

Supplemental Information

**A low cost and green preparation process of α -Fe₂O₃ @gum
arabic electrode for high performance sodium ion battery**

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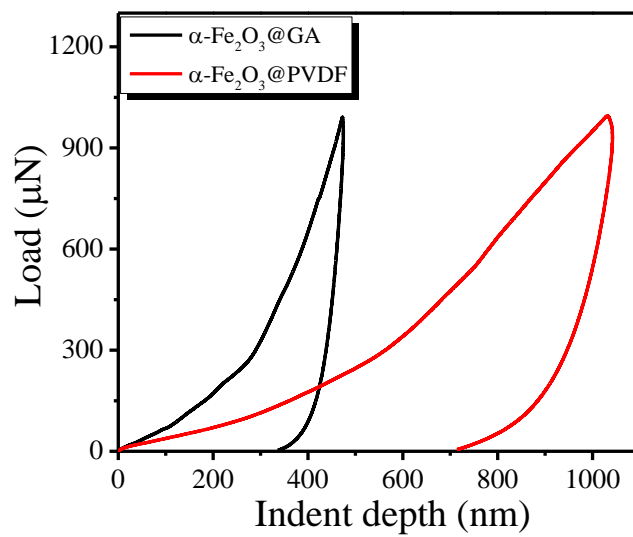


Fig. S1 Nanoscratch and indentation tests for α -Fe₂O₃@GA and α -Fe₂O₃@PVDF electrodes with the force of 1000 μ N.

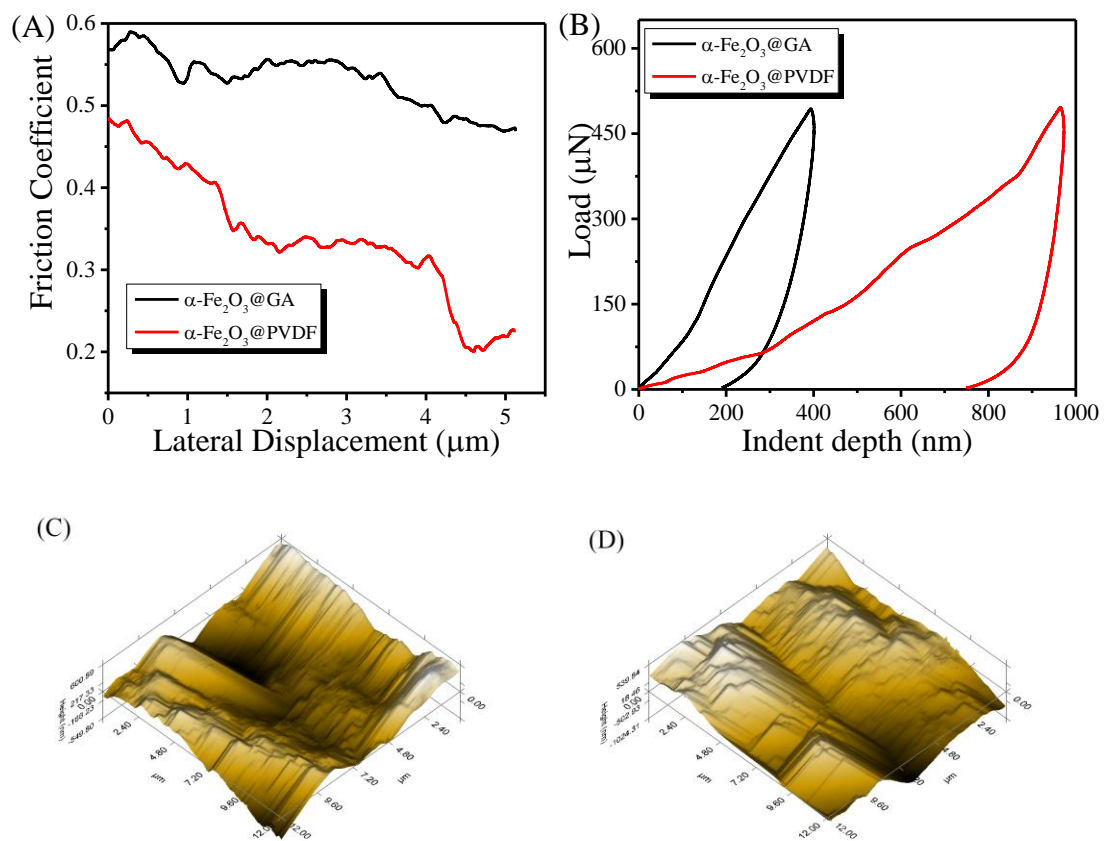


Fig. S2 Nanoscratch tests (A) and nanoindentation tests (B) for $\alpha\text{-Fe}_2\text{O}_3$ @GA and $\alpha\text{-Fe}_2\text{O}_3$ @PVDF electrodes after electrolyte uptake; 3D in-situ nanoscratch image of $\alpha\text{-Fe}_2\text{O}_3$ @GA (C) and $\alpha\text{-Fe}_2\text{O}_3$ @PVDF (D) electrodes after electrolyte uptake by nanoscratch tests.

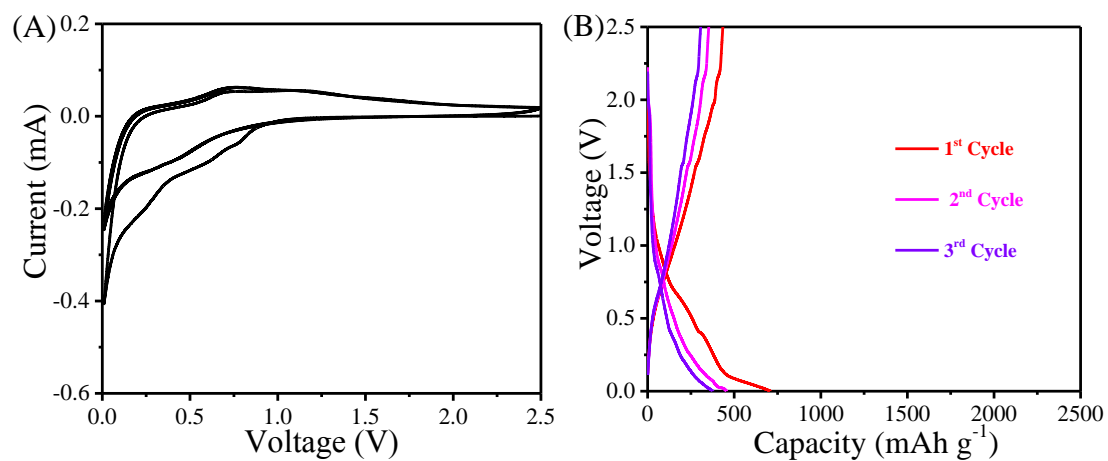


Fig. S3 (A) Cyclic voltammetry curves of the $\alpha\text{-Fe}_2\text{O}_3\text{@PVDF}$ electrodes; and (B) voltage capacity profiles of the $\alpha\text{-Fe}_2\text{O}_3\text{@PVDF}$ electrodes at a current density of 0.2 A g^{-1} .

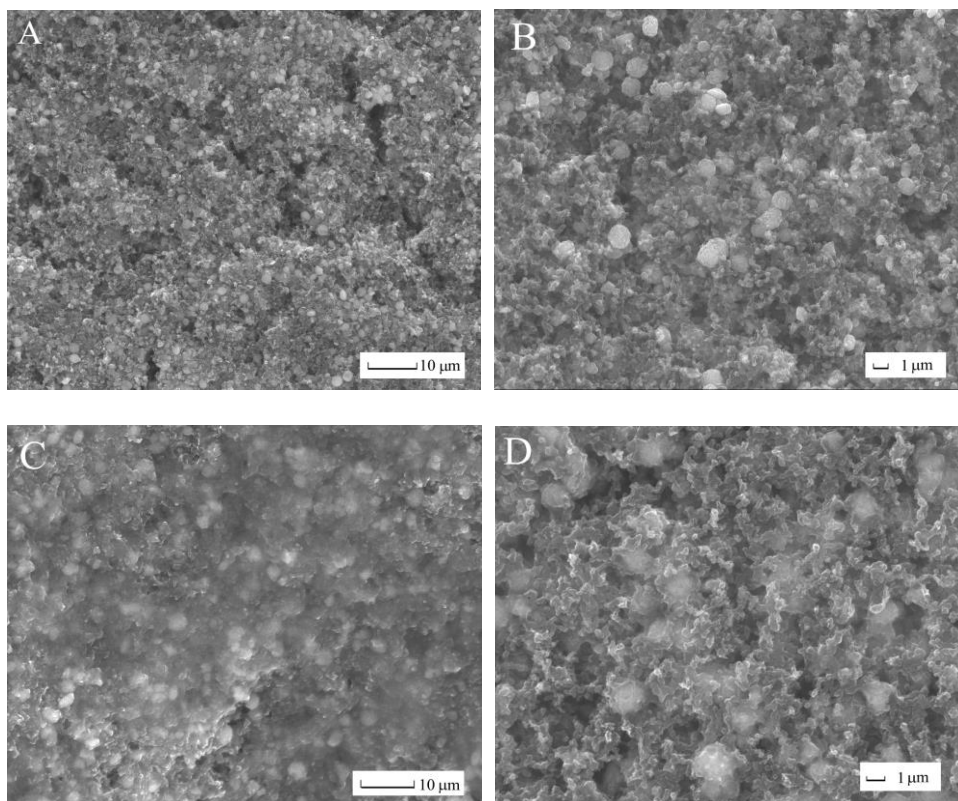


Fig. S4 SEM images of the α -Fe₂O₃@GA electrode before (A,B) and after (C,D) 500 cycles.

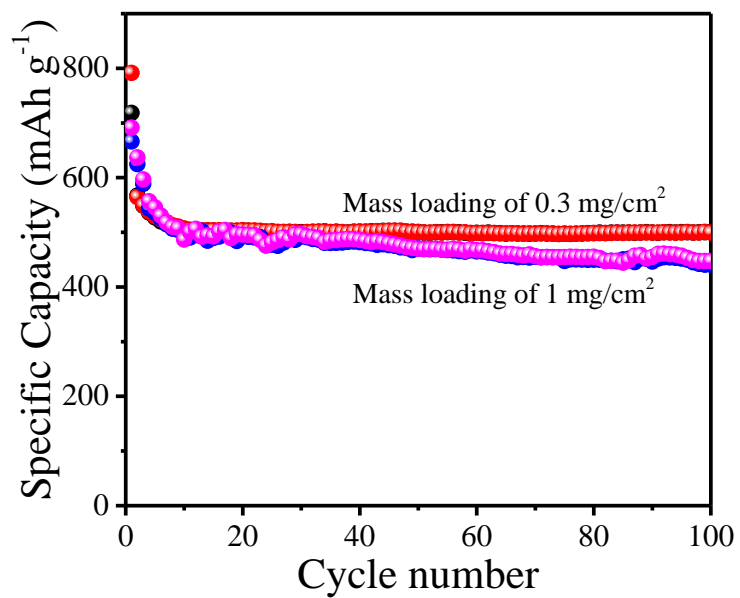


Fig. S5 Cyclic performance of the α -Fe₂O₃@GA electrode at different mass loading.

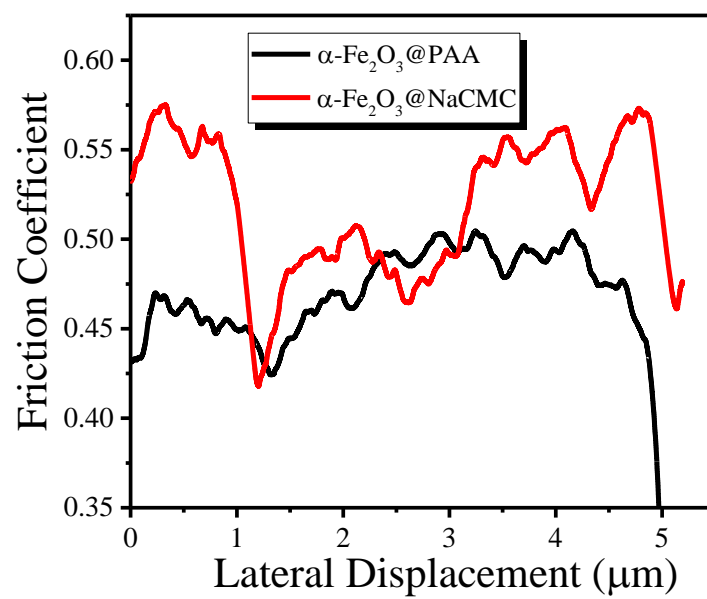


Fig. S6 Nanoscratch tests for $\alpha\text{-Fe}_2\text{O}_3\text{@PAA}$ and $\alpha\text{-Fe}_2\text{O}_3\text{@NaCMC}$ electrodes

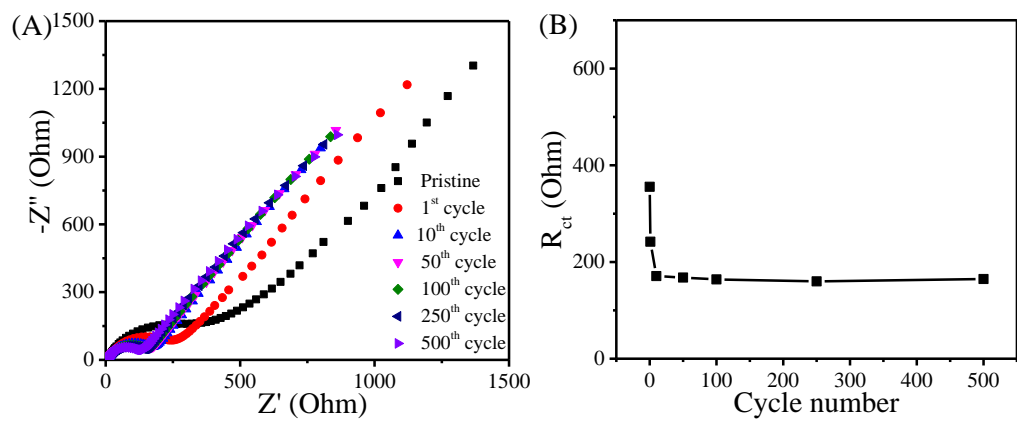


Fig. S7 EIS of the α -Fe₂O₃@GA electrode after different cycles.

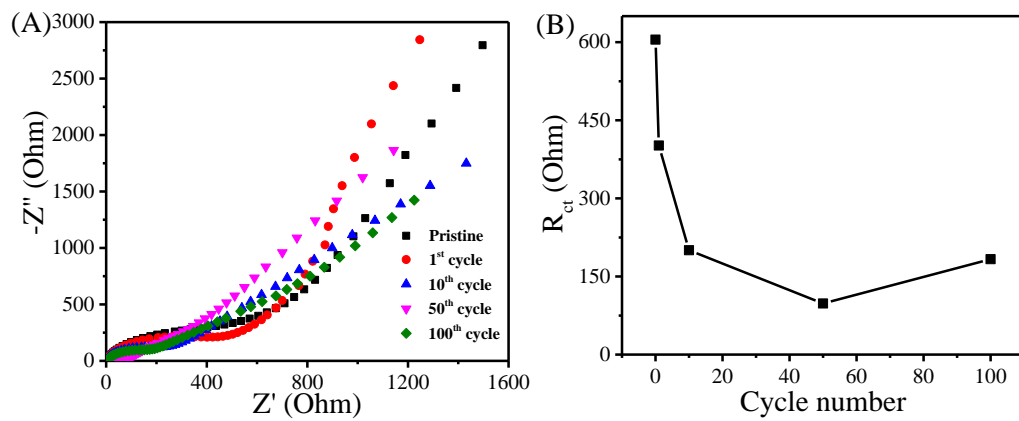


Fig. S8 EIS of the α -Fe₂O₃@PVDF electrode after different cycles.