Supplementary Information

Destabilisation of Ca(BH$_4$)$_2$ and Mg(BH$_4$)$_2$ via confinement in nanoporous Cu$_2$S hollow spheres

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Fig S1. Hydrogen desorption profiles of as-synthesised (a) Ca(BH$_4$)$_2$@Cu$_2$S and (b) Mg(BH$_4$)$_2$@Cu$_2$S 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$_2$S 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(BH₄)₂ and (b) bulk Mg(BH₄)₂ both physically mixed with 70 mass% of Cu₂S hollow spheres.
Fig. S4 (a)-(b) Typical TEM images of physical mixture of Ca(BH₄)₂ + 5 mass % Cu₂S, 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 % Cu$_2$S, 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$_2$S after absorption at 400 °C under 6 MPa H$_2$ 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 % Cu$_2$S after absorption at 400 °C under 6 MPa H$_2$ pressure, and corresponding (c) elemental mapping, (d) EDS and (e) lines scan analysis.