

Electronic Supplementary Information (ESI)

An Al-Li alloy/water system for superior and low-temperature hydrogen production

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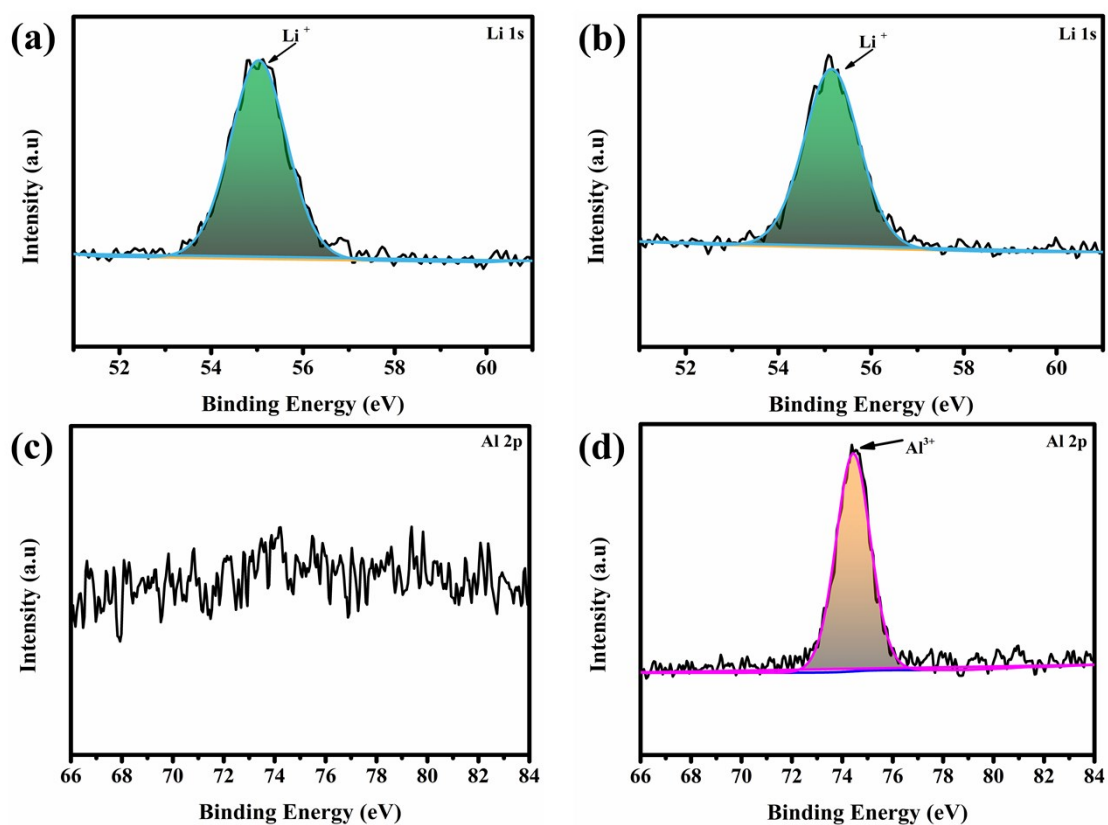
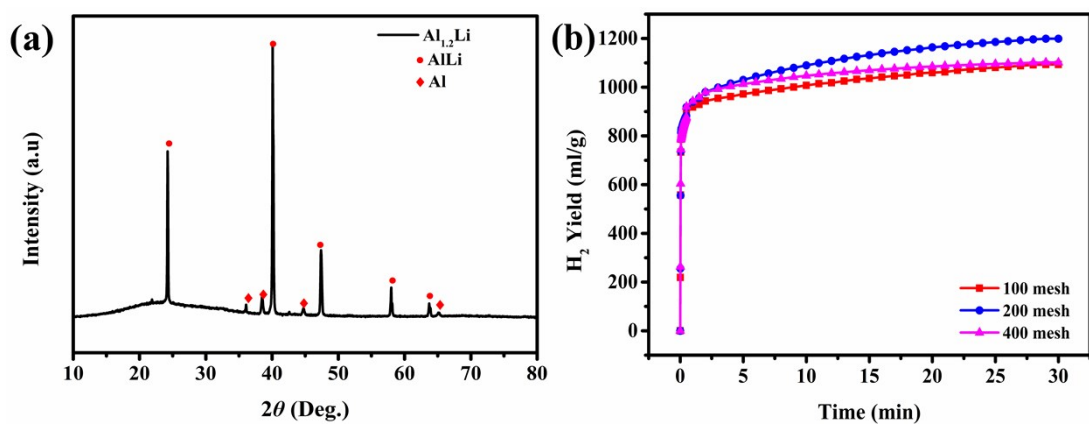
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Table S1. The mass fraction of Al and Li for as-prepared alloys and Alloy 1- [<100]>'s hydrolytic by-products from ICP-OES test.

Sample	Al (wt.%)	Li (wt.%)	Al/Li mass fraction ratio
1	68.1	31.9	2.13
2	82.4	17.6	4.68
Alloy 1- [<100]>'s hydrolytic by-products	16.9%	8.0%	2.11

Table S2. Comparison of various Al-based alloys and composites for hydrogen production. Gravimetric H₂ density is calculated without water included.

Materials	H ₂ production kinetics	Gravimetric H ₂ density	Ea	References
Al-9%Li-4%In-1%Zn	1214 ml/g in 15 min	10.4 wt%	22.5	1
Al-19.15%Li	645 ml/g in 10min	7.0 wt.%	-	2
Al-20%Li-5%Sn	1231ml/g in 1min	11.4 wt.%	-	3
Al-5%InCl ₃ -7%(Ni-Bi-B)	1197 ml/g in 10 min	9.8 wt.%	22.4	4
Al-15%Bi ₂ O ₂ CO ₃ -5%NaCl	900 ml/g in 10 min	7.3wt.%	9.4	5
Al-15%BiOCl	1058 m/g in 5min	8.6wt.%	26.9	6
Al-19%(Ca-In-Sn)-1%Cu	<500 ml/g in 10 min	< 4.1 wt.%	28.0	7
Al-graphite-Al(OH) ₃	1360 ml/ g in 20 min	11.1 wt.%	27.9	8
Al-10%Bi(OH) ₃ -5%NaCl	1000 ml/g in 2 min	8.2 wt.%	10.4	9
Al-31.9%Li- [<200]>	1190 ml/g in 30min	9.7 wt.%	-	our work
Al-31.9%Li- [<100]>	1496 ml/g in 0.5 min	12.2 wt.%	3.3	our work



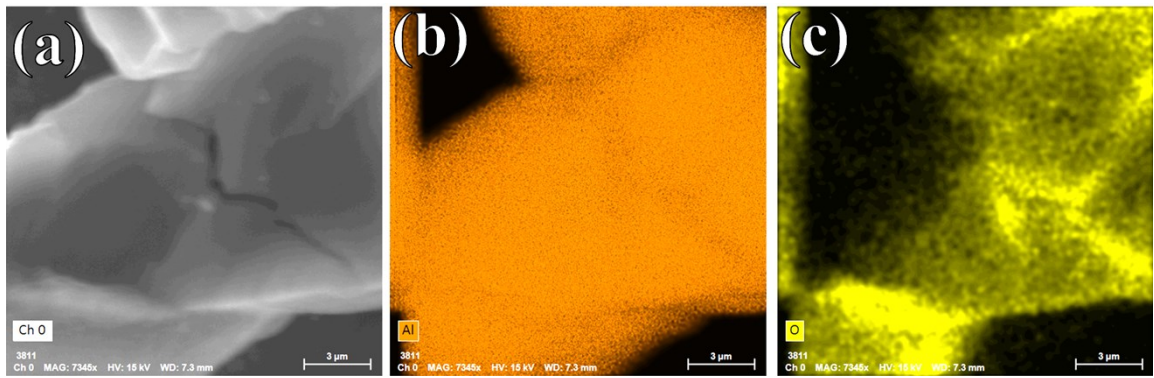


Figure S3. EDS elemental mapping of the Al-31.9%-[<100] alloy.

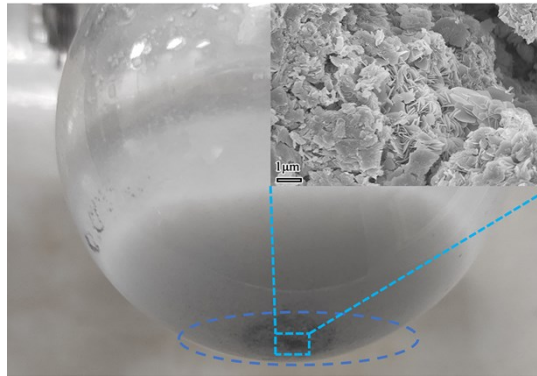


Figure S4. The molten product of the Al-31.9%Li-[<400] during the hydrolysis process and its SEM image was shown in inset.

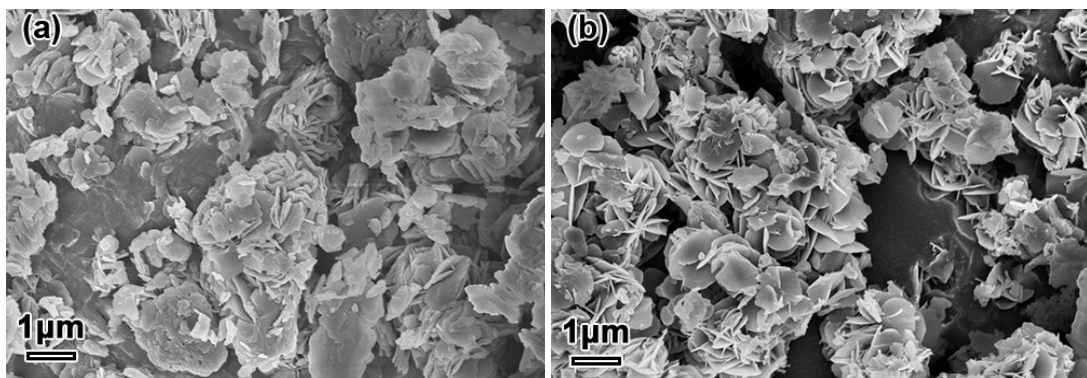


Figure S5. SEM images of the solid hydrolysis by-products of (a) Al-31.9%Li-[<100] and (b) Al-31.9%Li-[<400].

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