Supporting Information

Pseudocapacitive Energy Storage and Electrocatalytic Hydrogen-Evolution Activity of Defect-Ordered Perovskites $Sr_xCa_{3-x}GaMn_2O_8$ (x = 0 and 1)

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Number of pages: 4

Number of figures: 3

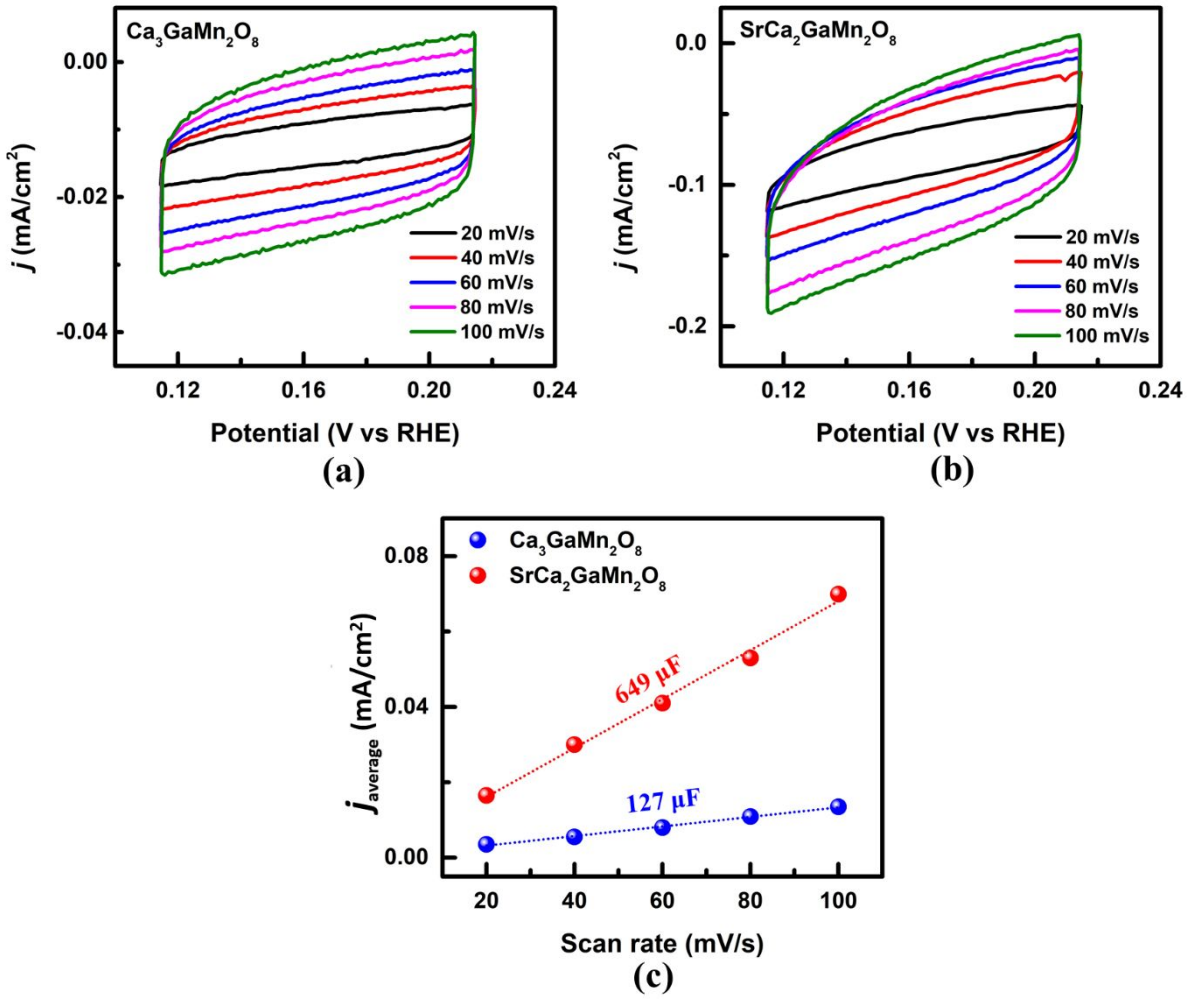

Figure S1. (a) and (b) Cyclic voltammetry data in non-faradic region for the two compounds. (c) Plot of $j_{average}$ versus scan rate (v). Here, $j_{average}$ is the average of j_{anodic} and $j_{cathodic}$ absolute values at the middle potential of the CV at each scan rate. The C_{dl} value is often taken as a measure of electrochemically active surface area (ECSA),[1] and is obtained from the slope of $j_{average}$ versus v graph according to the equation $C_{dl} = j_{average}/v$. [2-3]

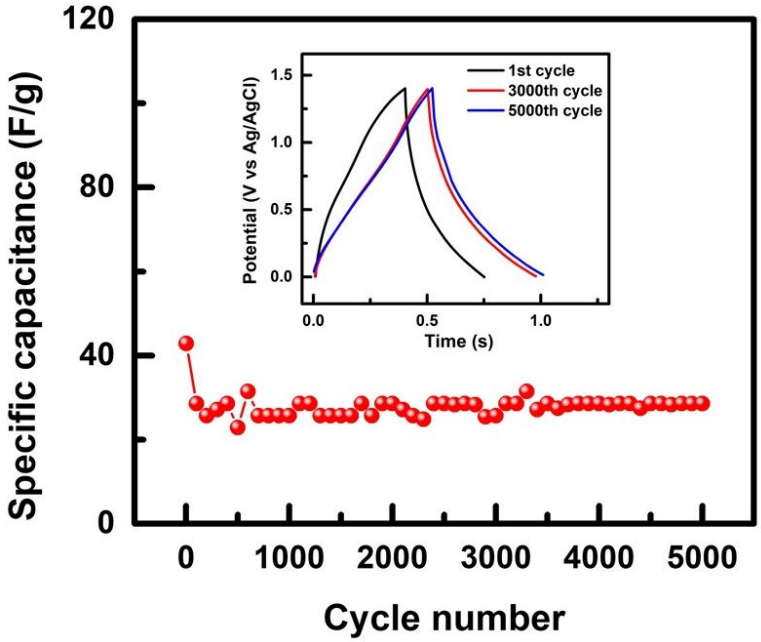

Figure S2. Specific capacitance obtained from 5000 GCD cycles for $Ca_3GaMn_2O_8$ at 10 A/g, indicating high stability. The inset shows the 1st, 3000th, and 5000th GCD cycles.

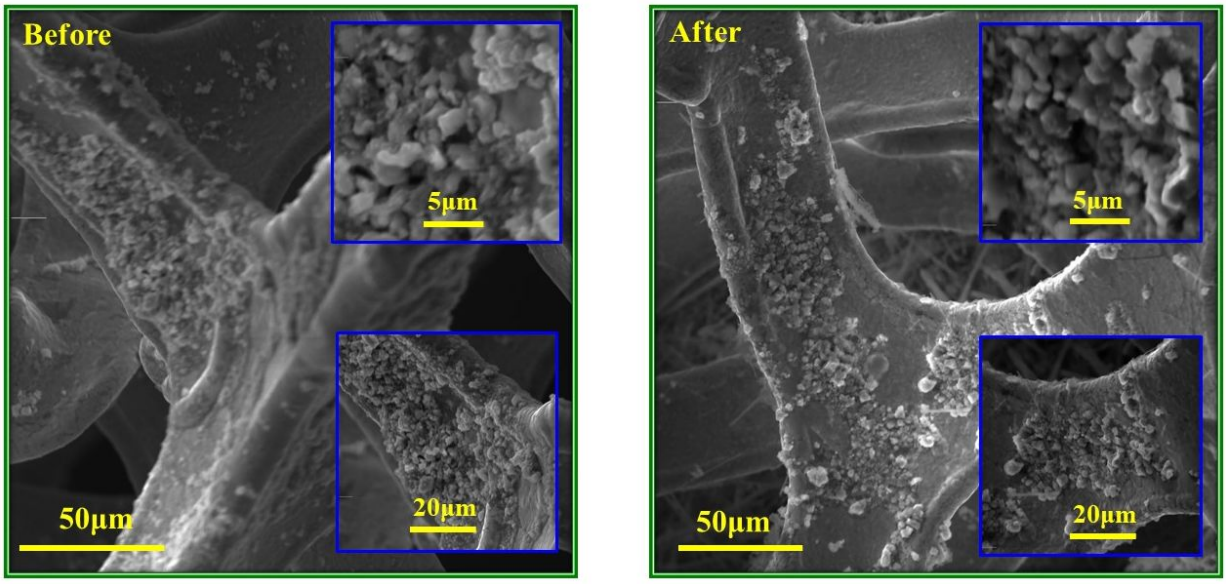

Figure S3. Scanning electron microscopy (SEM) images of $Ca_3GaMn_2O_8$ particles on nickel foam before and after 5000 GCD cycles.

1. Pan, Y.; Chen, Y.; Li, X.; Liu, Y.; Liu, C., Nanostructured nickel sulfides: phase evolution, characterization and electrocatalytic properties for the hydrogen evolution reaction. *RSC Adv.* **2015,** *5*, 104740-104749.
2. Hona, R. K.; Ramezanipour, F., Remarkable Oxygen-Evolution Activity of a Perovskite Oxide from the $Ca_{2-x}Sr_xFe_2O_{6-\delta}$ Series. *Angew. Chem.* **2019,** *58*, 2060-2063.
3. Hona, R. K.; Karki, S. B.; Ramezanipour, F., Oxide Electrocatalysts Based on Earth-Abundant Metals for Both Hydrogen- and Oxygen-Evolution Reactions. *ACS Sustainable Chem. Eng.* **2020,** *8*, 11549-11557.