Electronic Supplementary Information

Nickel-decorated graphene nanoplates for enhanced H$_2$ sorption properties of magnesium hydride at moderate temperatures

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Fig. S1 SEM (a,b) and TEM (c) images of the commercial graphene nanoplates used in this work.
Fig. S2 SEM micrographs of Mg@Ni$_x$Gn$_{10-x}$ ($x = 2, 4, 6, 8$) composites prepared by HCS (left) and HCS+MM (right): (a) and (e) Mg@Ni$_8$Gn$_2$; (b) and (f) Mg@Ni$_6$Gn$_4$; (c) and (g) Mg@Ni$_6$Gn$_4$; (d) and (h) Mg@Ni$_8$Gn$_2$. 
Fig. S3 Hydrogen absorption curves for Mg@Ni$_x$Gn$_{10-x}$ (x = 2, 4, 6, 8) as well as the reference samples Mg@Ni and Mg@Gn composites prepared by HCS+MM. (a) 393 K; (b) 523 K; (c) 543 K. The initial hydrogen pressure during absorption is 3.0 MPa.
Fig. S4 Hydrogen desorption curves for Mg@Ni$_x$Gn$_{(10-x)}$ (x =2, 4, 6, 8) as well as the reference samples Mg@Ni and Mg@Gn composites prepared by HCS+MM at 473 K. The initial hydrogen pressure during desorption is 0.005 MPa.
Fig. S5   Hydrogen absorption/desorption PCT curves measured at 533, 573 and 603 K (a) and van’t Hoff plots (b) for the HCS+MM Mg@Ni8Gn2 sample.