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Supporting Information

One-pot self-assembly of three-dimensional graphene macroassemblies with porous core and layered shell

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I. XPS spectrum of the formed macroassembly

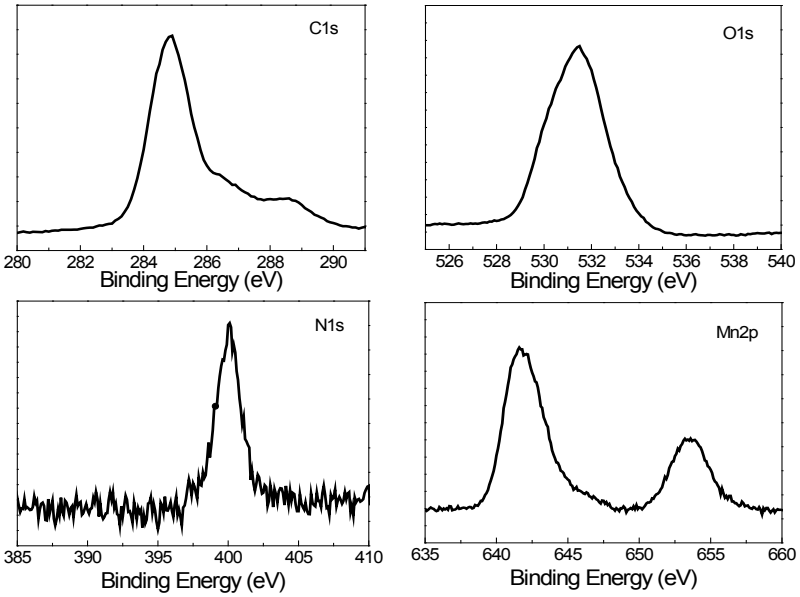

Figure S1. Typical XPS spectra for a CSGM constituted with reduced graphene sheets (in the preparation, the concentrations of GO and $KMnO_4$ are 2 mg/ mL and 0.36 mg/mL respectively, and we denote the as-prepared CSGM as CSGM-B in the following tests). The C_{1s} spectrum indicates that graphitic carbon is dominant and only low concentration of oxygen containing group is bonded to carbons.

II. EDS analysis for the core and shell

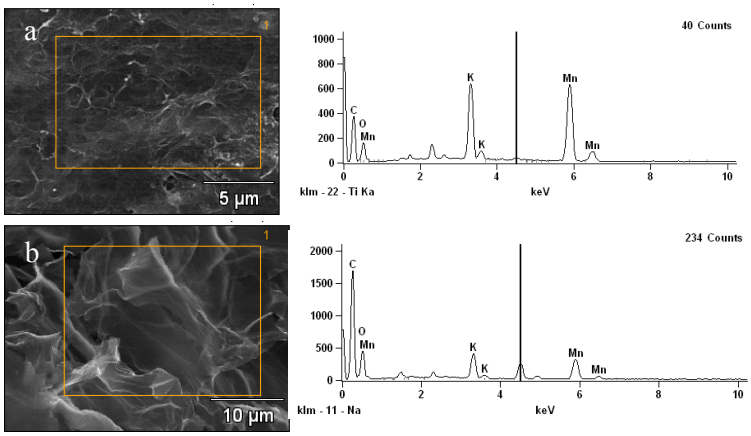

Figure S2. EDS spectra of the shell and core separated from the CSGM-B. (a): shell and (b): core. From the EDS analyses, we can identify the differences of composition of core and shell clearly. The element analysis shows the Mn containing in the shell is about 17 wt%, while in the core it is only about 2 wt%. The K element derived from the $KMnO_4$ is also mainly adsorbed on the shell.

III. TG profile of the core and shell

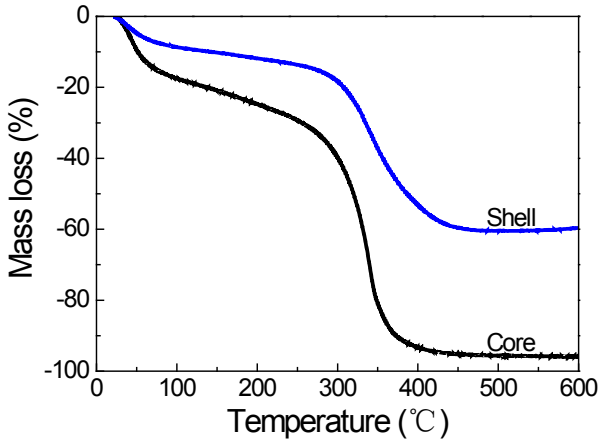

Figure S3. TG profiles of CSGM-B performed in air atmosphere. The residual ratio of core after C element was burnt out is only 3 wt% which corresponds to the EDS analysis, while the residual ratio of shell is about 40 wt% due to existence of residual K and Mn element.

IV. XRD pattens of the core and shell

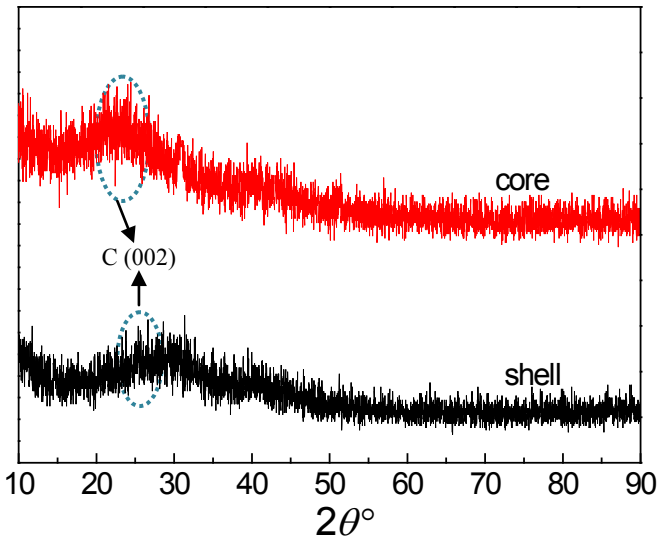

Figure S4. XRD patterns of shell and core separated from CSGM-B. The XRD patterns show broadened and small peaks appeared around 24 and 26° for the core and shell respectively suggesting the existence of partly stacked graphene sheets with different interlayer spacing, and the shell has a more tightly stacking structure than the core.