Electronic Supplementary Information (ESI)

**Figure S1.** Schematic illustration for the synthesis of α-Fe₂O₃ MSHSs.
Figure S2. SEM images of the iron (III) citrate-sucrose composite.
Figure S3. XRD pattern of the iron (III) citrate-sucrose composite. Only the diffraction peaks from the holder can be detected, demonstrating the amorphous nature of the iron (III) citrate-sucrose composite.
Figure S4. TGA curves for as-synthesised Sample 1 ($x = 0.5$), 2 ($x = 0$), 5 ($x = 1.0$), 6 ($x = 1.5$) and 7 ($x = 2.0$).
Figure S5. Solid content of as-synthesised samples as a function of \( x \) (sucrose/iron citrate ratio).
Figure S6. Nitrogen adsorption-desorption isotherms and pore size distributions of selected samples (Sample 1 ($x = 0.5$), Sample 2 ($x = 0$), Sample 5 ($x = 1.0$), Sample 6 ($x = 1.5$) and Sample 7 ($x = 2.0$)).
Figure S7. Coulombic Efficiency vs. cycle number.
Figure S8. SEM images of Sample 8 (randomly aggregated α-Fe$_2$O$_3$ nanoparticles).
Figure S9. Cycling performance of Sample 8 (randomly aggregated α-Fe₂O₃ nanoparticles) at a current density of 200 mA g⁻¹.