ARTICLE

Sustainable NaAlH4 production from recycled automotive Al alloy

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Supporting Information

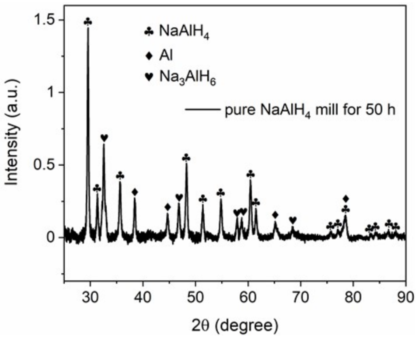

Fig. S1 XRD pattern (λ =1.54184 Å) of the NaH + pure Al mixture collected after 50 h's ball milling under about 83 bar of hydrogen.

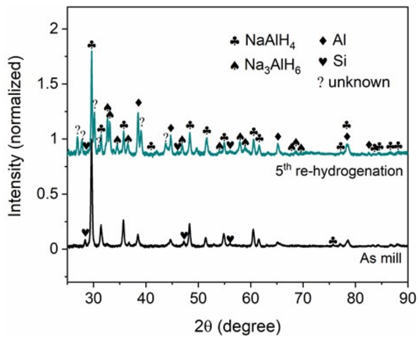

Fig. S2. XRD patterns of the as-milled, and 5th re-hydrogenation of the less pure $NaAlH_4$.

Table S1 Fitting models and their corresponding kinetic reaction equations used for the hydrogenation curves of the less pure $NaAlH_4$[1].

Model types	Kinetic rate models	Fitting equations
Diffusion models	D1 one-dimensional diffusion	α^2/0.25
	D2 two-dimensional diffusion	$(\alpha + (1 - \alpha) * ln⟦(1 - \alpha)⟧)/0$
	D3 Jander equation for three-dimensional diffusion	$⟦(1 - ⟦(1 - \alpha)⟧$^(1/3))⟧^2/0.0
	D4 Ginstling-Braunshtein equation for three dimensional diffusion	$(1 - 2/3 ⟦\alpha - (1 - \alpha)⟧$^(2/3))/
Geometrical contraction models	R2 two-dimensional interface controlled	$(1 - ⟦(1 - \alpha)⟧$^(1/2))/0.29289
	R3 three-dimensional interface controlled	$(1 - ⟦(1 - \alpha)⟧$^(1/3))/0.20629
Nucleation and growth models	F1 JMA- n = 1	$(- ln⟦(1 - \alpha)⟧)/0.6931$
	F2 JMA- n = 1/2	$(- ln⟦⟦(1 - \alpha)⟧$^(1/2) ⟧)/0.8
	F3 JMA- n = 1/3	$(- ln⟦⟦(1 - \alpha)⟧$^(1/3) ⟧)/0.8
	F4 JMA- n = 1/4	$(- ln⟦⟦(1 - \alpha)⟧$^(1/4) ⟧)/0.9

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† Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here]. See DOI: 10.1039/x0xx00000x

References

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