Supporting information

Lithium storage of highly conductive Cu_3Ge boosted Ge/graphene aerogel

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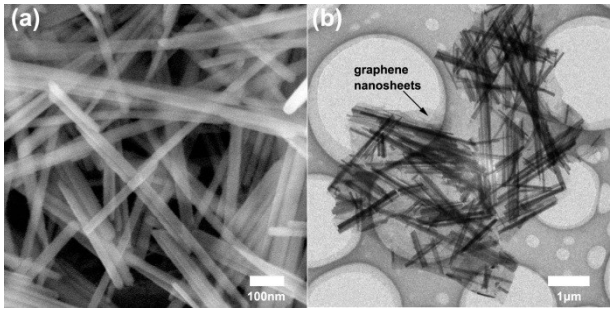

Fig. S1 (a) SEM images of $CuGeO_3$ NWs, (b) TEM image of $CuGeO_3$ NWs/G hydrogel.

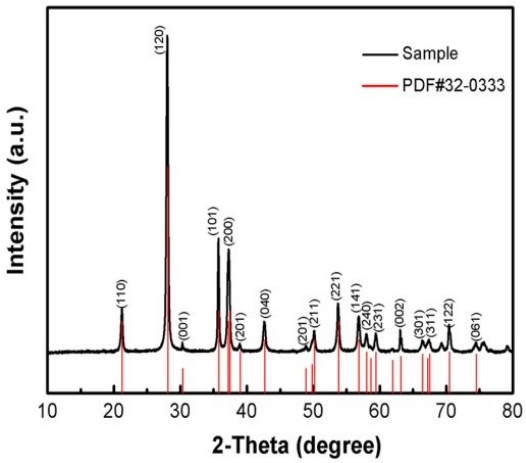

Fig. S2 XRD pattern of $CuGeO_3$ NWs/G hydrogel.

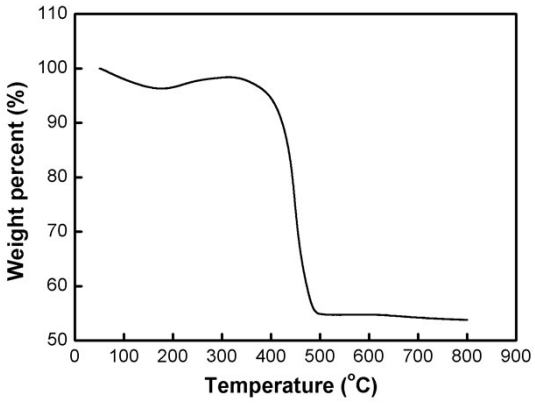

Fig. S3 TG curve of Cu_3Ge/Ge@G aerogel. The result shows that the composite contains 39.95 wt% Cu_3Ge/Ge and 60.05 wt% graphene based on the weight loss upon graphene combustion and that Cu_3Ge/Ge is fully oxidized to $CuGeO_3$ (CuO-GeO_2) in air. The weight loss that commences around 400 °C is caused by the graphene combustion reaction.

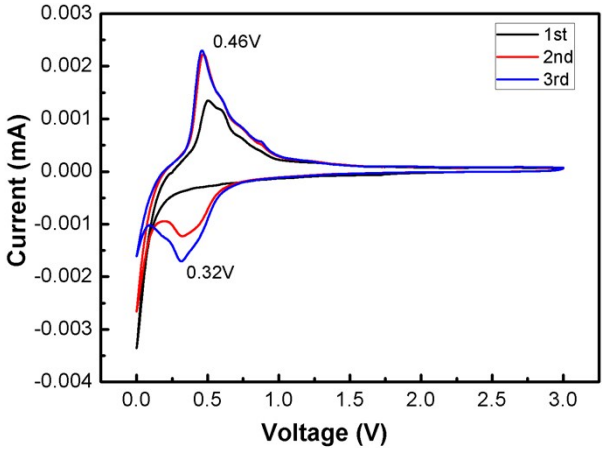

Fig. S4 Cyclic voltammograms of Cu_3Ge/Ge@G aerogel at a scanning rate of 0.2 mV s^{-1} from 0.005 to 3 V versus Li/Li^+

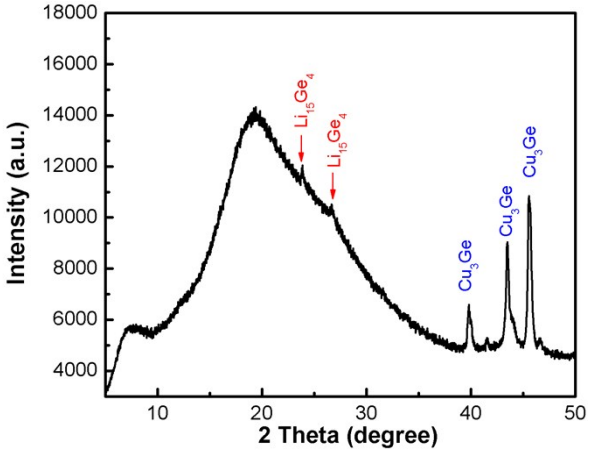

Fig. S5 Ex-situ XRD pattern of Cu_3Ge/Ge@G aerogel when lithiated to 5 mV. The hump located around 20 degree is associated to the signal of Kapton film for the test setup.

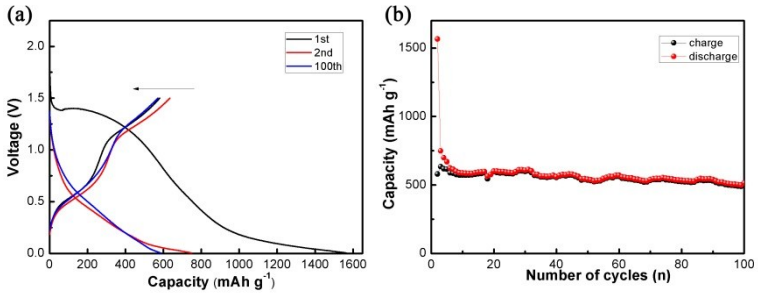

Fig. S6 Voltage profile (a) and cycling performance (b) of bare $CuGeO_3$ NWs a current density of 0.1 C.

Tab. S1 Equivalent circuit and corresponding fitted parameters of the EIS spectrum.

Equivalent circuit	Sample	R_s/Ω	R_1/Ω	R_{ct}/Ω
	Cu_3Ge/Ge@G as-assembled	6.2	16.2	98.7
	Cu_3Ge/Ge@G after 100 cycles	6.46	4.384	3.6
	Cu_3Ge/Ge as-assembled	9.285	18.95	140.2
	Cu_3Ge/Ge after 100 cycles	8.762	232	641.2

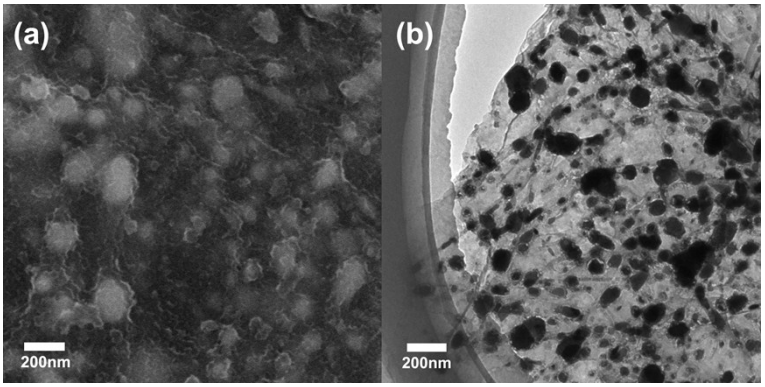

Fig. S7 SEM (a) and TEM (b) images of Cu_3Ge/Ge@G aerogel after cycled for 100 cycles at 0.1 C.