

## Electronic Supplementary Information

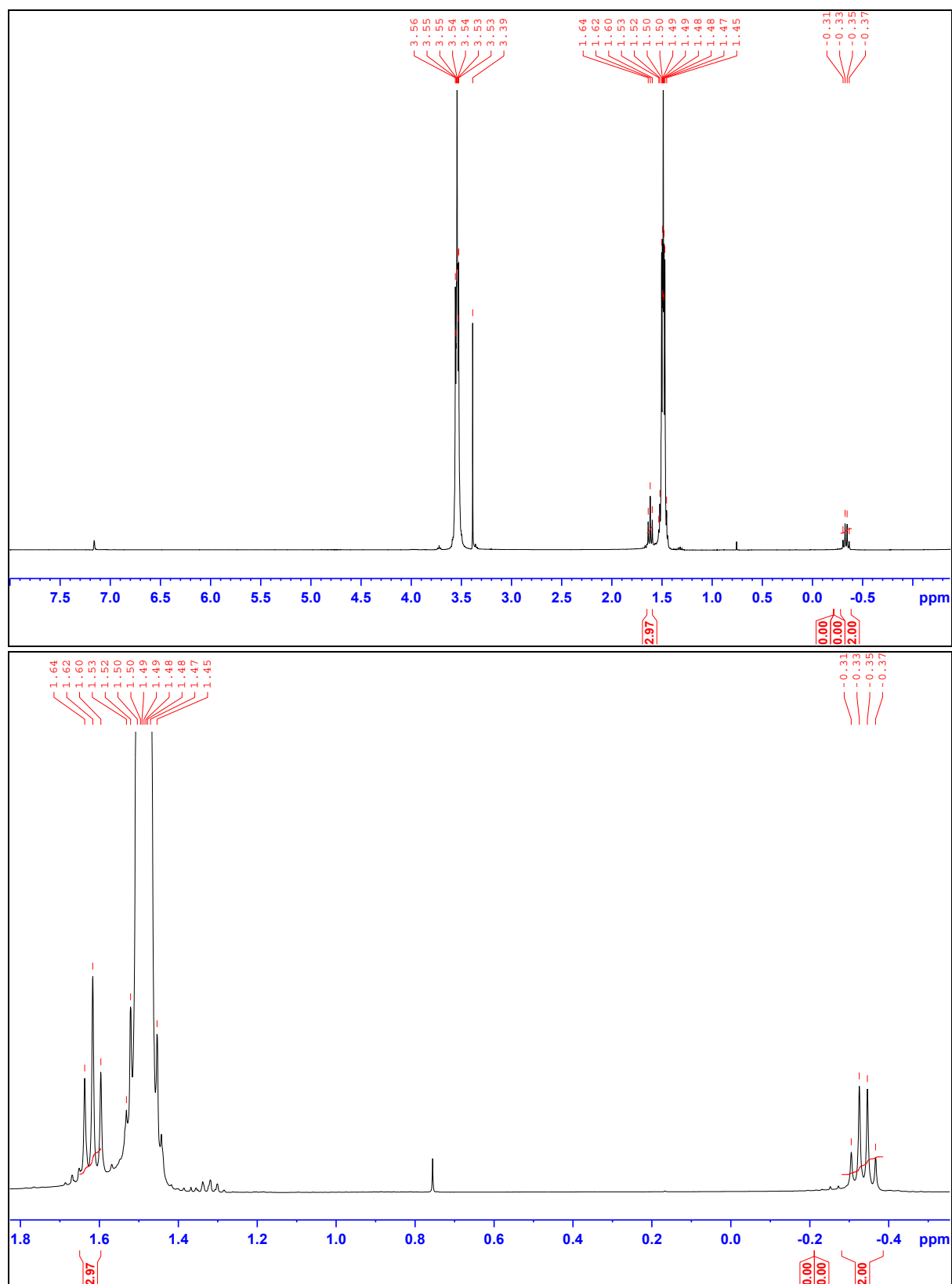


Figure S1:  $^1\text{H}$  NMR spectra of  $\text{Et}_2\text{Mg}$  in  $\text{C}_6\text{D}_6$  (top). Zoom of the  $^1\text{H}$  NMR spectra of  $\text{Et}_2\text{Mg}$  in  $\text{C}_6\text{D}_6$  (bottom).  $\text{Et}_2\text{Mg}$  was synthesized in  $\text{THF-D}_8$ .

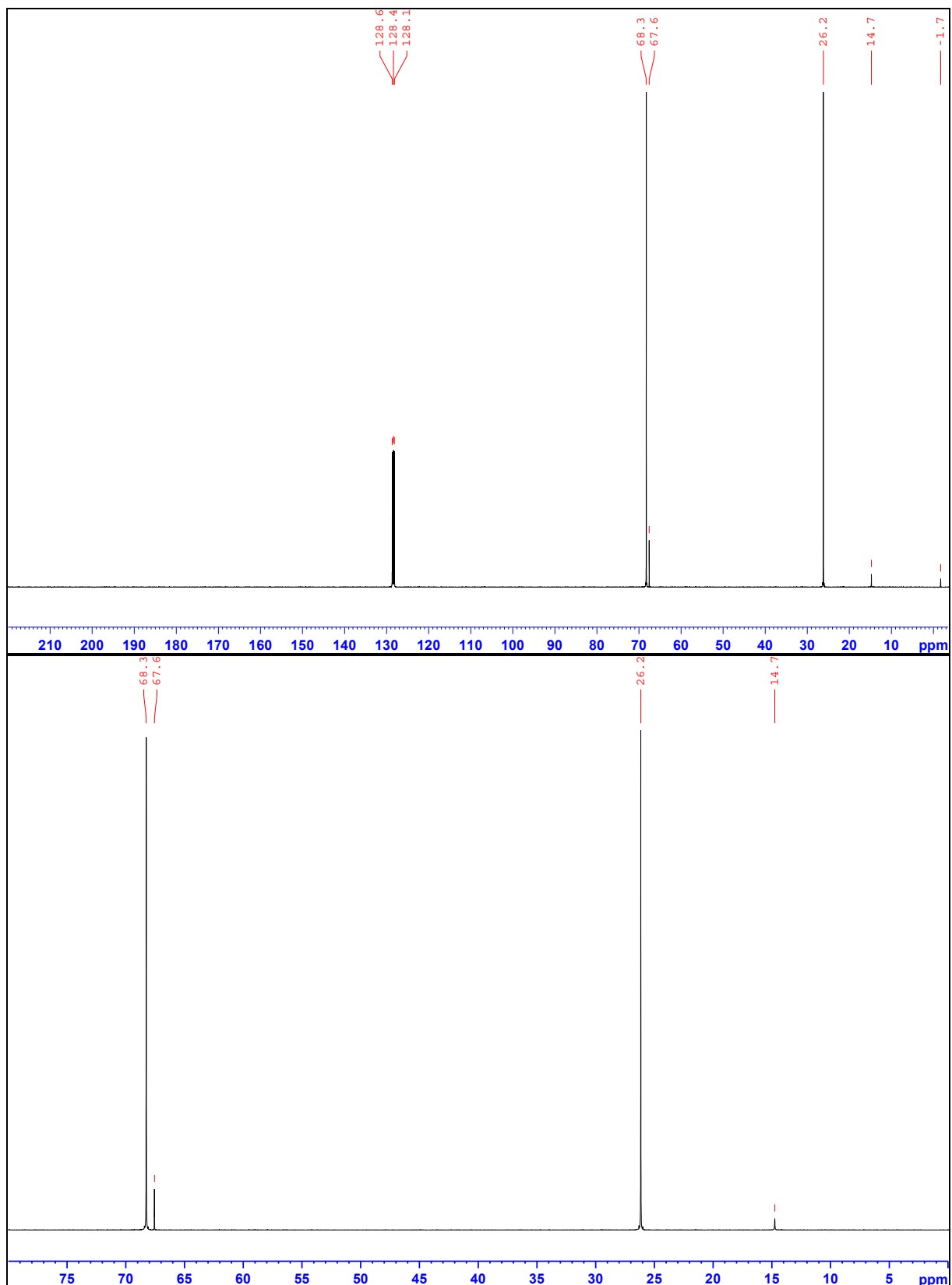


Figure S2:  $^{13}\text{C}$  NMR spectra of  $\text{Et}_2\text{Mg}$  in  $\text{C}_6\text{D}_6$  (top). Zoom of the  $^{13}\text{C}$  NMR spectra of  $\text{Et}_2\text{Mg}$  in  $\text{C}_6\text{D}_6$  (bottom).  $\text{Et}_2\text{Mg}$  was synthesized in THF-D8.

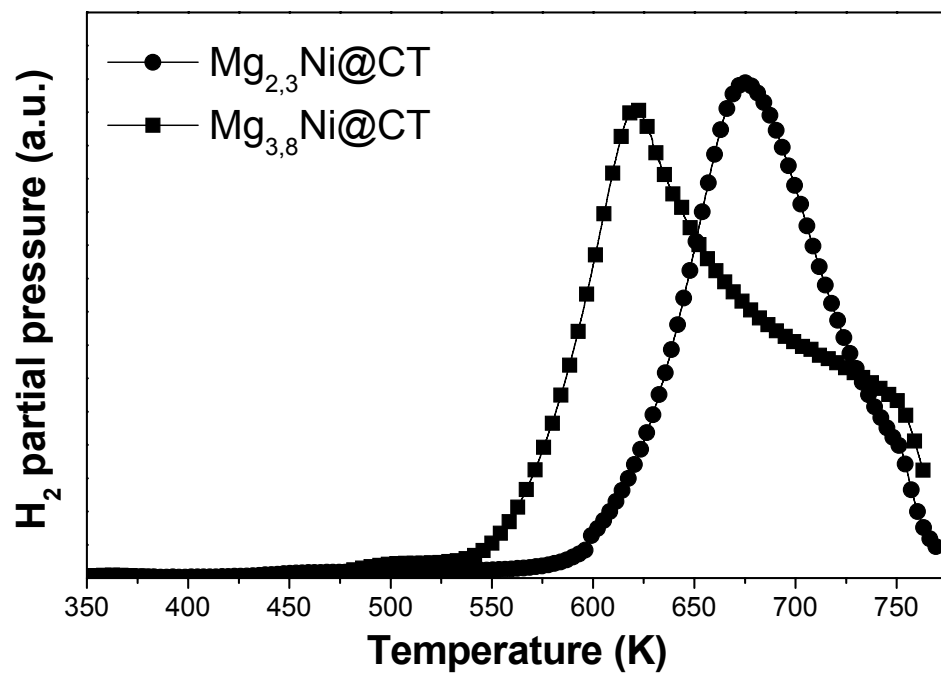


Figure S3. TDS spectra of 21Mg<sub>3,8</sub>-Ni-H@CT and 18Mg<sub>2,3</sub>-Ni-H@CT hybrids.