Electronic Supplementary Information

Figure S1: $^1$H NMR spectra of Et$_2$Mg in C$_6$D$_6$ (top). Zoom of the $^1$H NMR spectra of Et$_2$Mg in C$_6$D$_6$ (bottom). Et$_2$Mg was synthesized in THF-D8.
Figure S2: $^{13}$C NMR spectra of Et$_2$Mg in C$_6$D$_6$ (top). Zoom of the $^{13}$C NMR spectra of Et$_2$Mg in C$_6$D$_6$ (bottom). Et$_2$Mg was synthesized in THF-D8.
Figure S3. TDS spectra of 21Mg_{3.8}-Ni-H@CT and 18Mg_{2.3}-Ni-H@CT hybrids.