## **Electronic Supplementary Information**

## Critical Advances for the Iron Molten Air Battery: A New Lowest

## Temperature, Rechargeable, Ternary Electrolyte Domain

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**Fig.S1** TG/DTA of  $Fe_2O_3$  and NaOH mix for confirmation of the reaction of  $Fe_2O_3$  with molten NaOH to form  $H_2O$  and NaFeO<sub>2</sub>.



**Fig.S2** XRD analysis of  $Fe_2O_3$  and NaOH mix and pure  $Fe_2O_3$ . XRD analysis is conducted at a sweep rate of 0.2 degree per minute on a Rigaku D/MAX-2200 diffractometer and analyzed with the Jade software package (MDI Jade 5.0, Materials Data, Inc.).