Dextran Stabilised Hematite: a sustainable anode in Aqueous Electrolytes

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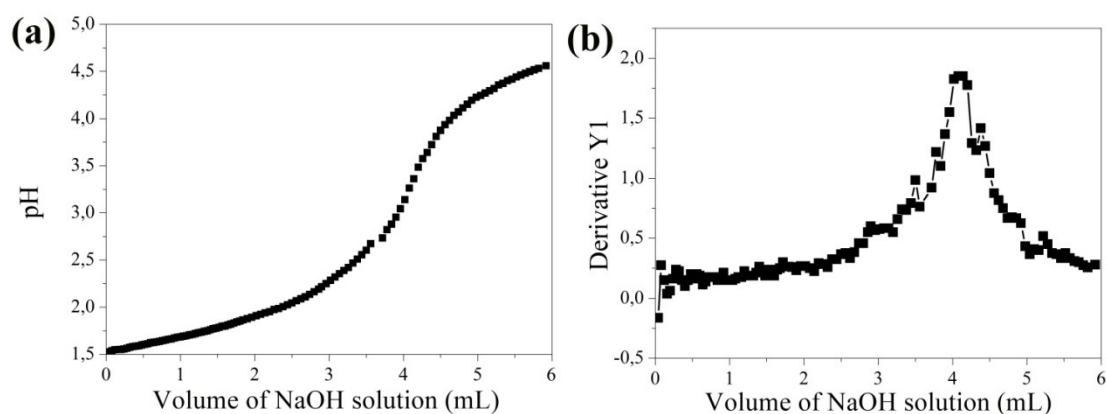
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Fig. S1. Potentiometric titration curve of Ox-Dex (a) and first derivative of the titration curve (b).

Oxidation degree (%):

$$\frac{\dfrac{Mw\ of\ oxidized\ dextran\ repeat\ unit * V_{NaOH} * C_{NaOH} * 10^{-3}}{mass\ of\ oxidized\ dextran}}{2} \qquad \text{S1}$$

where V_{NaOH} is the consumed volume of NaOH solution (mL), C_{NaOH} is the concentration of NaOH solution in mol/L and the Mw of oxidized dextran repeat unit is 198,11 g/mol.
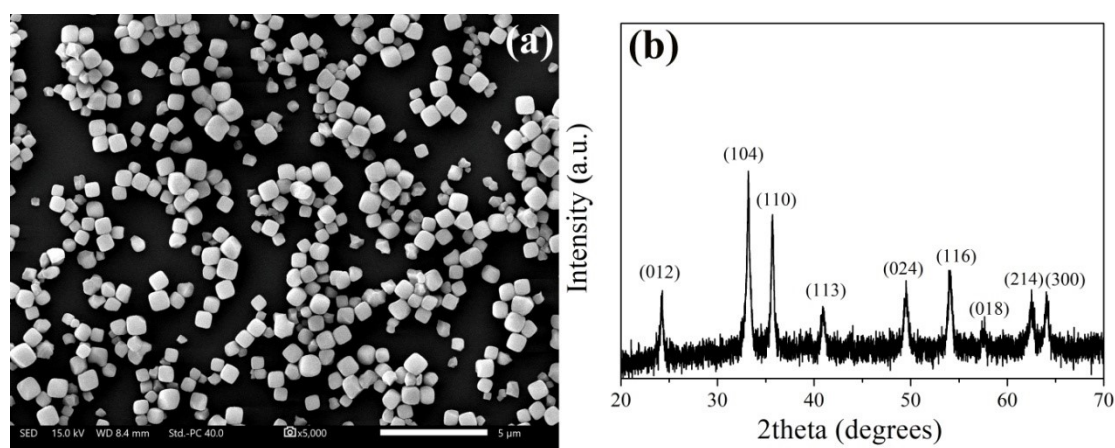

Fig. S2. FE-SEM image (a) and XRD pattern (b) of the α-Fe$_2$O$_3$ particles.

$$D = \frac{K\lambda}{\beta cos\Theta} \qquad \text{S2}$$

where D is the crystalline size, K denotes the Scherrer constant (0.98), λ corresponds to the X-ray wavelength, β denotes the full width at half maximum (FWHM) and θ refers to the Bragg angle of the peak.

Fig. S3. Oxidation of the copper substrate (left), loss of material in the aqueous electrolyte (middle) due to electrolysis (right) on the surface of the bare α-Fe_2O_3 electrode in Li_2SO_4.
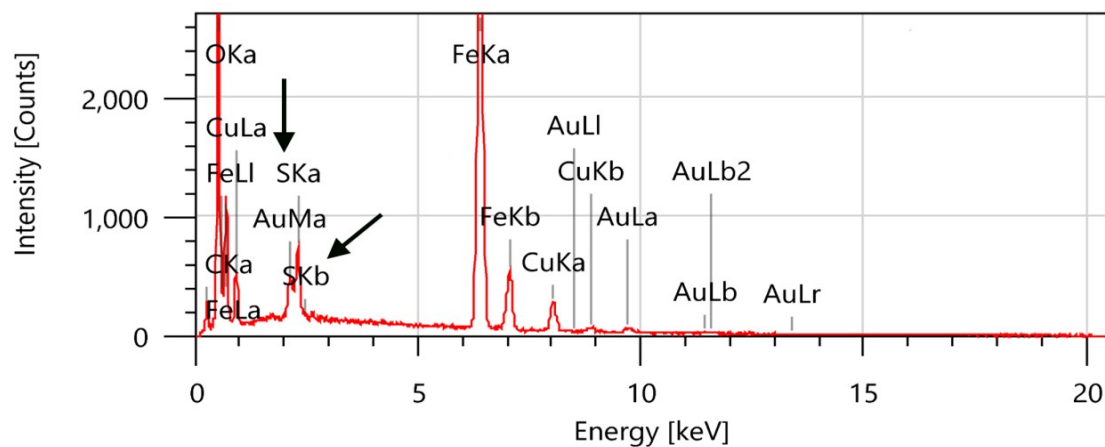

Fig. S4. EDS analysis of the hybrid α-Fe_2O_3/Ox-Dex electrode after 100 continuous intercalation/deintercalation scans in 1 M $ZnSO_4$ electrolyte solution.