Supplementary Information

Destabilisation of Ca(BH₄)₂ and Mg(BH₄)₂ via confinement in nanoporous Cu₂S hollow spheres

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Fig S1. Hydrogen desorption profiles of as-synthesised (a) $Ca(BH_4)_2@Cu_2S$ and (b) $Mg(BH_4)_2@Cu_2S$ as monitored by mass spectrometry. In addition to hydrogen, diborane and hydrogen sulphide was released.



Fig. S2 Hydrogen desorption profiles of (a) bulk $Ca(BH_4)_2$ and (b) bulk $Mg(BH_4)_2$ both physically mixed with 70 mass% of Cu_2S hollow spheres as monitored by mass spectrometry. In addition to hydrogen diborane and hydrogen sulphide was released.



Fig. S3 TGA/DSC profiles of (a) bulk $Ca(BH_4)_2$ and (b) bulk $Mg(BH_4)_2$ both physically mixed with 70 mass% of Cu_2S hollow spheres.



Fig. S4 (a)-(b) Typical TEM images of physical mixture of $Ca(BH_4)_2 + 5$ mass % Cu_2S , and corresponding (c) EDS elemental mapping, (d) EDS and (e) lines scan analysis.



Fig. S5 (a)-(b) Typical TEM images of physical mixture of $Mg(BH_4)_2 + 5$ mass % Cu₂S, and corresponding (c) EDS elemental mapping, (d) EDS and (e) lines scan analysis.



Fig. S6 (a)-(b) Typical TEM images of physical mixture of $Ca(BH_4)_2 + 5$ mass % Cu_2S after absorption at 400 °C under 6 MPa H₂ pressure, and corresponding (c) elemental mapping, (d) EDS and (e) lines scan analysis.



Fig. S7 (a)-(b) Typical TEM images of physical mixture of $Mg(BH_4)_2 + 5$ mass % Cu₂S after absorption at 400 °C under 6 MPa H₂ pressure, and corresponding (c) elemental mapping, (d) EDS and (e) lines scan analysis.