Supporting Information

Versatile Porous Graphene Flakes Derived by Alkali Metal Carbonates based Ultrafast and Sulfuric Acid-Free Solid-State Oxidation Reaction

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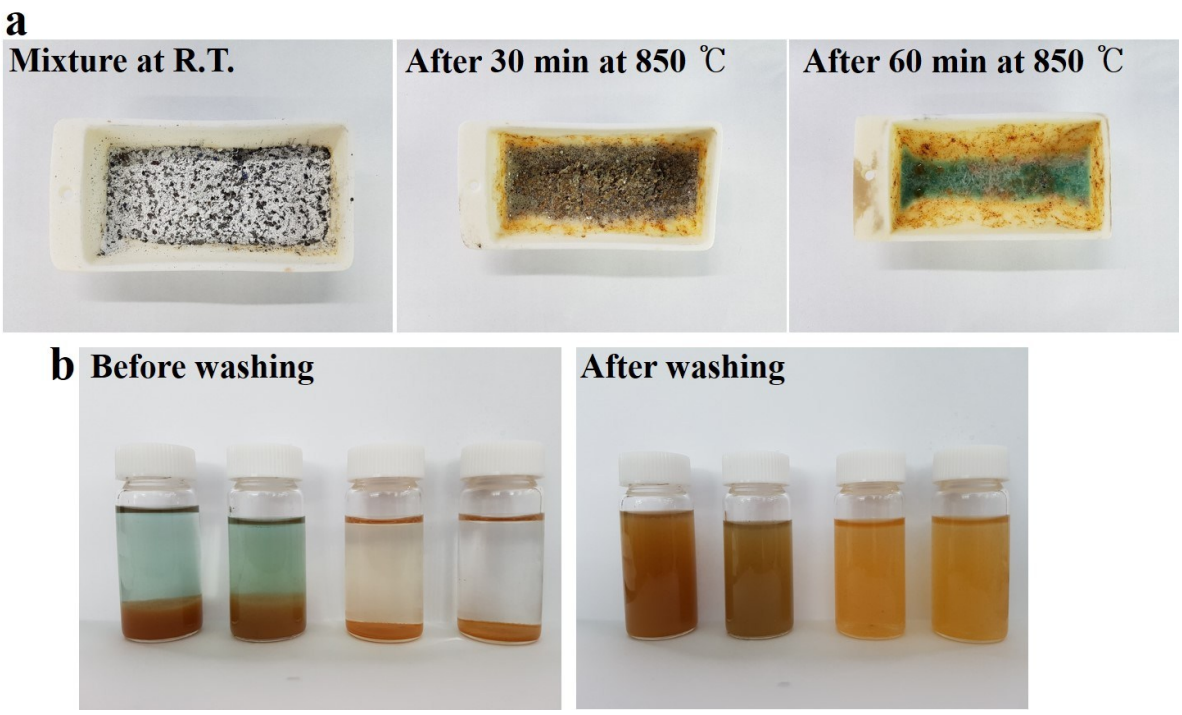

Figure S1. (a) Digital images of reaction time-dependent products. (b) Dispersibility of as-synthesized MSGO in water before and after washing with water and 1 wt.% HCl.

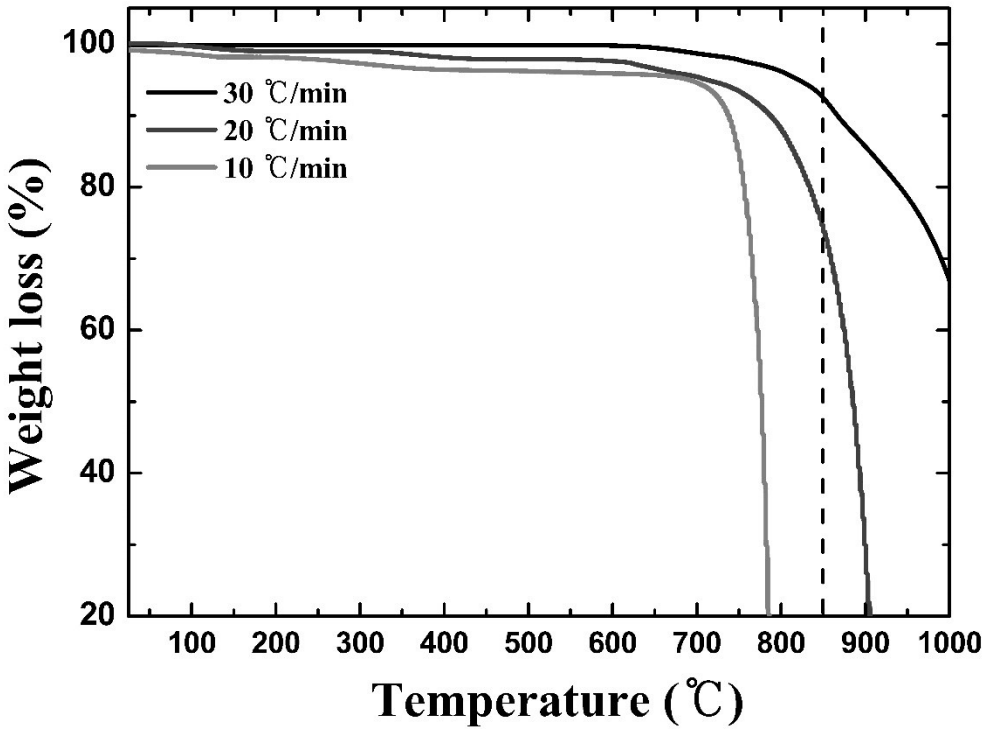

Figure S2. Thermal stability of graphite depends on heating rate

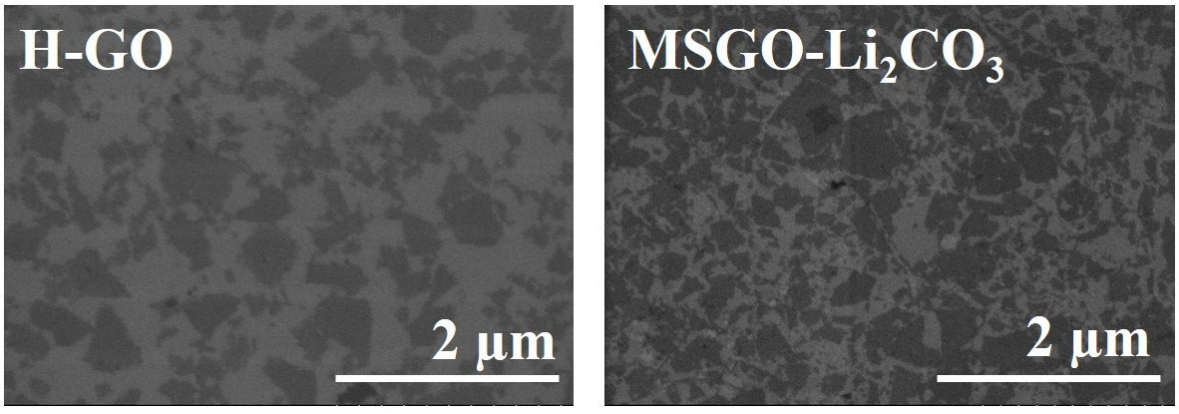

Figure S3. SEM images of H-GO (left) and MSGO (right).

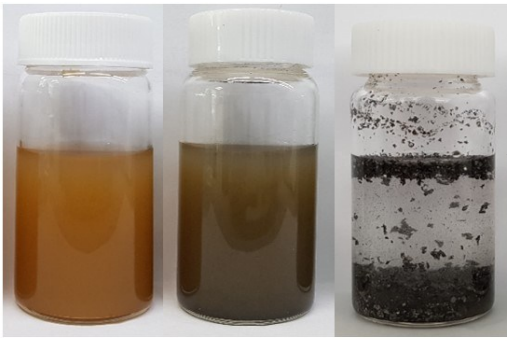

Figure S4. Alkali metal-dependent oxidation degree, indicating there is no oxidation behavior in K_2CO_3.

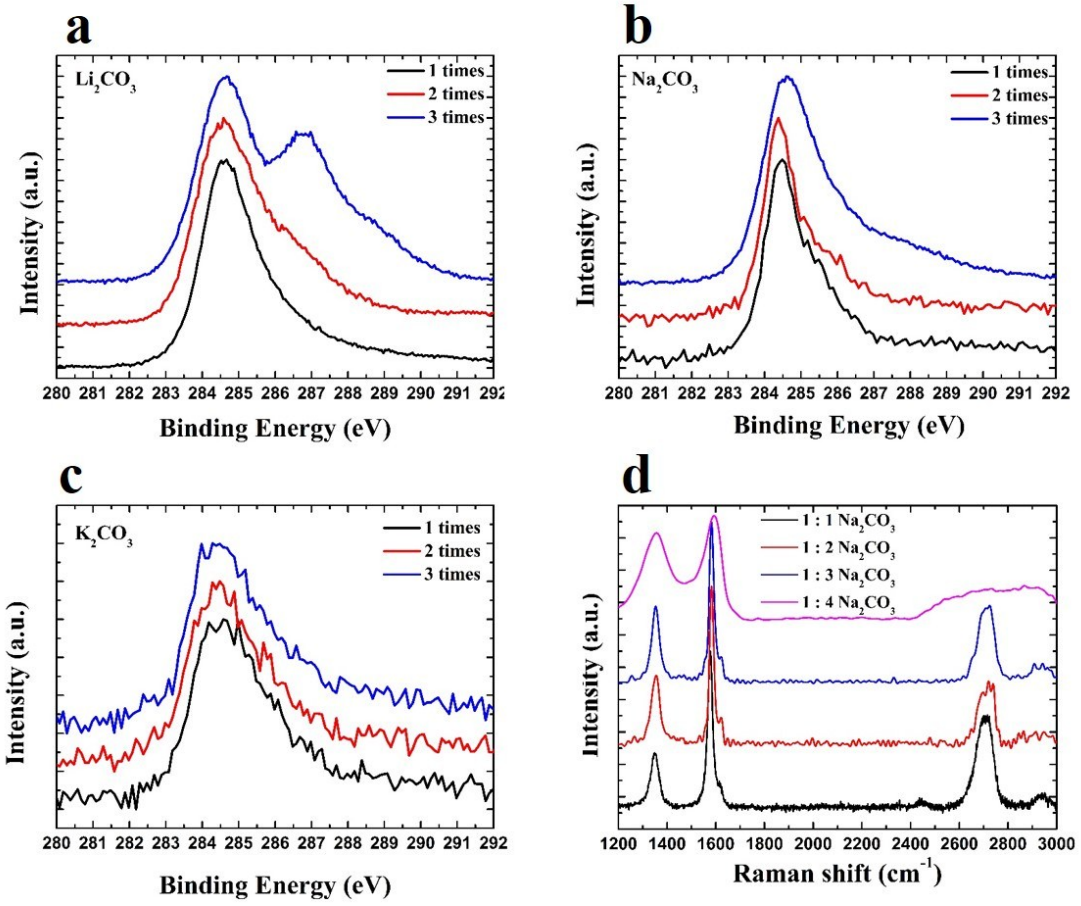

Figure S5. Ratio of M_2CO_3-dependent oxidation degree of MSGO, C 1s core level spectra. (a) Li_2CO_3, (b) Na_2CO_3, (c) K_2CO_3, and (d) Ratio of Na_2CO_3-dependent Raman spectroscopy.

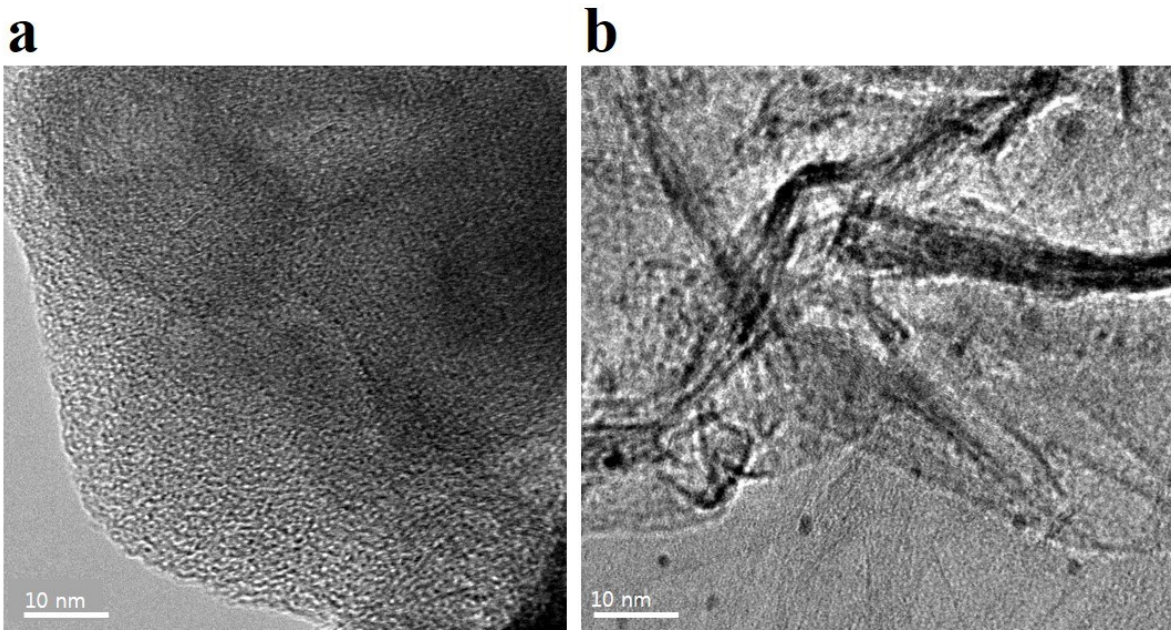

Figure S6. High-resolution TEM images. (a) MSGO showing no impurities on the surface after HCl treatment. (b) Li_2O particles can be observed on MSGO sheet before HCl treatment.

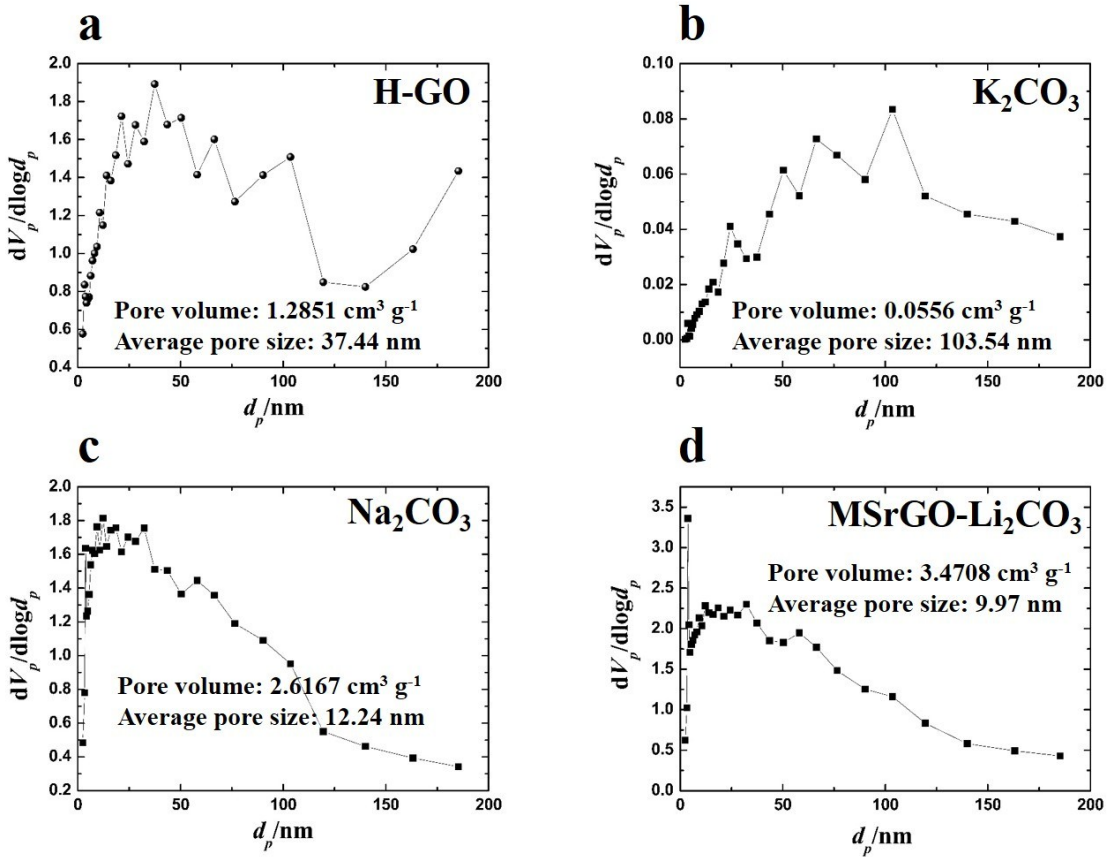

Figure S7. Pore size distribution of all samples.

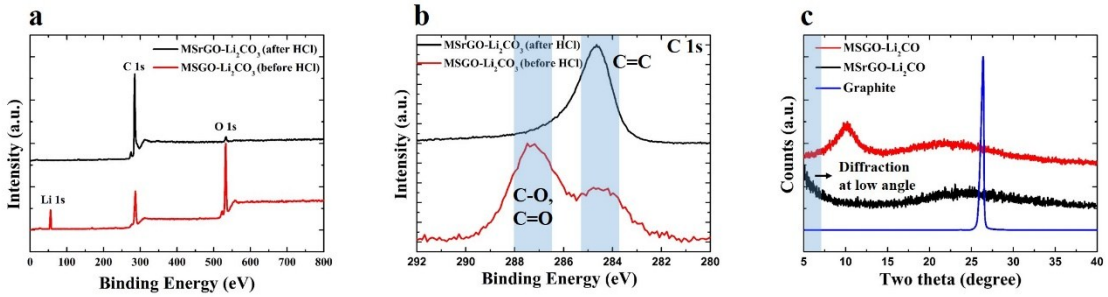

Figure S8. Chemical structures of thermal reduction of MSGO to MSrGO

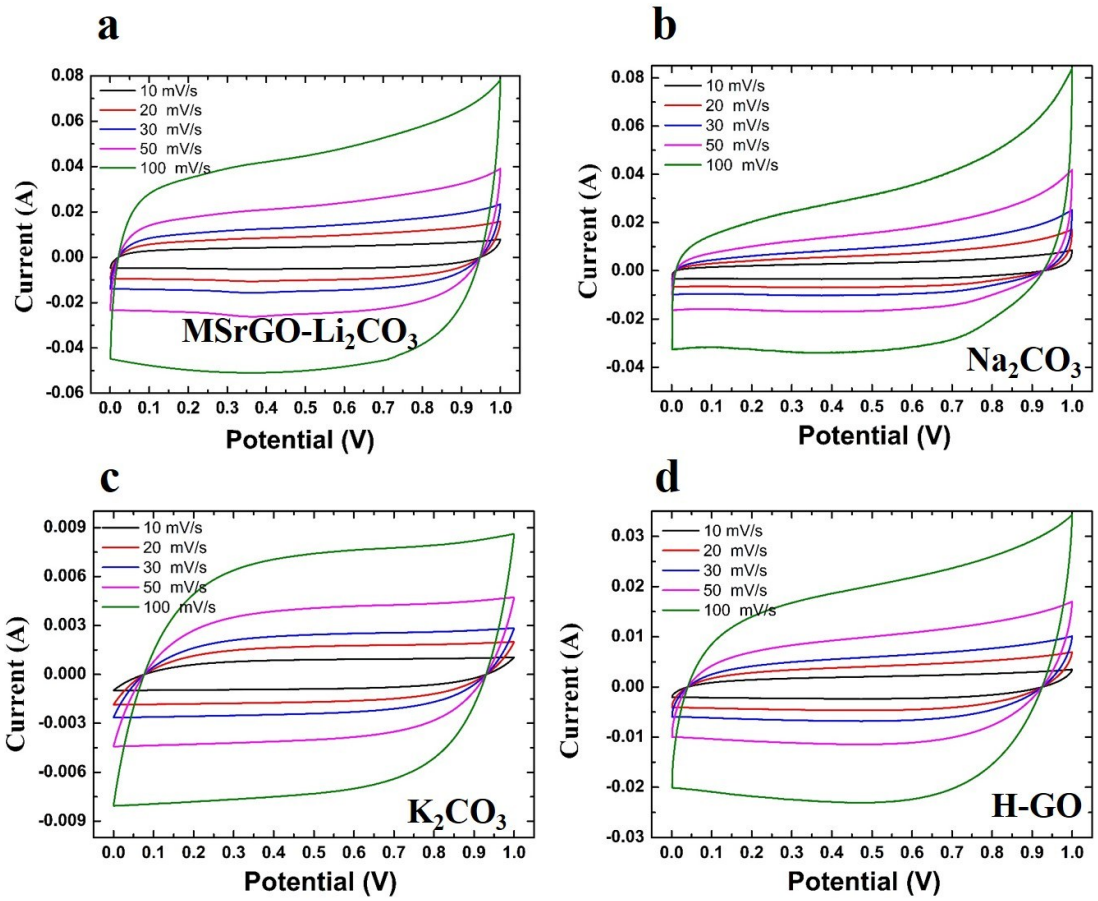

Figure S9. Cyclic voltammetry curves of all electrodes at scan rates from 10 to 100 mV s^{-1}. (a) Li_2CO_3, (b) Na_2CO_3, (c) K_2CO_3, and (d) H-GO.