Supporting Information

Micron iron oxides functionalized with hydrophobic mesoporous sheets for Ni-Fe battery

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Figure S1 The water contact angle measurement of industrial Fe_3O_4-por after cycling test

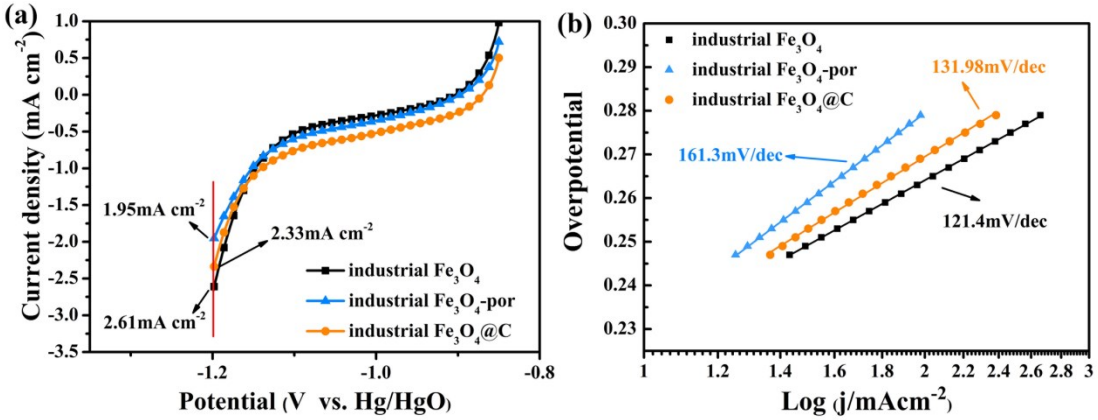

Figure S2 (a)Polarization curves of industrial Fe_3O_4, industrial Fe_3O_4-por and industrial Fe_3O_4@C. (b) corresponding Tafel plots derived from (a).

Owing to that the reduction reaction of Fe_3O_4 electrodes and hydrogen evolution reaction may occur at the same potential, the polarization curves were measured after Fe_3O_4 electrodes were fully charged to eliminate the possible effect of the reduction reaction. The Tafel slopes of industrial Fe_3O_4, industrial Fe_3O_4-por and industrial Fe_3O_4@C is 121.4mv/dec, 161.3mv/dec and 131.98mv/dec, respectively. At -1.2V (vs. Hg/HgO), the current density of hydrogen evolution on industrial Fe_3O_4, industrial Fe_3O_4-por and industrial Fe_3O_4@C is 2.61 mA/cm^2, 1.95 mA/cm^2 and 2.33 mA/cm^2, respectively. The Tafel slope of industrial Fe$_3$O4 is larger than other two electrodes but its current density of hydrogen evolution does not decrease much. The results indicate that hydrophobic mesoporous Fe_3O_4 sheets can inhibit hydrogen evolution but not effectively. The slight inhibition of hydrogen evolution is not the vital factor that influences anode performance.