Dehydrogenation of surface-oxidized mixtures of $2LiBH_4$+Al/additives (TiF_3 or CeO_2)

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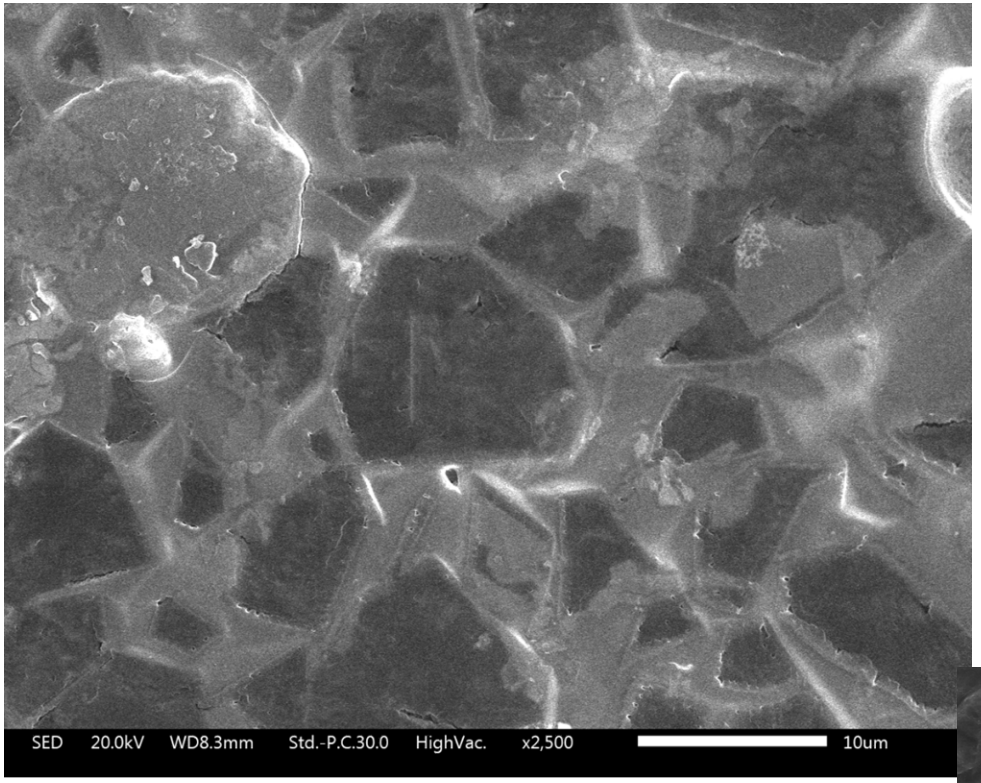


Fig.S1. SEM image of $LiBH_4$ (not ball-milled).

Fig.S2. SEM image of Al (not ball-milled).

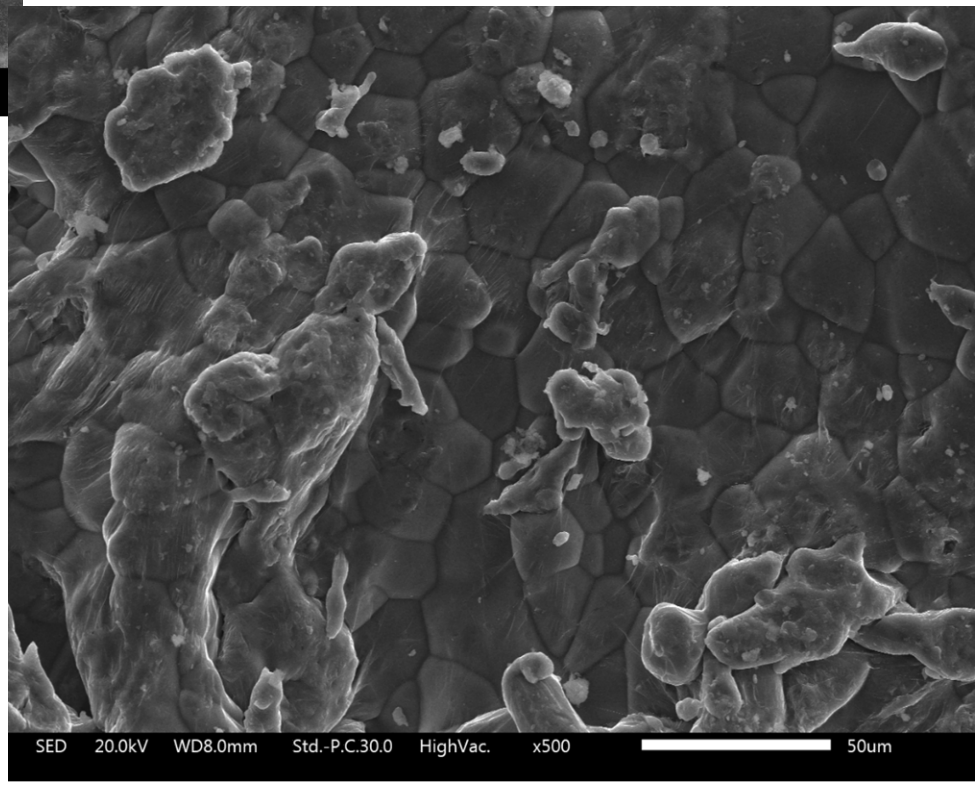


Fig. S3. SEM of as-milled $2LiBH_4$+Al material

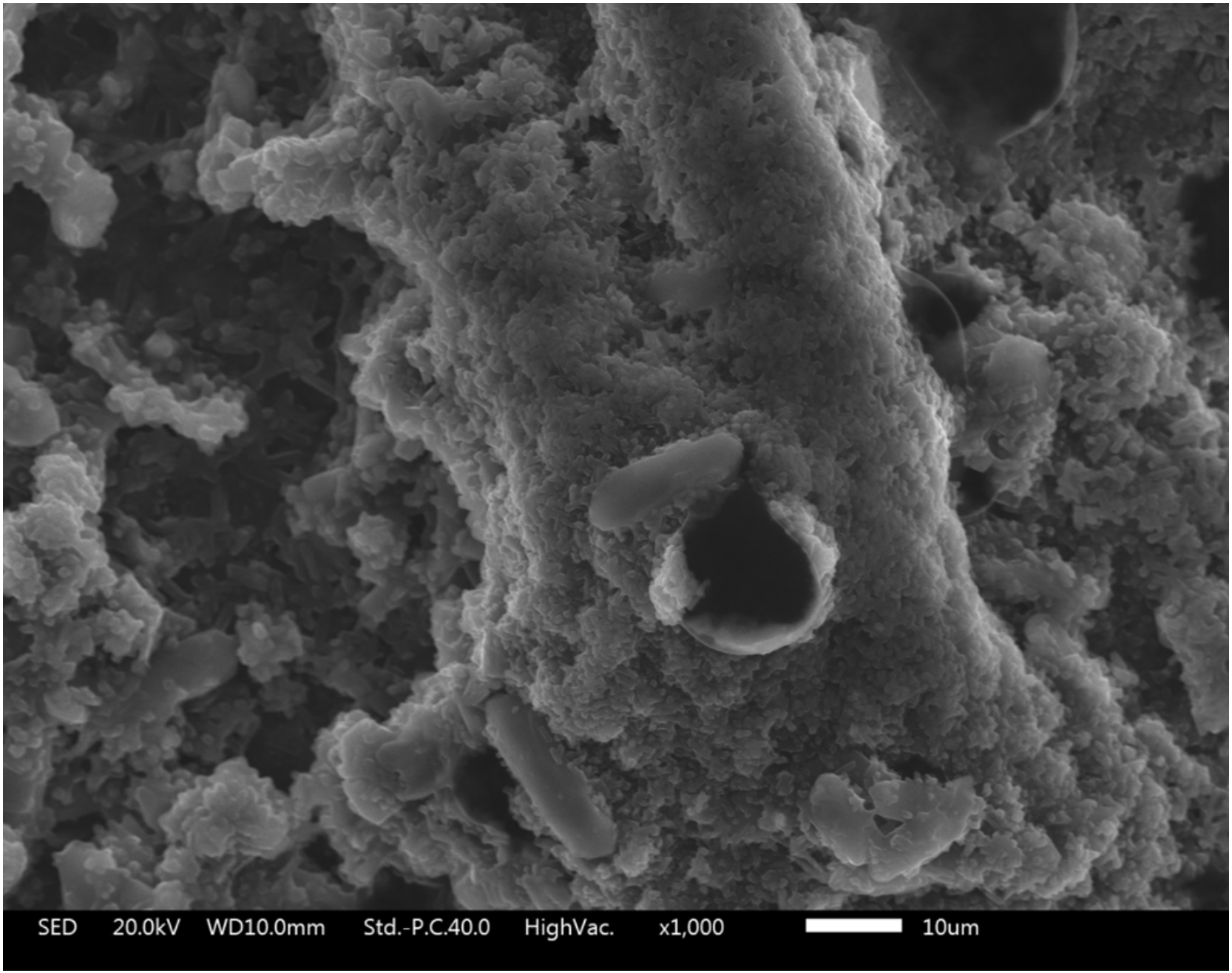


Fig. S4. SEM of as-milled $2LiBH_4$+Al/TiF_3 material

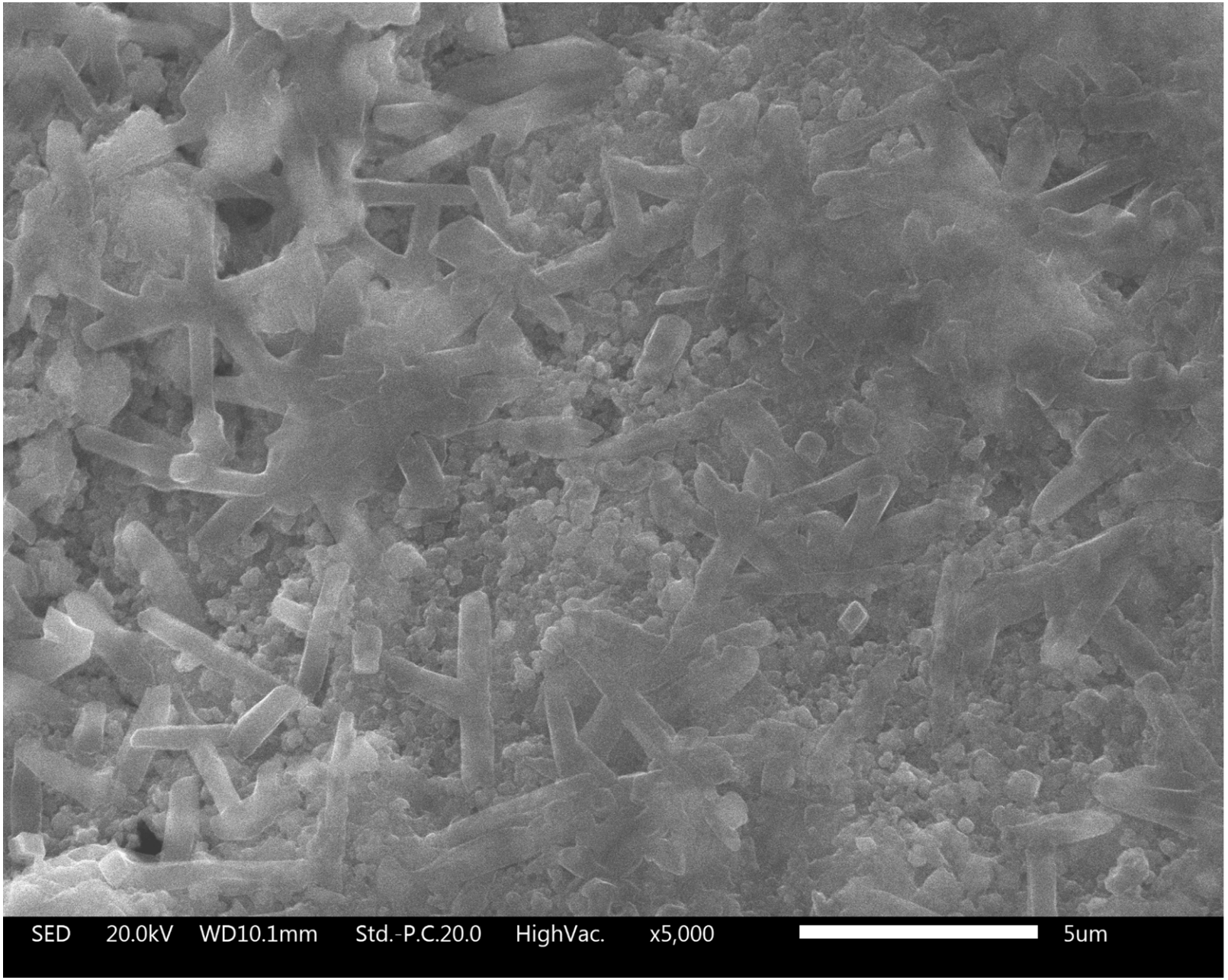


Fig. S5. SEM of as-milled $2LiBH_4$+Al/CeO_2 material

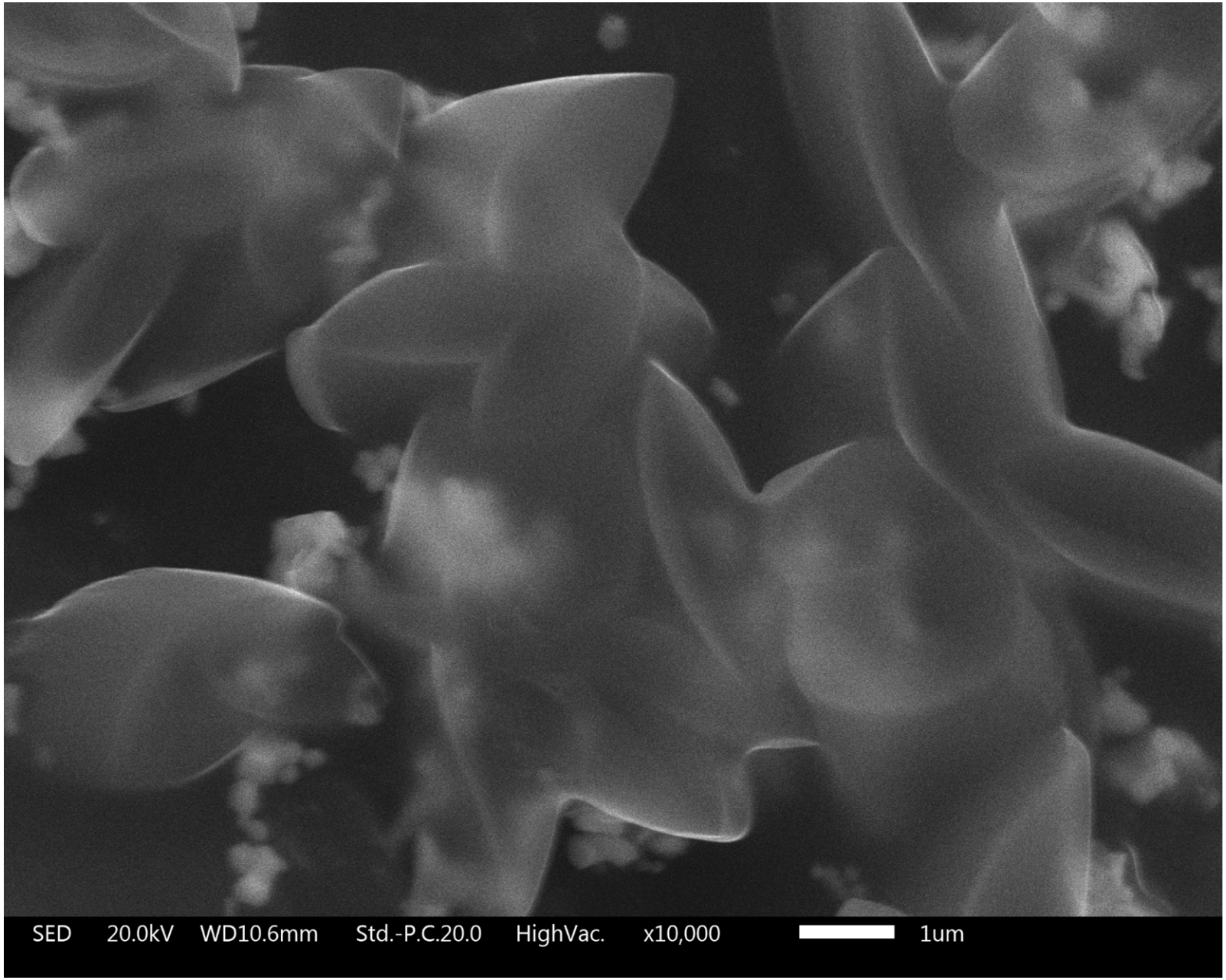


Fig.S6. FT-IR of the as-milled $2LiBH_4$+Al, $2LiBH_4$+Al/TiF_3 and $2LiBH_4$/CeO_2.

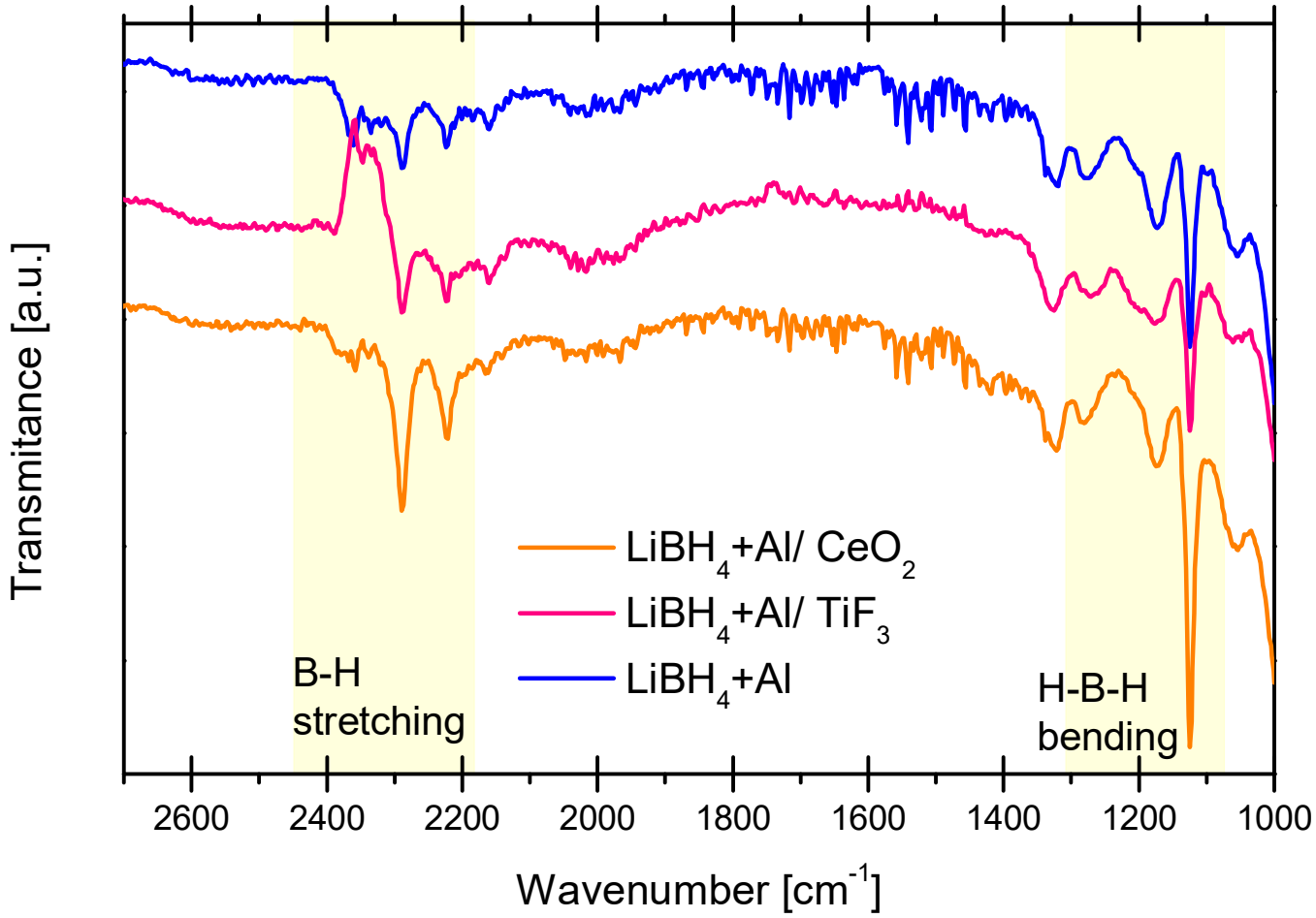


Fig.S7. Al 1s XPS of the as-milled $2LiBH_4$+Al, $2LiBH_4$+Al/TiF_3 and $2LiBH_4$/CeO_2.

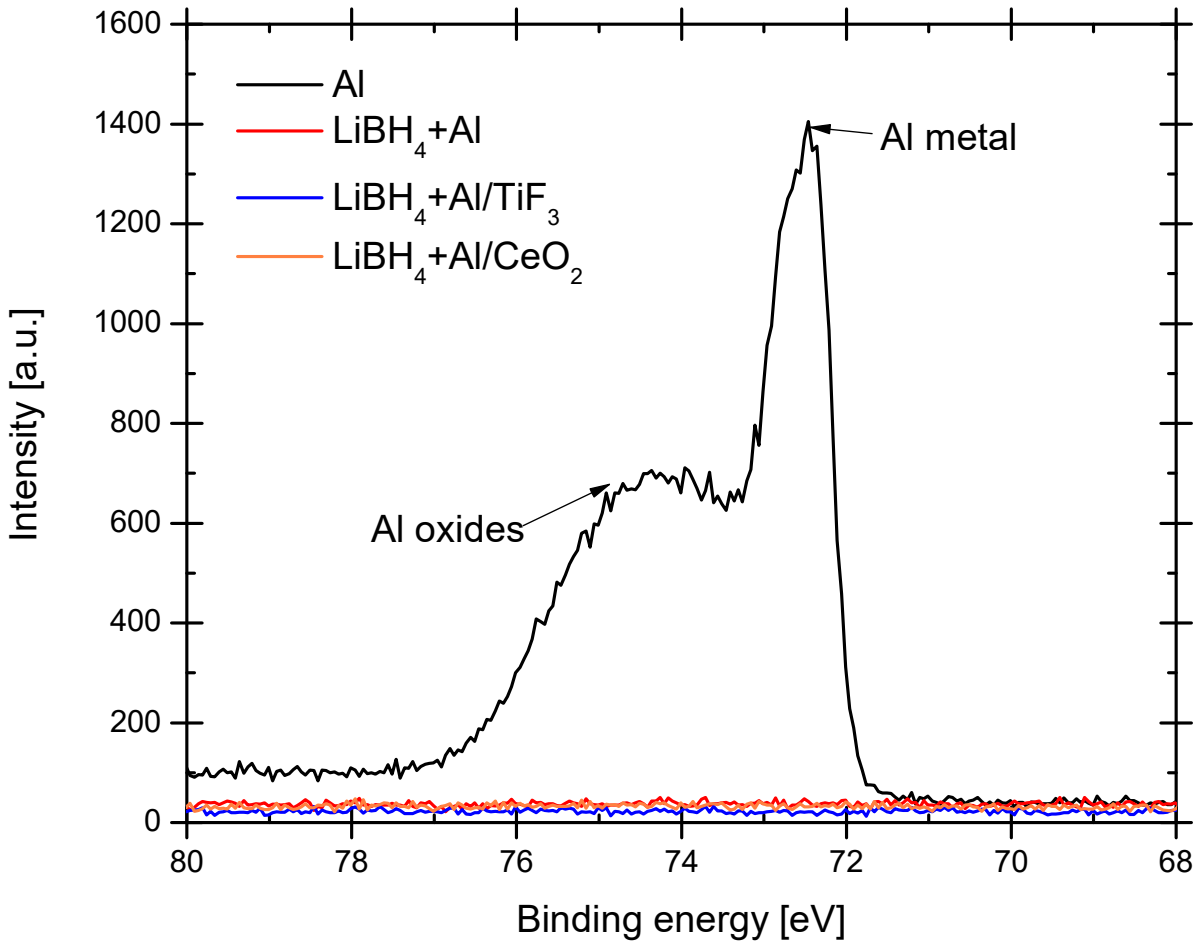
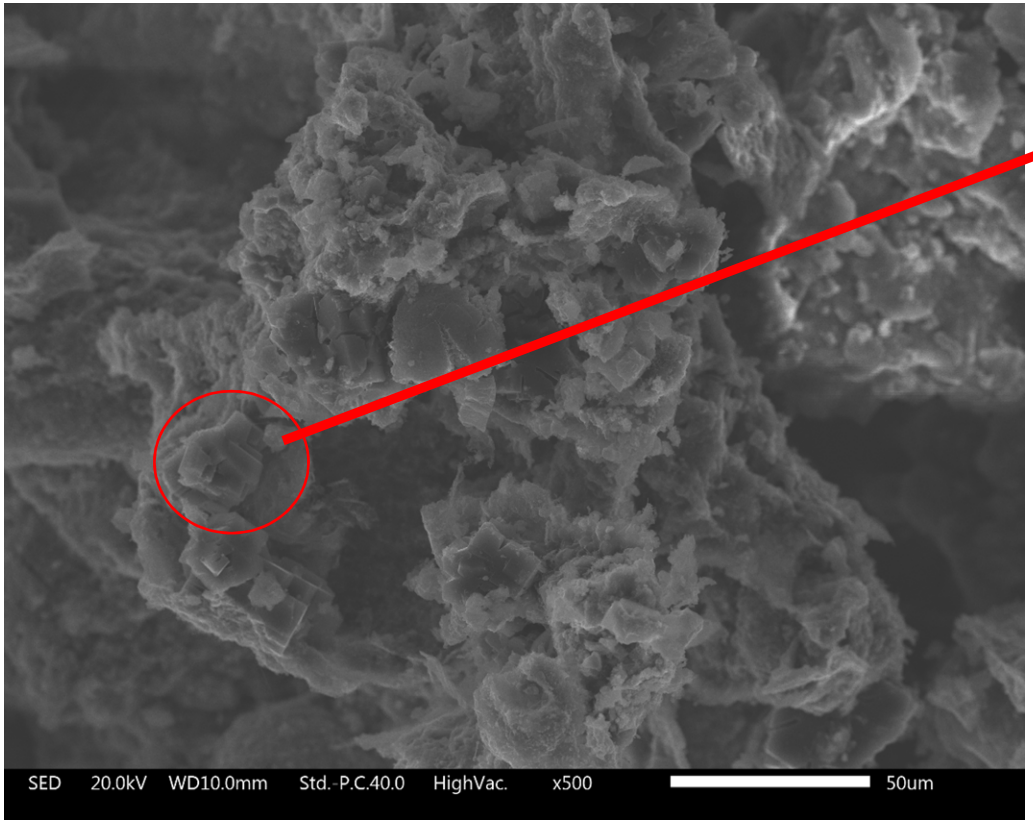
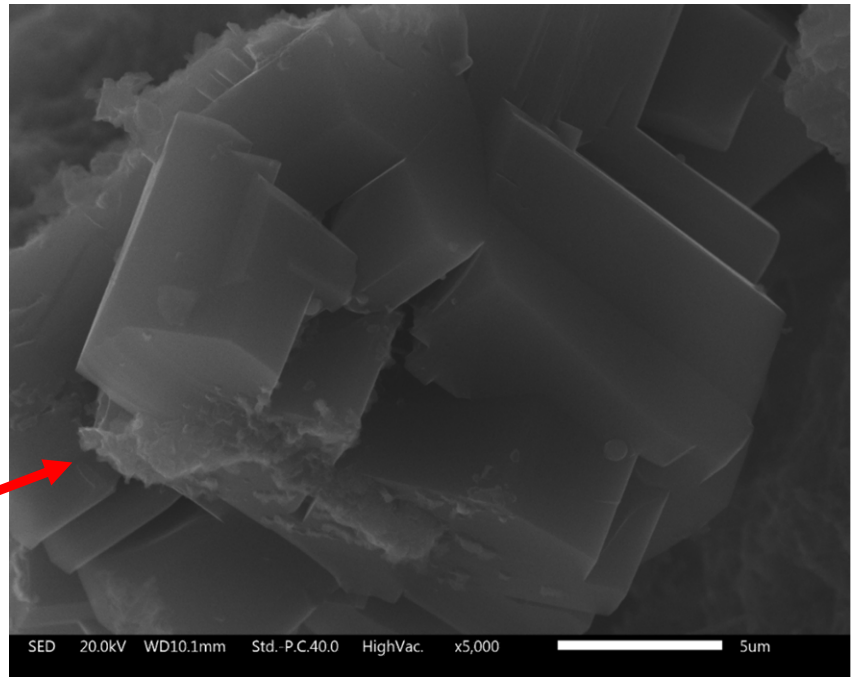


Fig. S8. SEM of dehydrogenated $2LiBH_4$+Al at 5bar 400°C





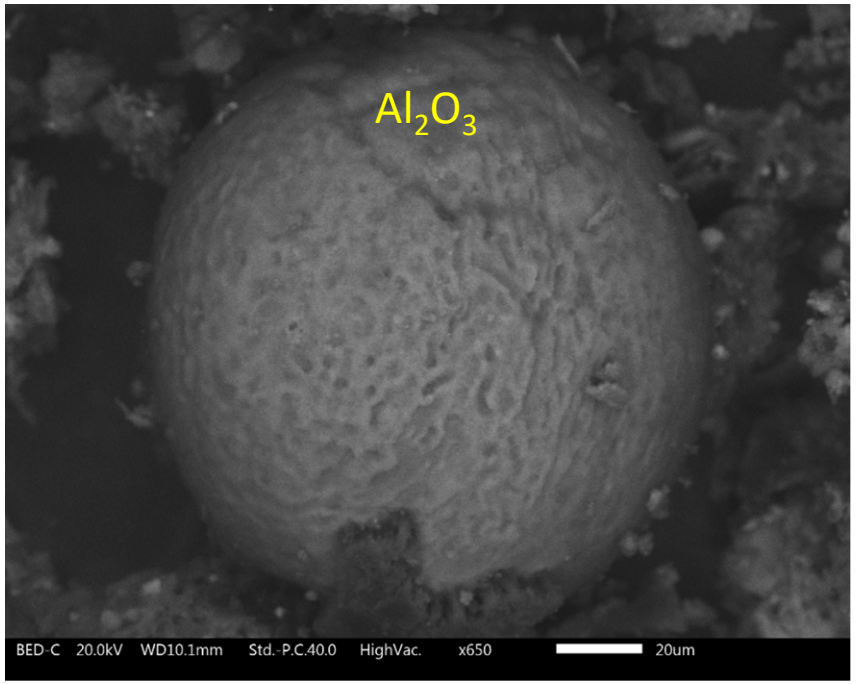


Fig. S9. SEM of dehydrogenated $2LiBH_4$+Al at 3 bar 400°C

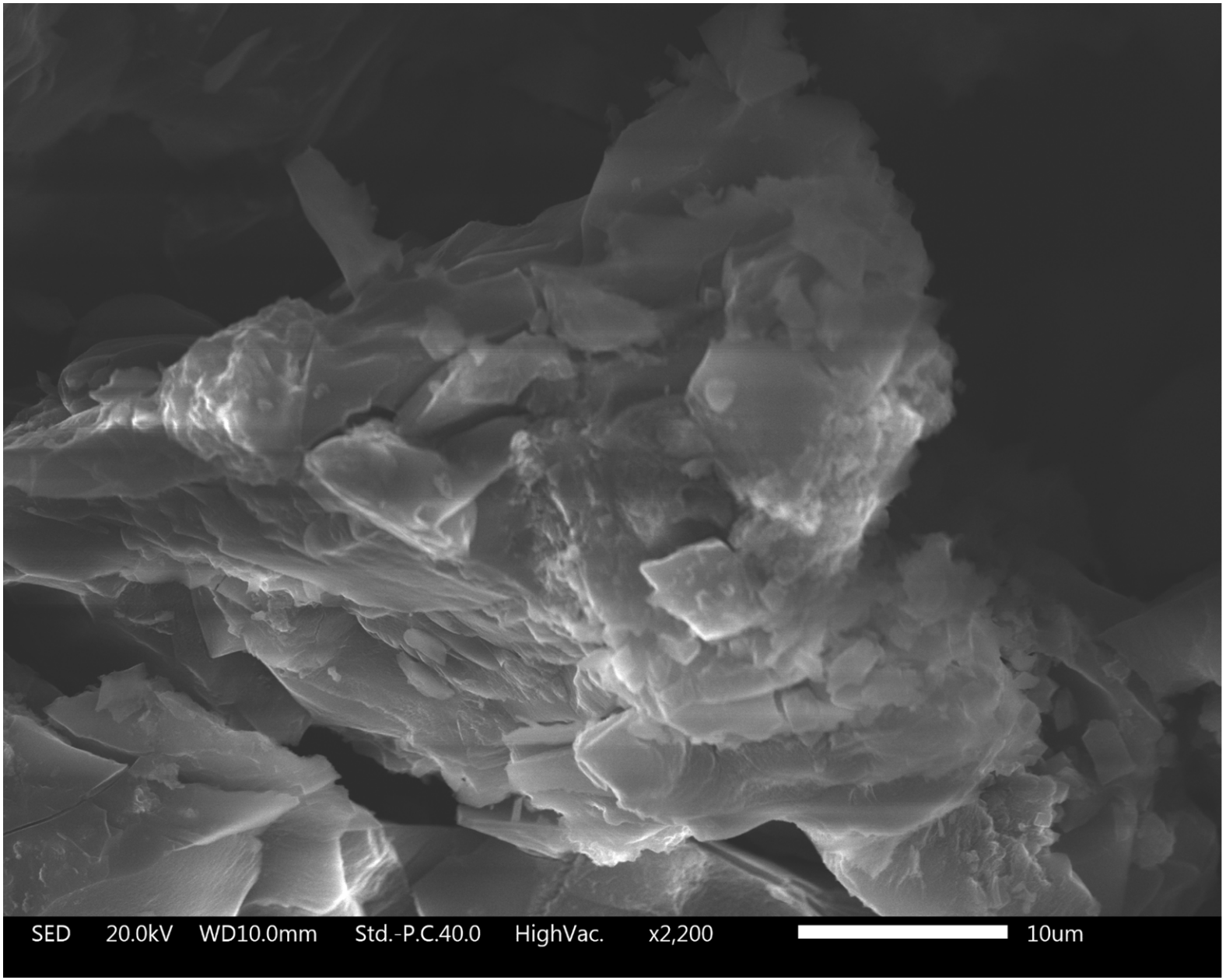
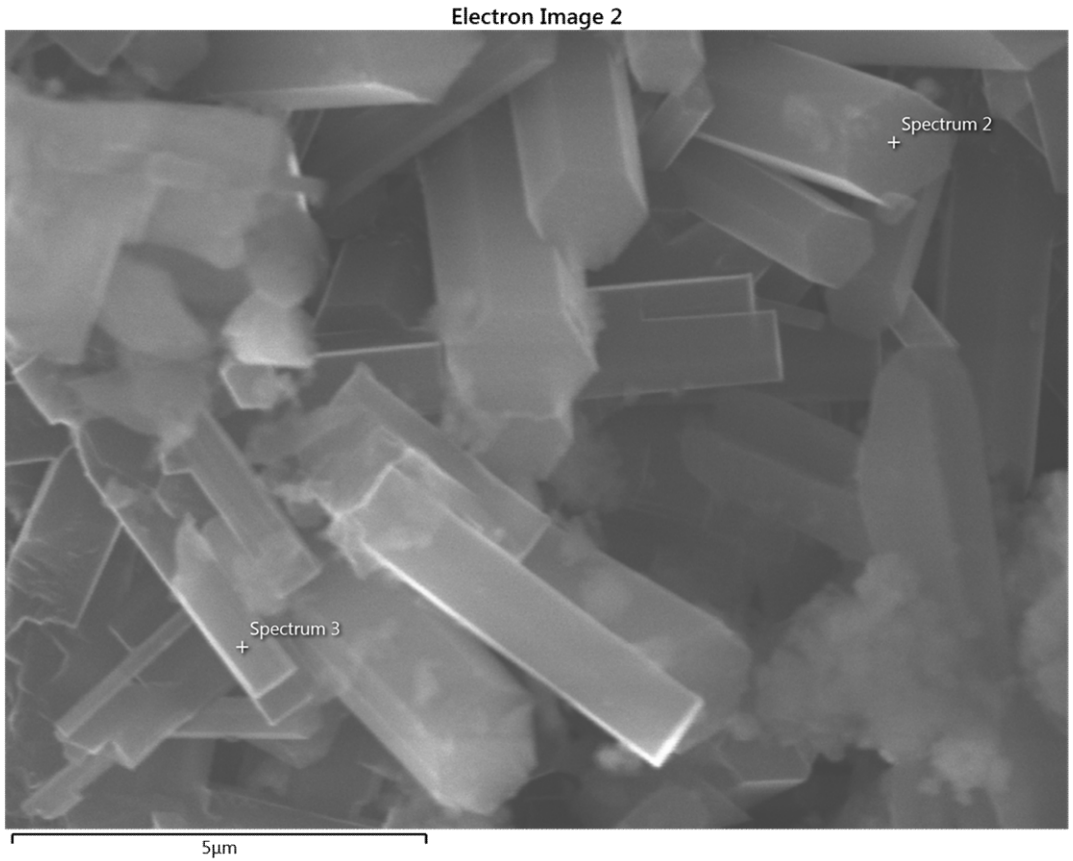
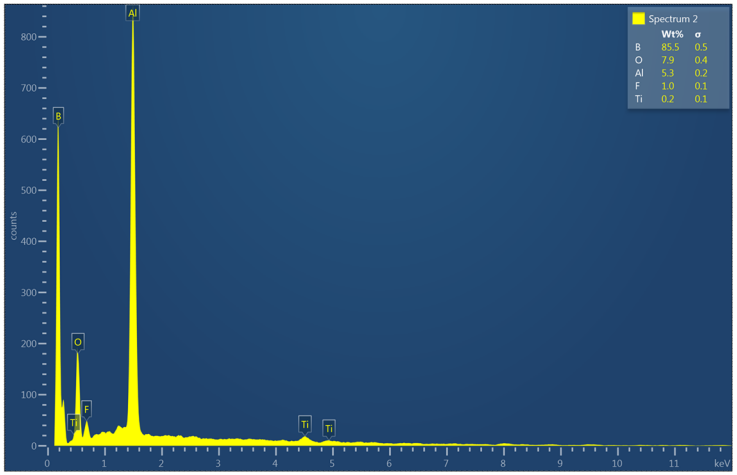


Fig. S10. SEM and EDS of dehydrogenated $2LiBH_4+Al/TiF_3$ at 5bar 400°C





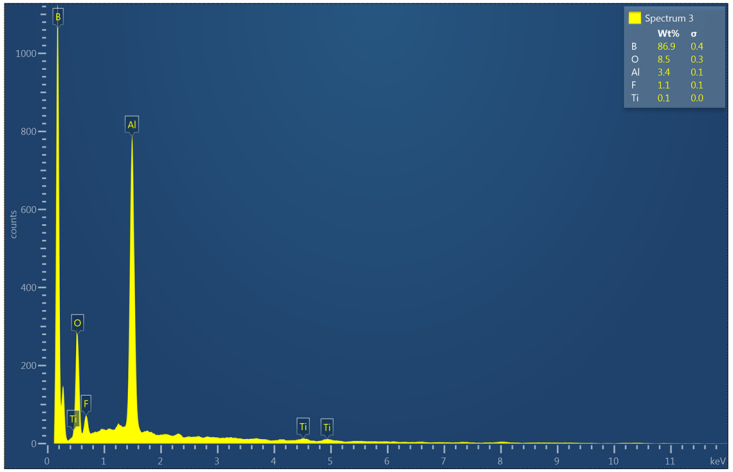
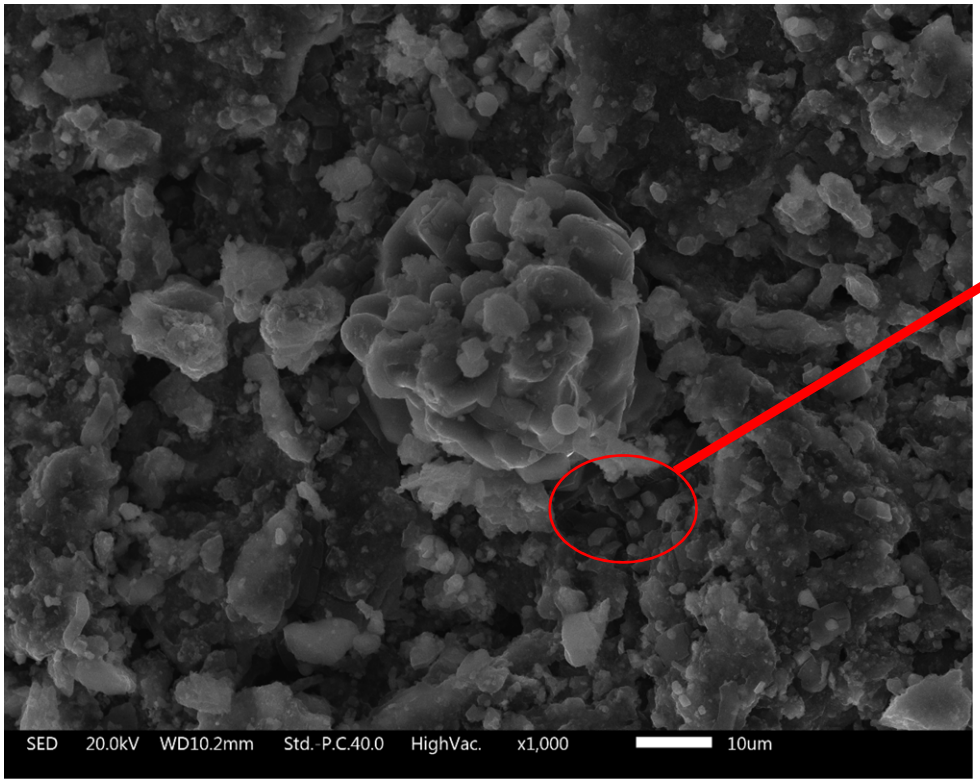
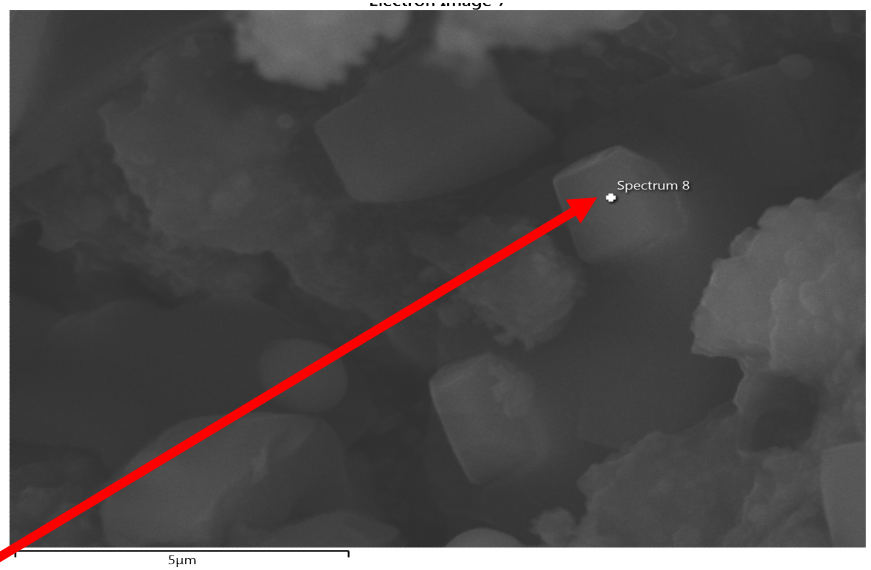


Fig. S11. SEM and EDS of dehydrogenated $2LiBH_4+Al/TiF_3$ at 3bar 400°C





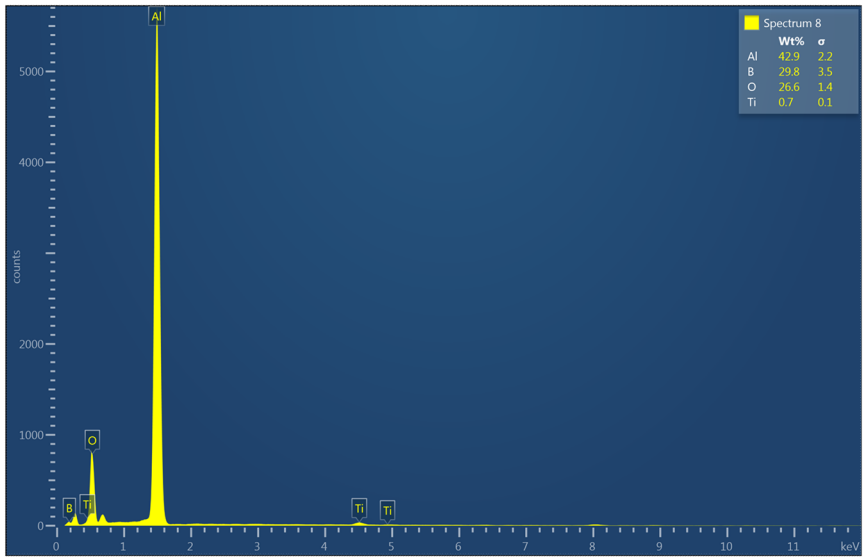
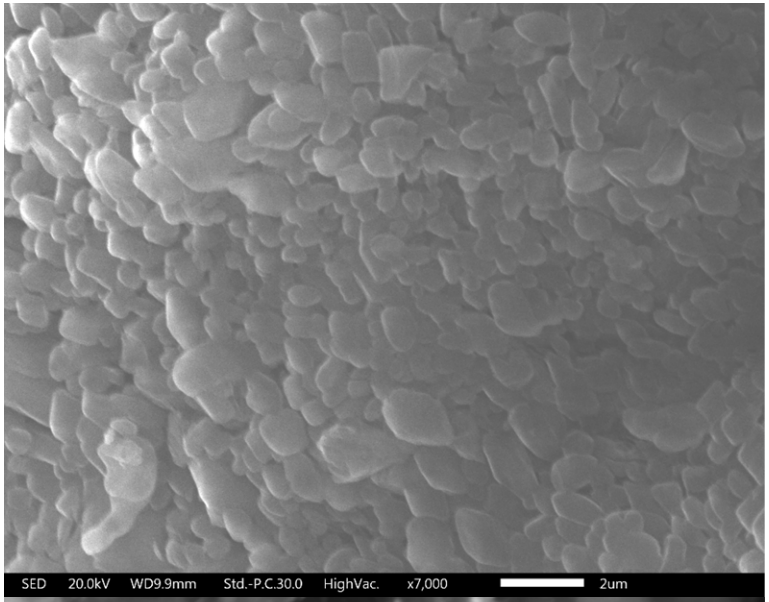
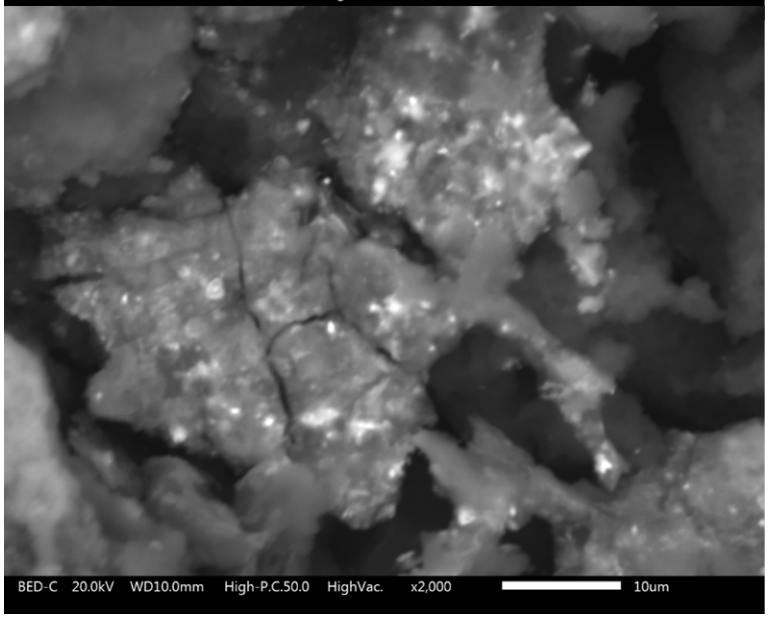
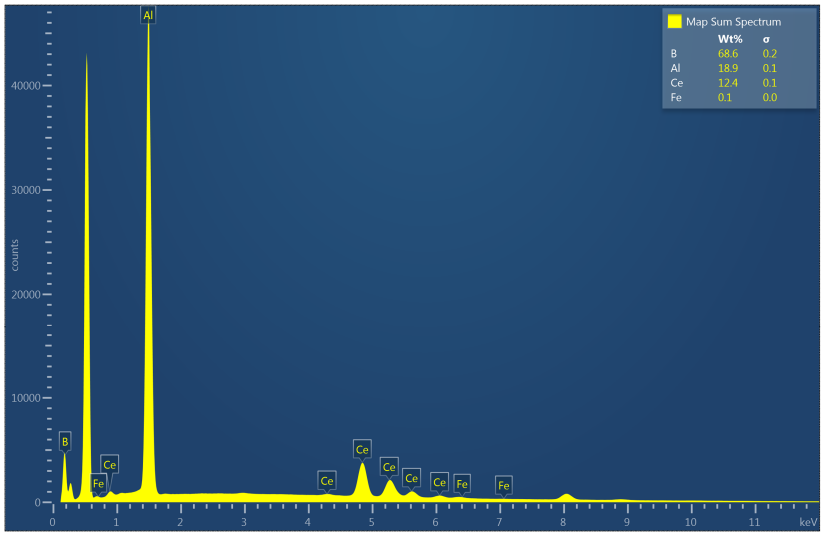


Fig. S12. SEM of dehydrogenated $2LiBH_4$+Al/CeO_2 DHH 5bar 400°C

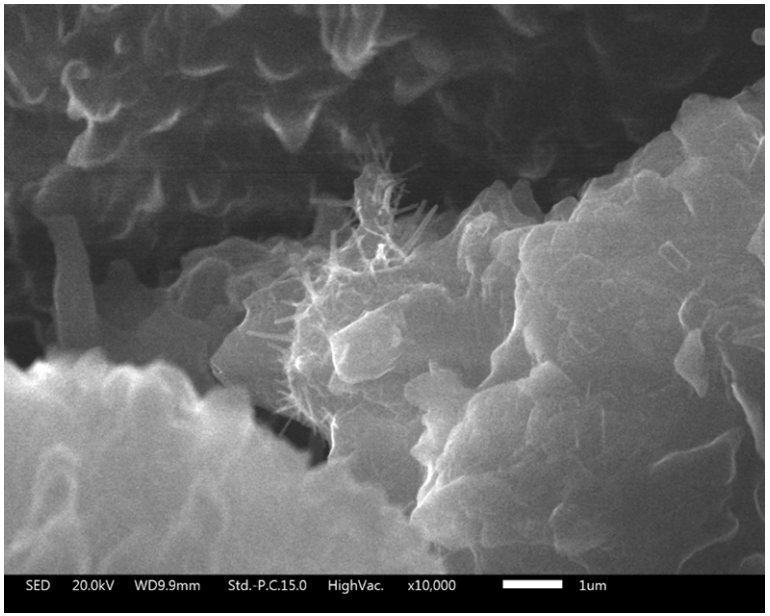


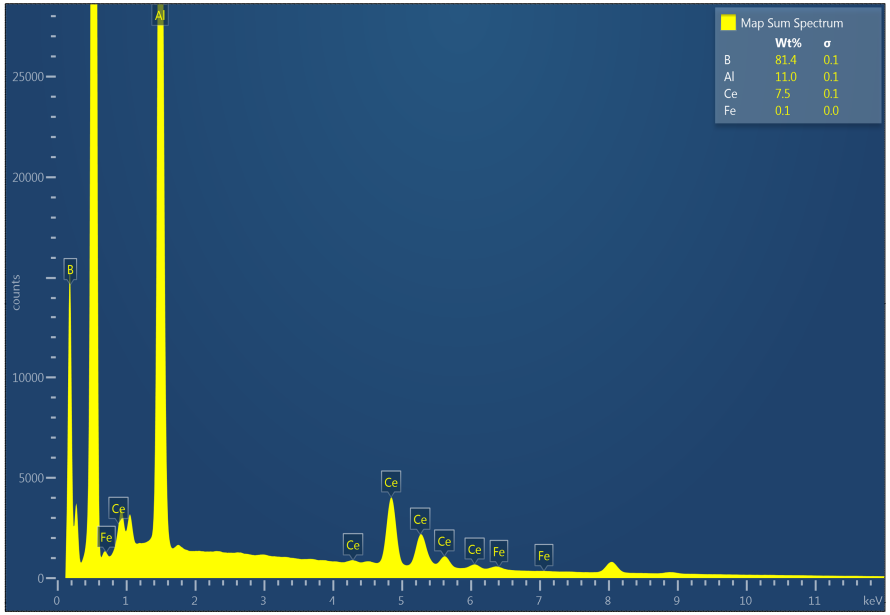


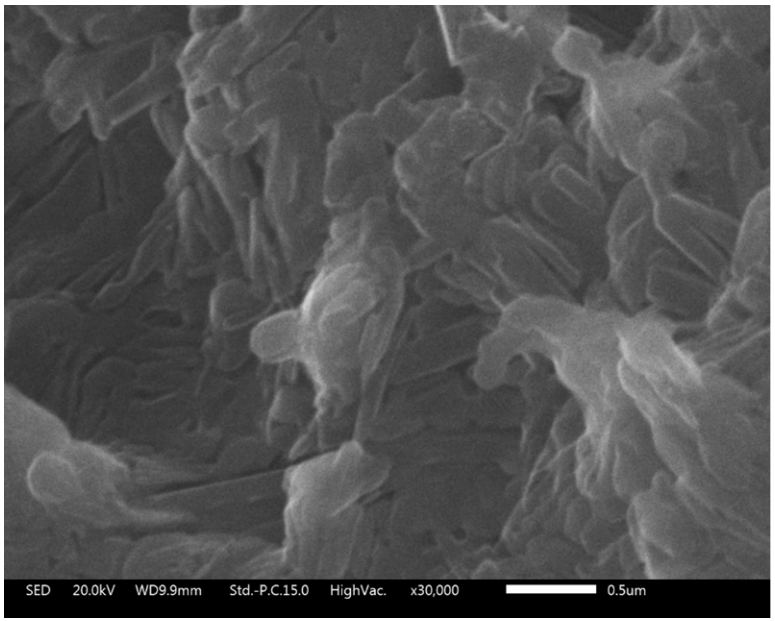


Element	Line Type	Wt%	Wt% Sigma	Atomic %
B	K series	68.61	0.25	88.93
Al	K series	18.87	0.15	9.80
Fe	K series	0.14	0.03	0.03
Ce	L series	12.38	0.12	1.24
Total:		100.00		100.00

Fig. S13. SEM of dehydrogenated $2LiBH_4$+Al/CeO_2 DHH 3bar 400°C







Element	Line Type	k Ratio	Wt%	Wt% Sigma	Atomic %
B	K series	0.33143	81.39	0.10	94.22
Al	K series	0.13543	10.96	0.06	5.08
Fe	K series	0.00180	0.13	0.02	0.03
Ce	L series	0.09322	7.51	0.06	0.67
Total:			100.00		100.00

Fig. S14. Dehydrogenation of $2LiBH_4+Al/CeO_2$ (3bar and 5 bar, 350°C)

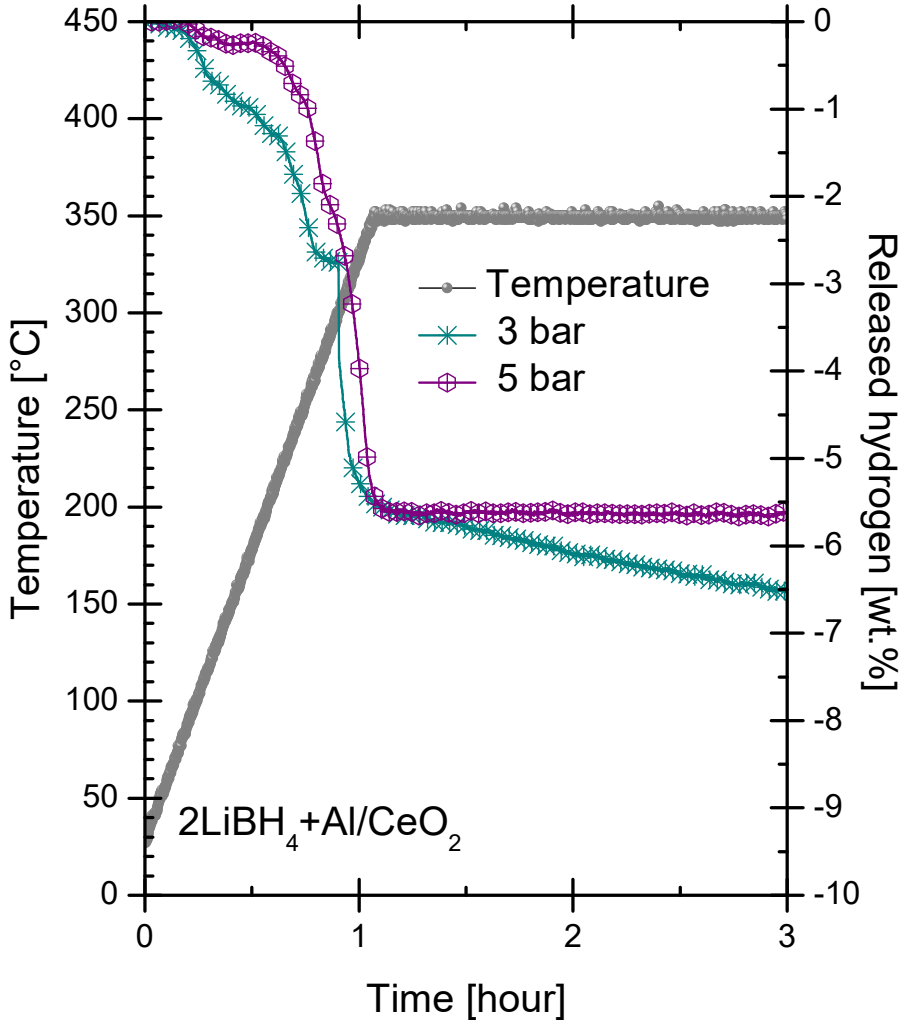
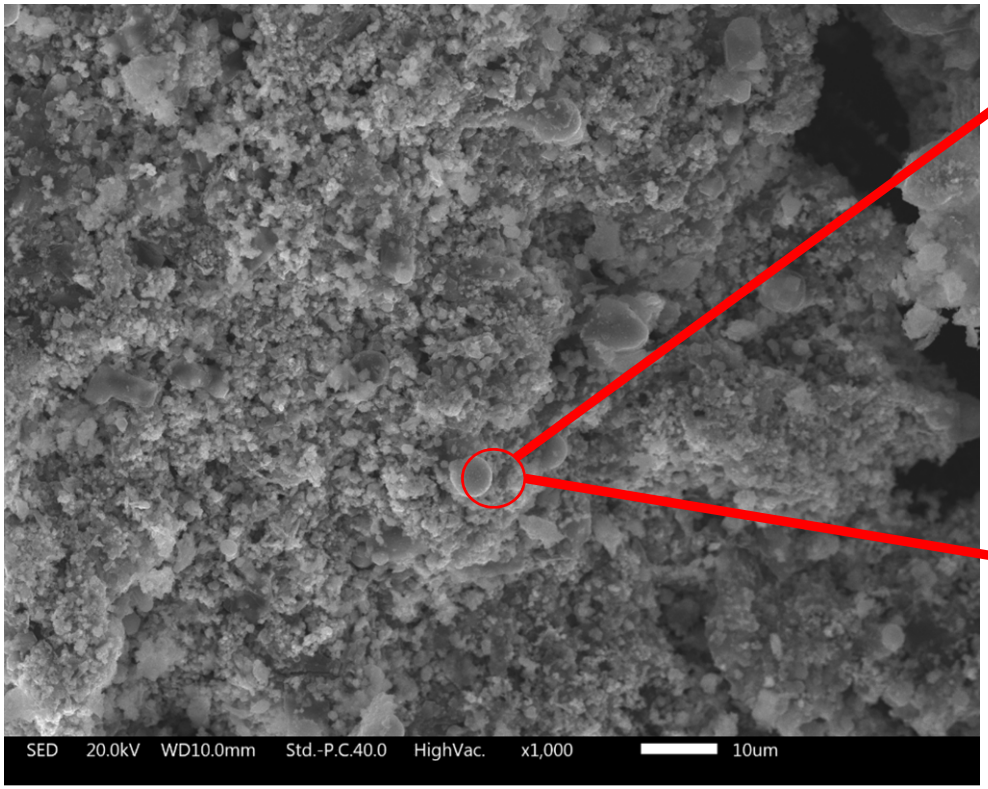
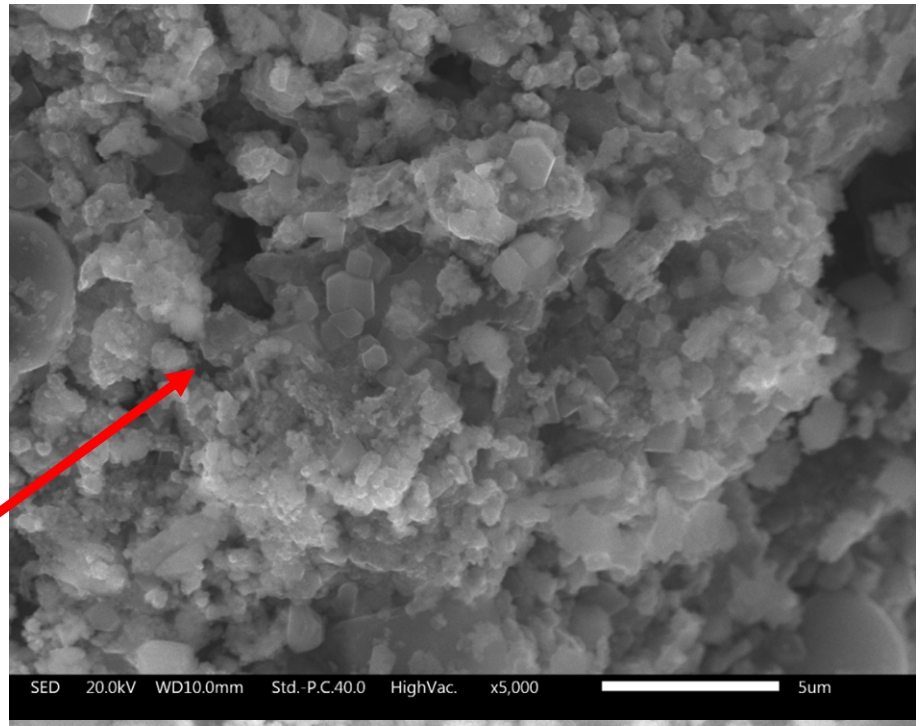
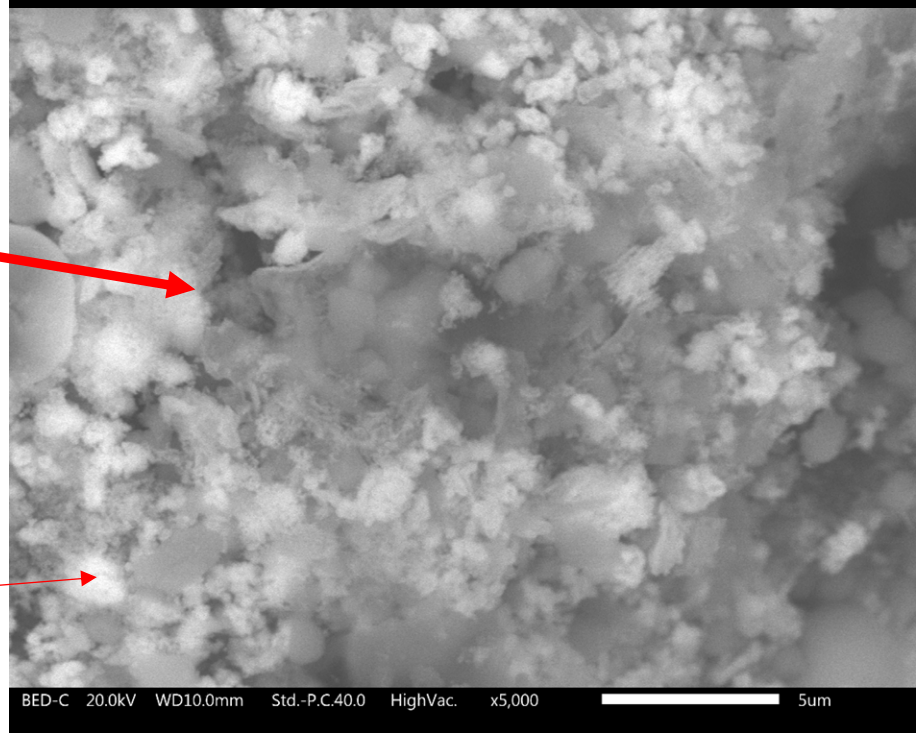


Fig. S15. SEM of dehydrogenated $2LiBH_4+Al/CeO_2$ DHH 5bar 350°C

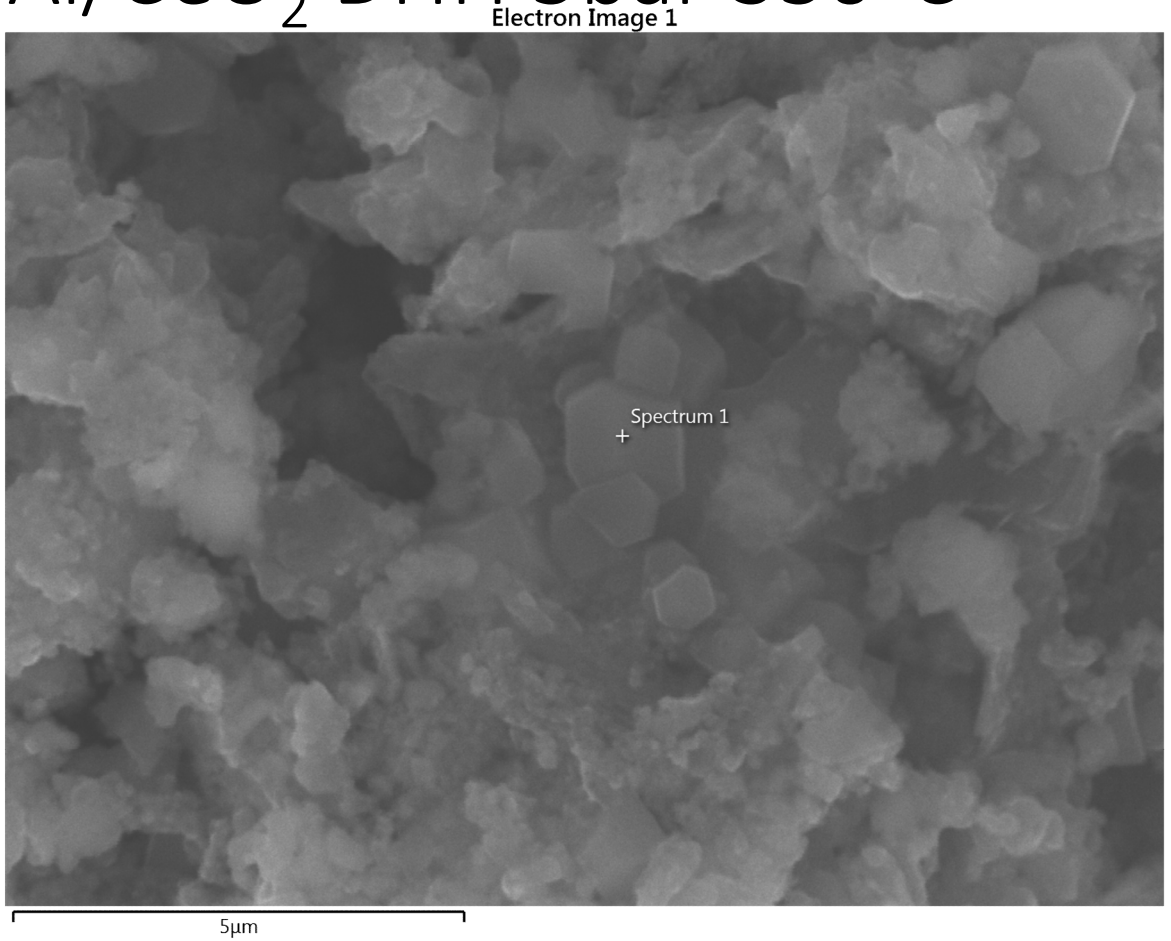






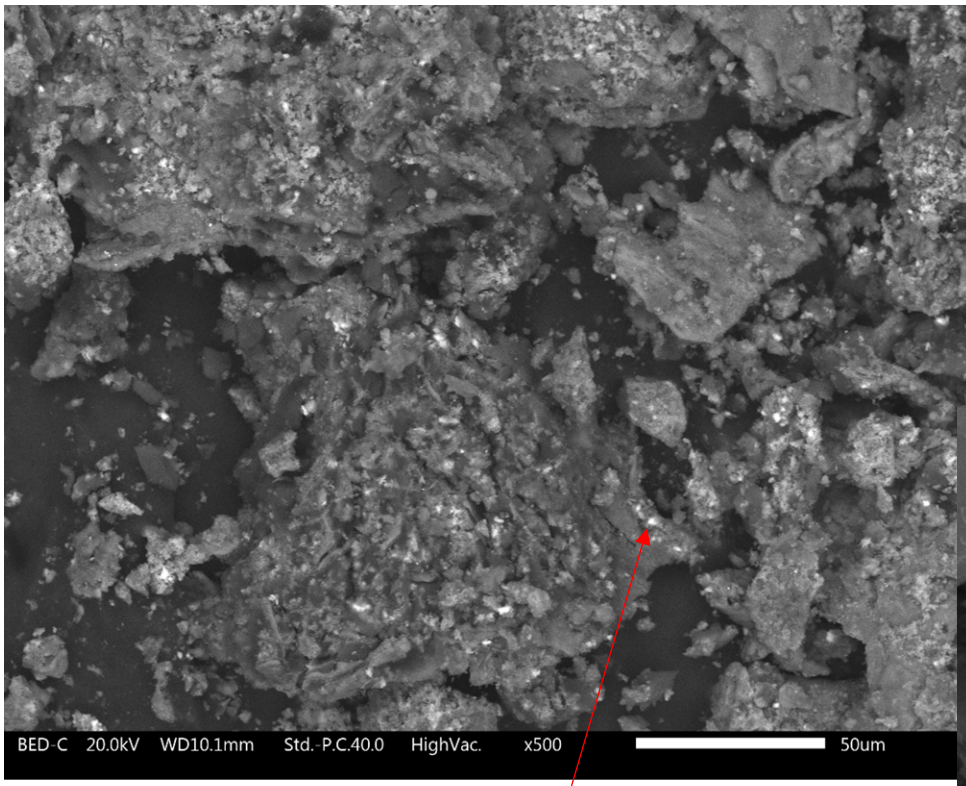
Ce-compound

Fig. S16. EDS of dehydrogenated $2LiBH_4+Al/CeO_2$ DHH 5bar 350°C



Element	Line Type	Wt%	Wt% Sigma	Atomic %
B	K series	40.12	1.55	56.91
O	K series	30.83	0.85	29.55
Al	K series	22.58	0.61	12.83
Ce	L series	6.46	0.26	0.71
Total:		100.00		100.00

Fig. S17. SEM of dehydrogenated $2LiBH_4+Al/CeO_2$ at 3bar and 350°C



Ce-compound