

## Electronic Supplementary Information (ESI)

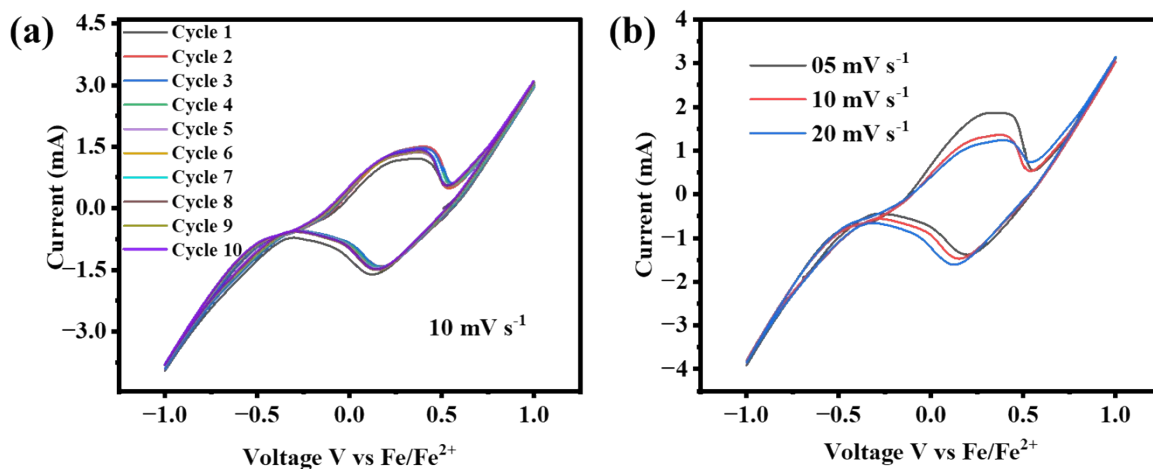
### **Ultrafast Charging/Discharging and Highly Stable Non-Aqueous Iron-Ion Batteries using Iron oxide (Fe<sub>3</sub>O<sub>4</sub>) Microspheres as Efficient Cathode Material**

Jitendra Kumar Yadav, Bharti Rani, Priyanka Saini, Anant Prakash Pandey and Ambesh Dixit\*

Advanced-Materials and Device (A-MAD) Laboratory, Department of Physics, Indian Institute of Technology Jodhpur, Jodhpur, Rajasthan 342030, India

\*Corresponding author – [ambesh@iitj.ac.in](mailto:ambesh@iitj.ac.in)

**Supplementary material**



**Figure S1:** The cyclic voltammetry plots for the reversible electroplating/stripping process of the  $\text{Fe}^{2+}$  ions (a) starting 10 cycles at  $10 \text{ mV s}^{-1}$  (b) starting cycles at a scan rate of the  $05 \text{ mV s}^{-1}$ ,  $10 \text{ mV s}^{-1}$ , and  $20 \text{ mV s}^{-1}$

**Table S1:** Different component values of the equivalent circuit fitted after the different GCD cycles of the Nyquist plot

No. of cycles (GCD Cycles)	$R_b$ ( $\Omega$ )	$R_{SEI}$ ( $\Omega$ )	$R_{CT}$ ( $k\Omega$ )	$C_{SEI}$ ( $\mu\text{F}$ )	$C_{CT}$ ( $\mu\text{F}$ )	CPE ( $\mu\text{Mho}$ )	$\xi^2$
Before 1 <sup>st</sup>	53.8	5.31	1.01	29.9	110	293	0.02
After 150 <sup>th</sup>	80.3	333	1.12	952	1020	737	0.02
After 300 <sup>th</sup>	116	1.18 k	1.78	835	523	281	0.1
After 500 <sup>th</sup>	201	2.07 k	1.92	1240	396	278	0.07