Electronic Supplementary Information

Nickel-decorated graphene nanoplates for enhanced H_2 sorption properties of magnesium hydride at moderate temperatures

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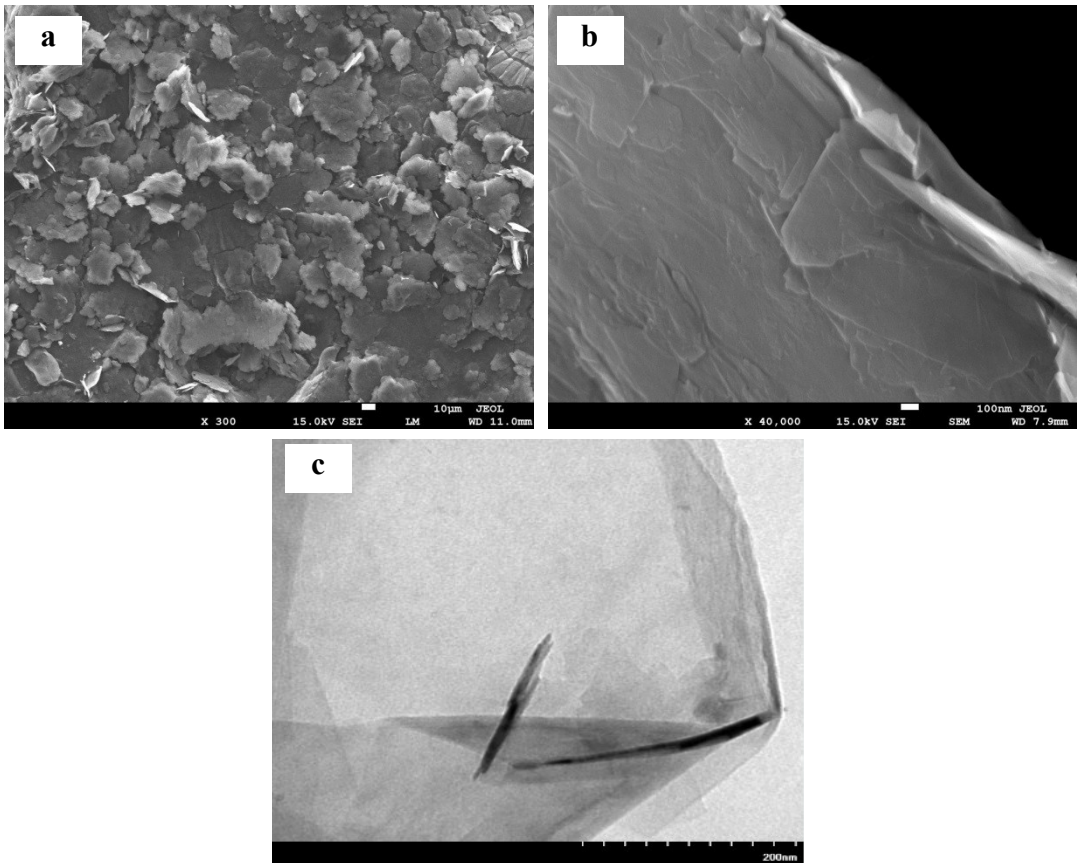

Fig. S1 SEM (a,b) and TEM (c) images of the commercial graphene nanoplates used in this work.

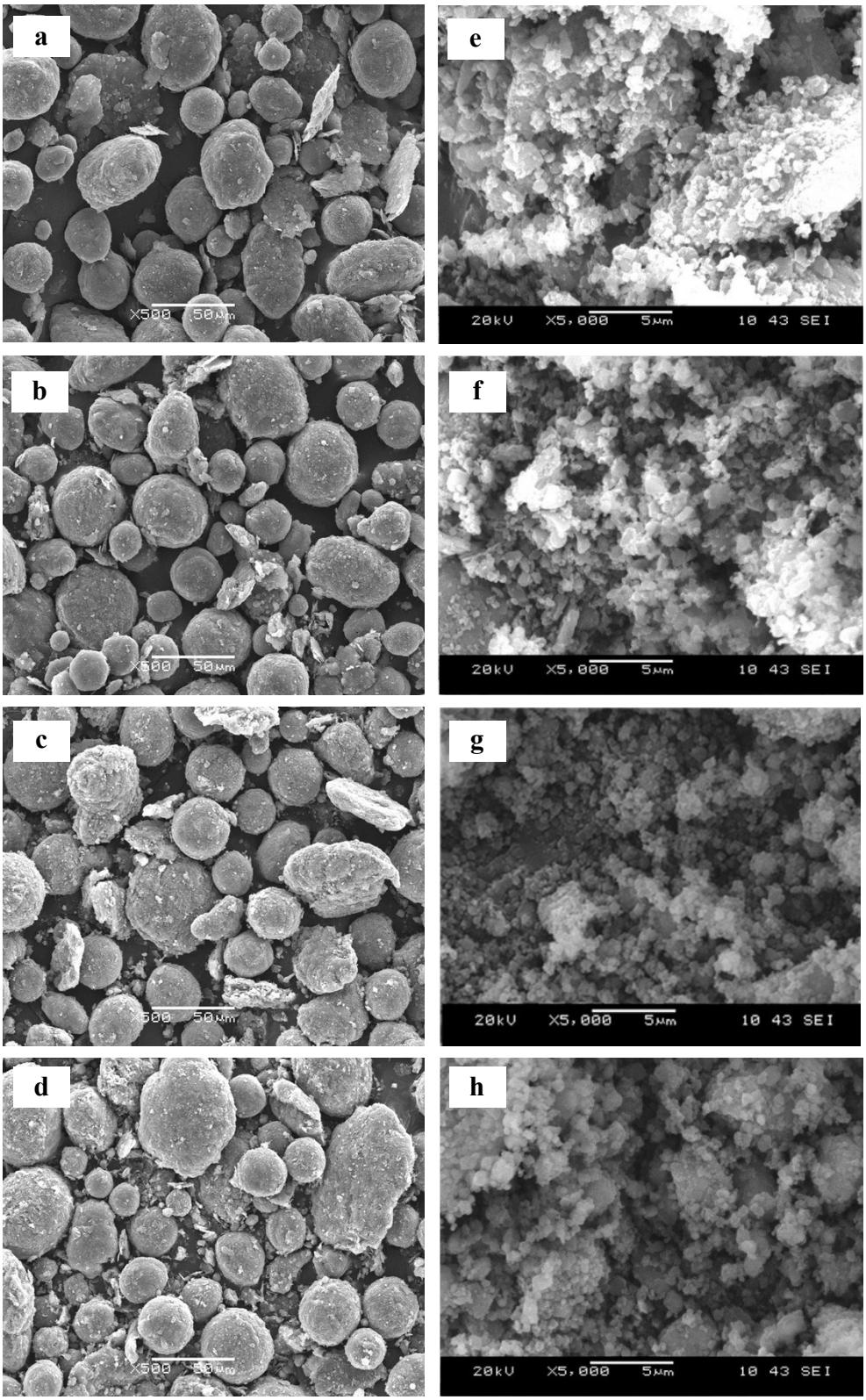

Fig. S2 SEM micrographs of $Mg@Ni_xGn_{10-x}$ (x =2, 4, 6, 8) composites prepared by HCS (left) and HCS+MM (right): (a) and (e) $Mg@Ni_2Gn_8$; (b) and (f) $Mg@Ni_4Gn_6$; (c) and (g) $Mg@Ni_6Gn_4$; (d) and (h) $Mg@Ni_8Gn_2$.

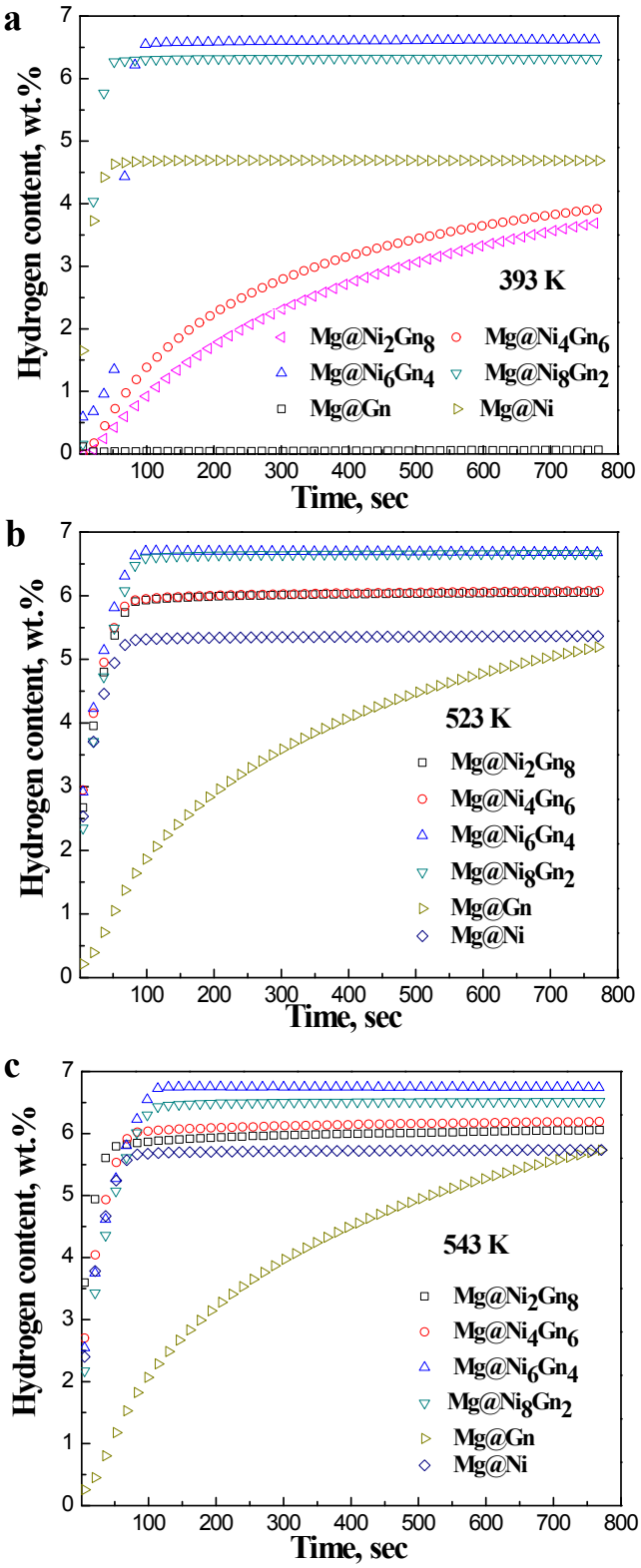

Fig. S3 Hydrogen absorption curves for $Mg@Ni_xGn_{10-x}$ (x =2, 4, 6, 8) as well as the reference samples Mg@Ni and Mg@Gn composites prepared by HCS+MM. (a) 393 K; (b) 523 K; (c) 543K. The initial hydrogen pressure during absorption is 3.0 MPa.

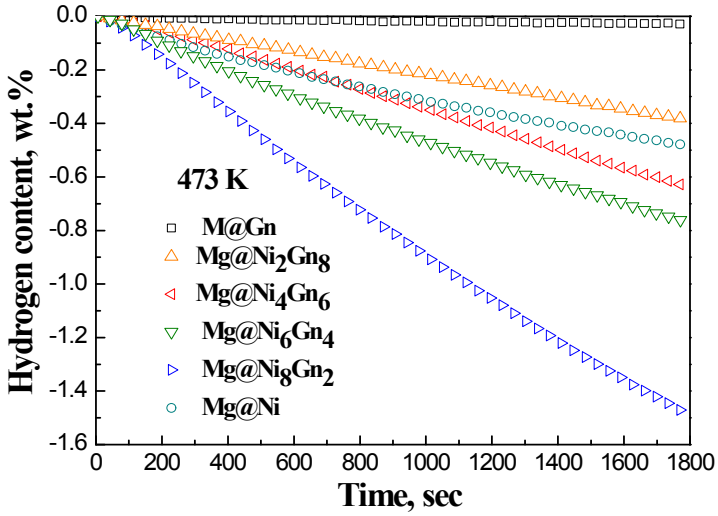

Fig. S4 Hydrogen desorption curves for $Mg@Ni_xGn_{10-x}$ (x =2, 4, 6, 8) as well as the reference samples Mg@Ni and Mg@Gn composites prepared by HCS+MM at 473 K. The initial hydrogen pressure during desorption is 0.005 MPa.

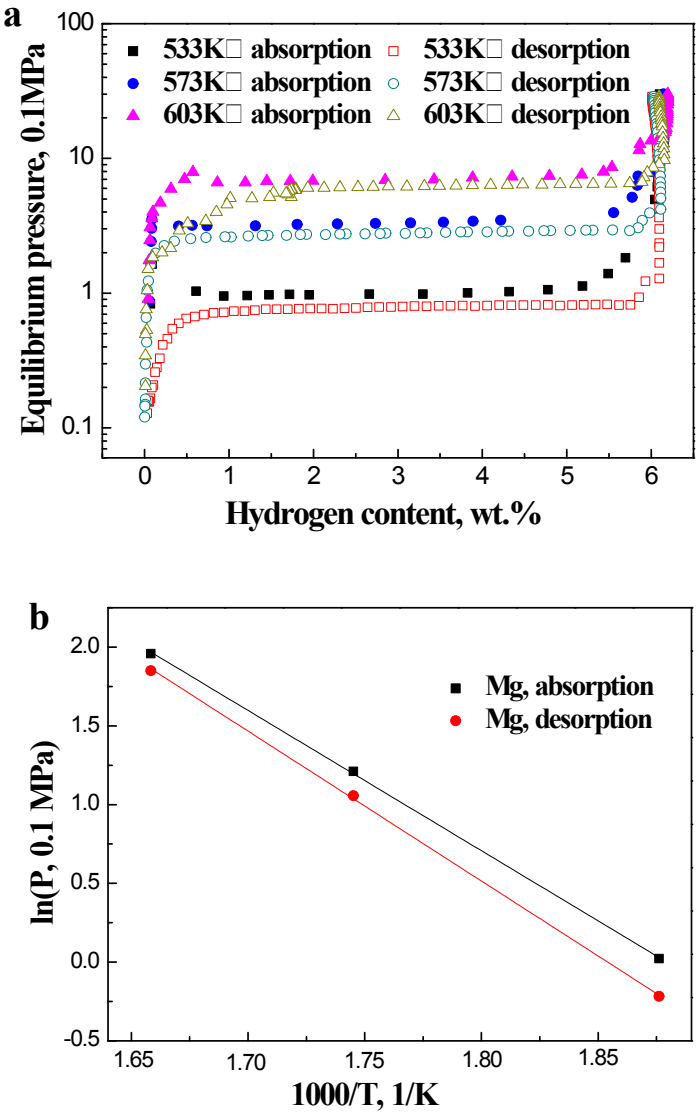

Fig. S5 Hydrogen absorption/desorption PCT curves measured at 533, 573 and 603 K (a) and van't Hoff plots (b) for the HCS+MM Mg@Ni_8Gn_2 sample.