performance anode for lithium ion batteries. In this material, non-metallic element Si and metallic elements Fe, Ni all act as active components (providing specific capacity).*

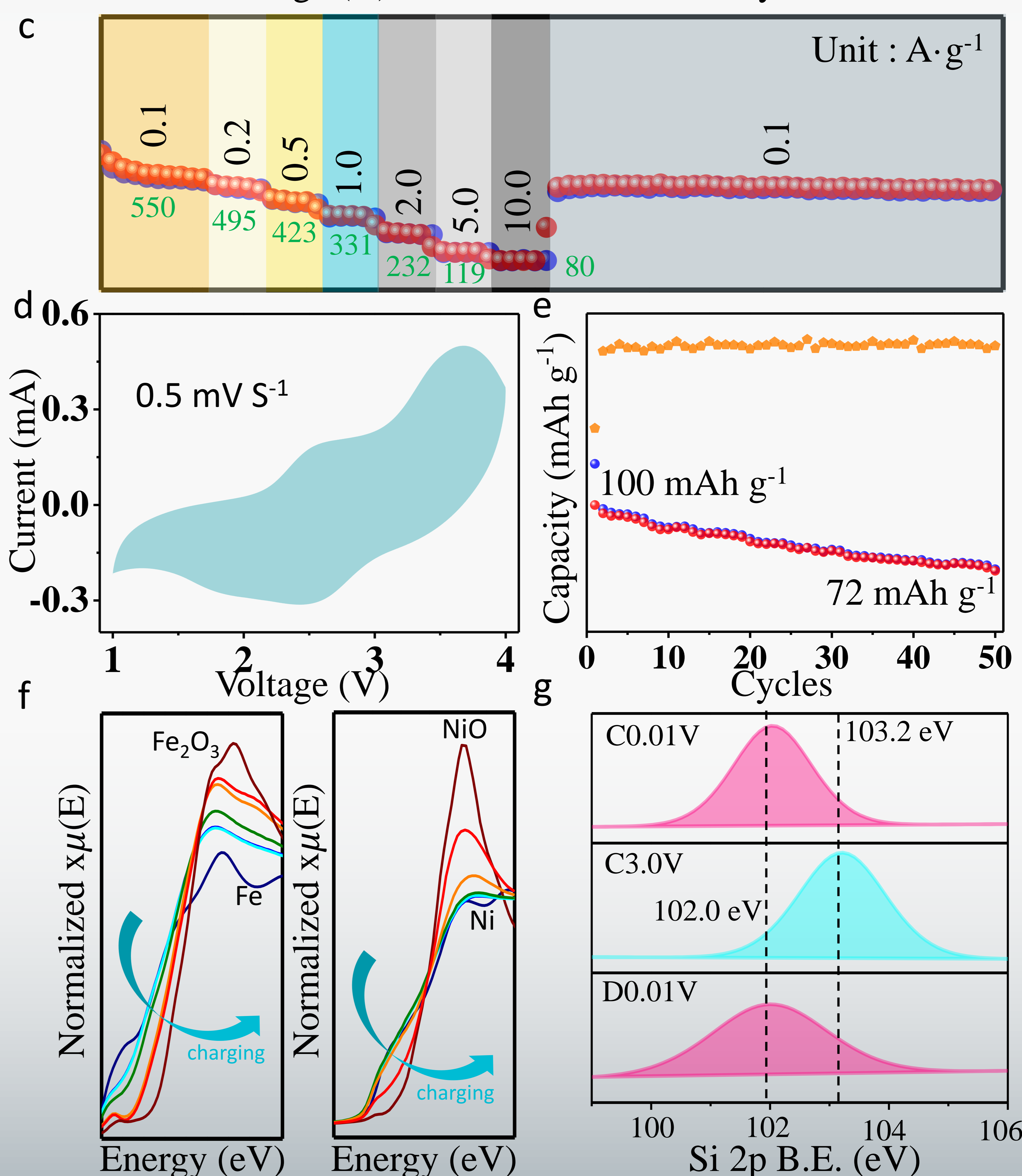
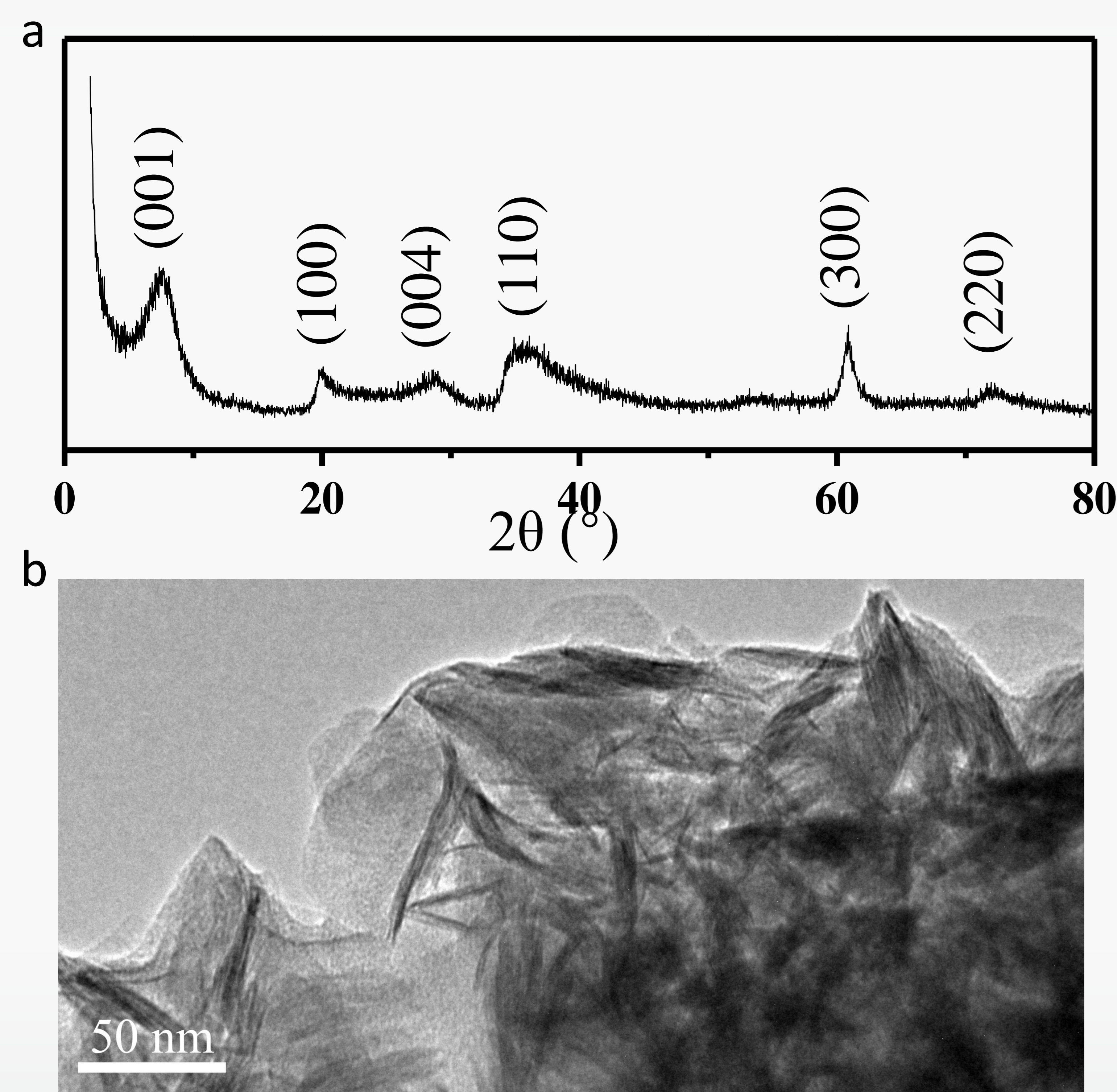
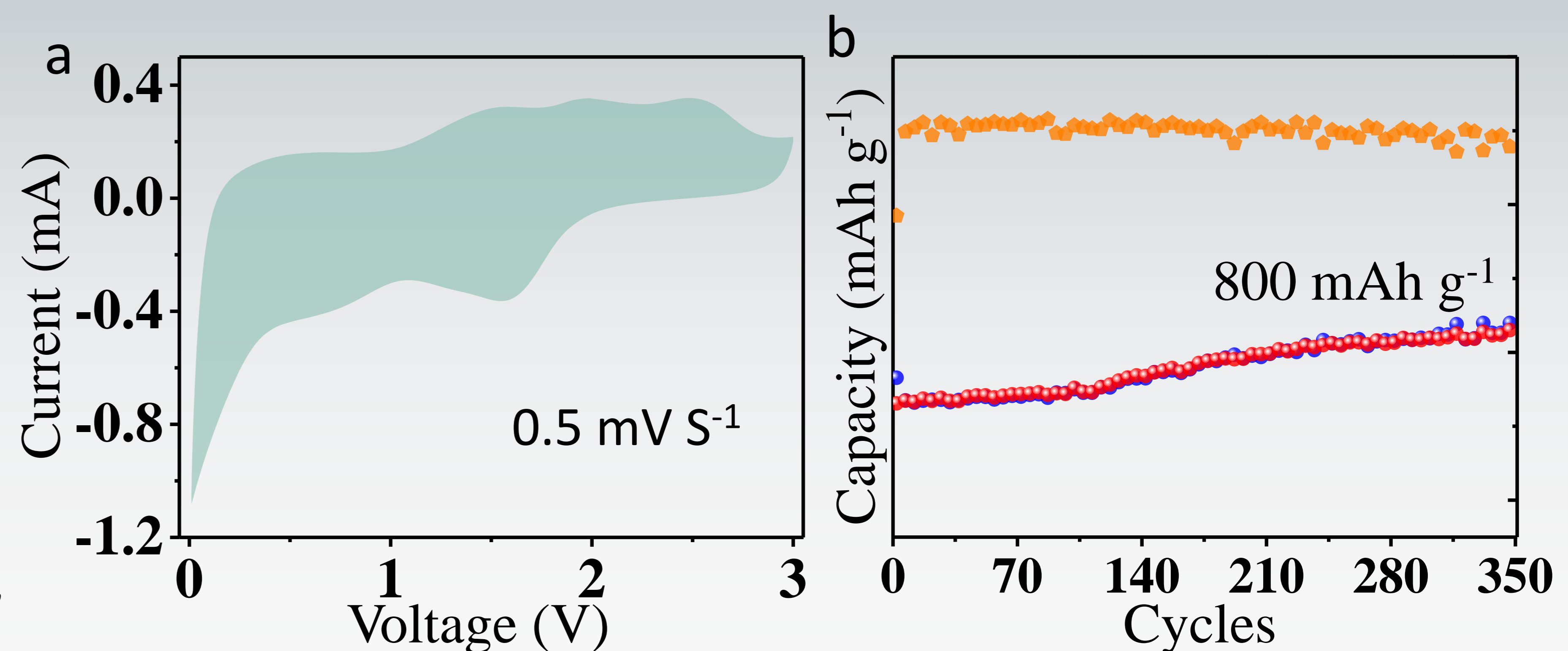


Fig. 1 (a) XRD pattern, (b) TEM image of NF-SAP.

### Conclusion:

- (1) The NF-SAP/Li half cell exhibits a high performance for Li<sup>+</sup> storage.
- (2) The active components include non-metallic element Si and metallic elements Fe, Ni.
- (3) The NF-SAP can be used as anode of sodium or potassium ion batteries after modification.

Fig. 2 (a) CV curve of NF-SAP. (b) Cycling performance of NF-SAP/Li half cell. (c) Rate performance of NF-SAP/Li half cell. (d) CV curve of LiMn<sub>2</sub>O<sub>4</sub>/NF-SAP full cell. (e) Cycling performance of the full cell. (f) XANES of Fe and Ni. (g) XPS spectra of Si.