Electronic Supplementary Information

\(\gamma\)-Fe\(_2\)O\(_3\) nanoparticles encaptulated in polypyrrole for solid-state lithium batteries

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Figure S1. FT-IR pattern of $\gamma$-Fe$_2$O$_3$-PPy core-shell.

Figure S2. TGA curve of $\gamma$-Fe$_2$O$_3$-PPy core-shell.
Figure S3. SEM image of $\gamma$-Fe$_2$O$_3$-PPy core-shell.

Figure S4. Initial charge-discharge volumetric capacities of Li/GPE/PPy-Fe$_2$O$_3$ cells at different current densities (0.1 and 1 C-rate, RT).
**Figure S5.** Cycle performance and cumbic efficiency of Li/GPE/PPy-Fe$_2$O$_3$ cells at 0.1C-rate (Room temperature).

**Figure S6.** Cycle performance of nano sized γ-Fe$_2$O$_3$ cell at 0.1C-rate (Room temperature).
**Figure S7.** Initial charge-discharge capacity of Li/PPy-Fe$_2$O$_3$ cells with liquid electrolyte (0.1 C-rate, RT).