## Supporting Information

## Metal/graphene nanocomposites synthesized with aid of supercritical fluid for promoting hydrogen release from complex hydrides

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**Figure S1.** TEM bright-field images of Ni/GNS composites synthesized (a) without and (b) with SCCO<sub>2</sub>.



Figure S2. TPD signals of LiAlH<sub>4</sub> without and with 2.5 wt.% of various additives.



Figure S3. TEM micrographs of (a) Pd/GNS and (b) Au/GNS composites synthesized with SCCO<sub>2</sub>.



**Figure S4.** TPD signals of  $LiAlH_4$  without and with 2.5 wt.% of micron-scale Fe, Ni, Pd, and Au powder.



**Figure S5.** Pore size distribution of AC calculated from the nitrogen adsportion isotherm using a Barrett–Joyner–Halenda (BJH) method.



Figure S6. SEM micrographs of (a) AC, (b) CB, (c) CNTs, and (d) GNSs.