

Electronic supplementary information

Fig. S1 shows typical results of EDX analysis for $0.9\text{MgH}_2\text{-}0.1\text{TiH}_2$ (Fig. S1a) and $0.7\text{MgH}_2\text{-}0.3\text{TiH}_2$ (Fig. S1b) nanocomposites. For both samples, Mg and Ti signals are observed to coexist at the spatial resolution of EDX analysis (typically $1\ \mu\text{m}^3$). This proves that the nanocomposites are chemically homogeneous at the micrometric level. The relative intensity of Mg and Ti peaks are in agreement with the nominal abundance of both elements in each composite.

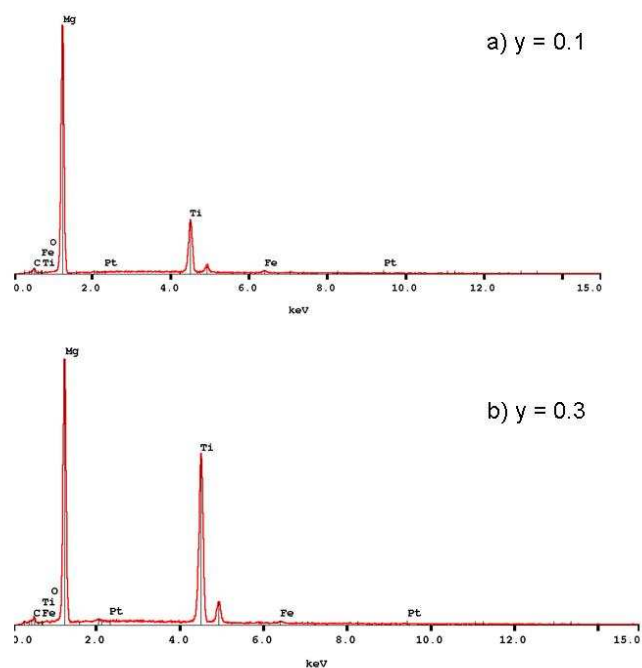


Figure S1. EDX spectra of a) $0.9\text{MgH}_2\text{-}0.1\text{TiH}_2$ and b) $0.3\text{MgH}_2\text{-}0.7\text{TiH}_2$ composites.

Fig. S2 displays the H-absorption kinetics at room temperature of $0.7\text{MgH}_2\text{-}0.3\text{TiH}_2$ nanocomposites. It shows a significant reactivity of the nanocomposite towards hydrogen near room temperature.

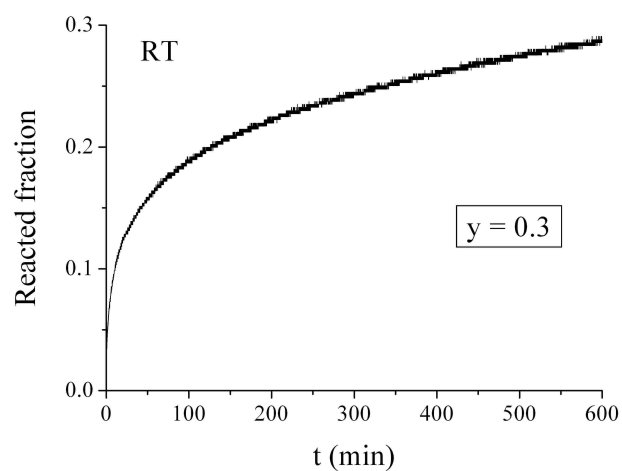


Figure S2. H-absorption kinetics of $0.7\text{MgH}_2 + 0.3\text{TiH}_2$ nanocomposite at room temperature. $P_{\text{abs}} = 0.8\ \text{MPa}$.