Supplementary Material

The enhanced thermal stability and reduced hygroscopicity of aluminum hydride coated with Vinyltrimethoxysilane.

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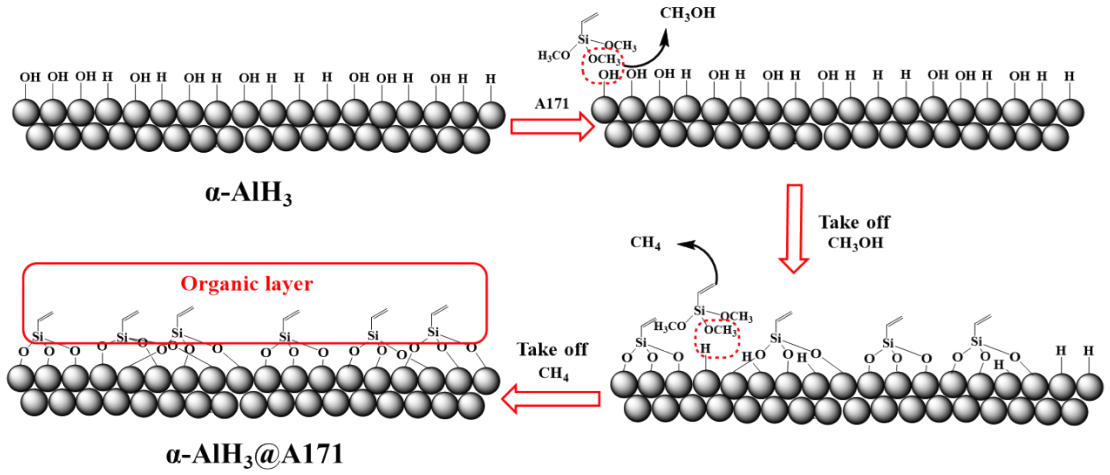

Fig. S1 Reaction process of A171 with α-AlH_3 surface and formation of organic layer.

Table S1 The XPS analysis of the specific atomic content of C, O, Al and, Si elements in the α-AlH_3 and α-AlH_3@A171 composite.

	C element (atomic content %)	O element (atomic content %)	Al element (atomic content %)	Si element (atomic content %)
α-AlH_3	1.55	54.34	44.41	0
α-AlH_3@A171	26.22	38.54	26.35	8.89

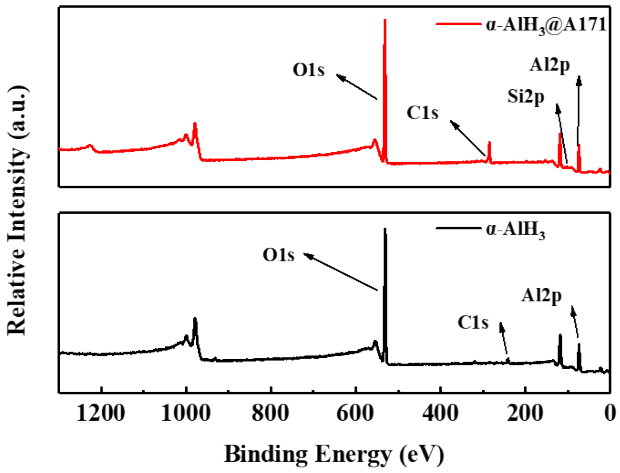

Fig. S2 The XPS full spectrum of the α-AlH_3 and α-AlH_3@A171 composite.

Section 2. SEM images and size distribution of α-AlH_3 and α-AlH_3@A171 composite.

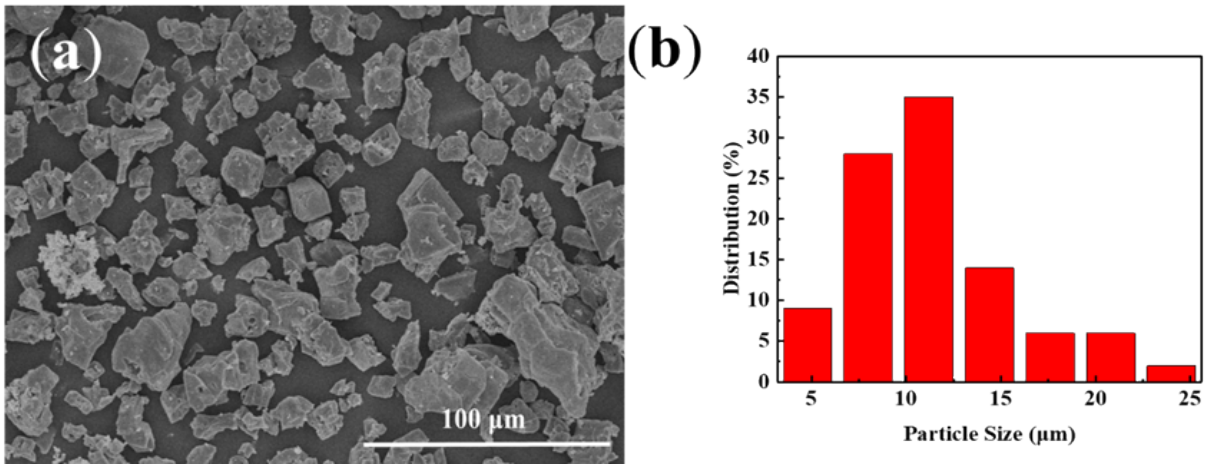

Fig. S3 SEM image (a) and size distribution (b) of α-AlH_3.

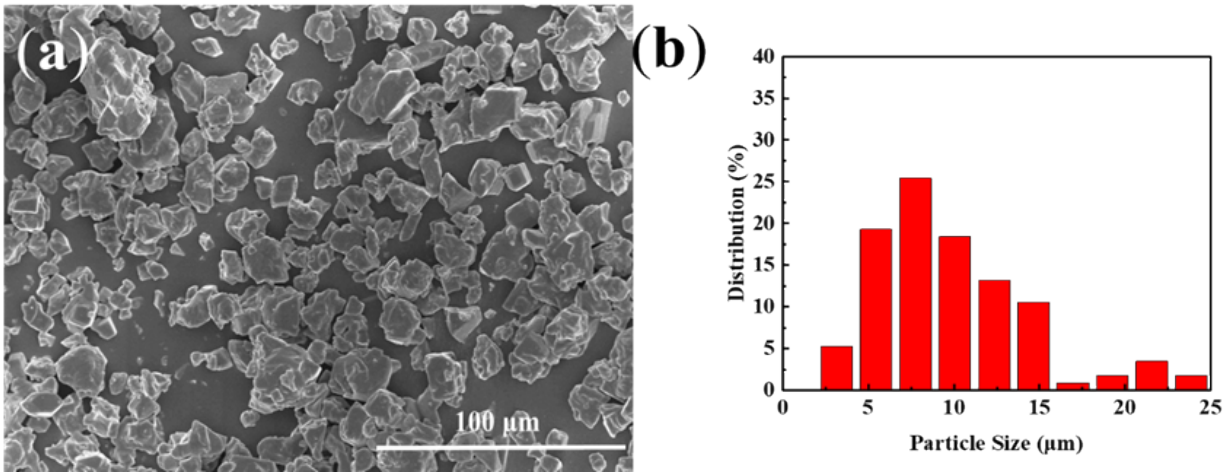

Fig. S4 SEM image (a) and size distribution (b) of α-AlH_3@A171 composite.

Section 3. TEM image of α-AlH_3 and α-AlH_3@A171 composite.

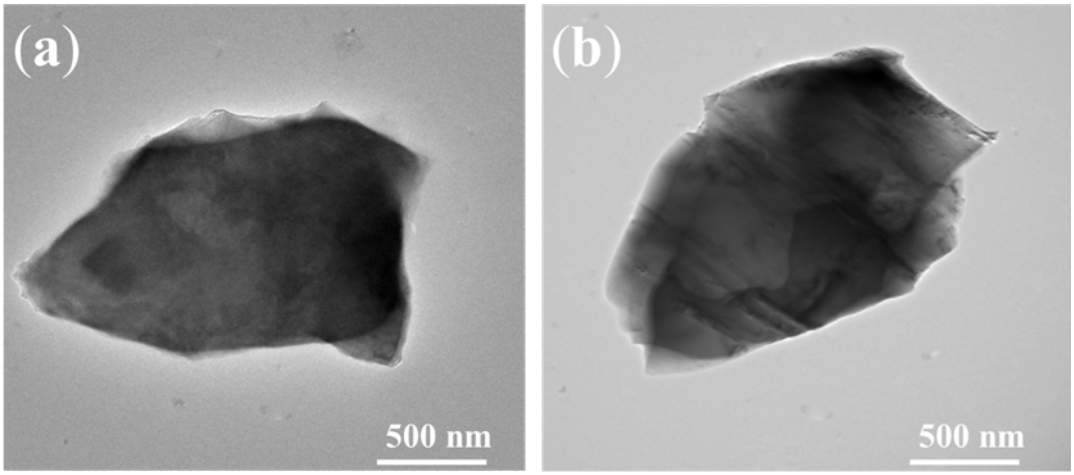

Fig. S5 TEM image of α-AlH_3 (a) and α-AlH_3@A171 composite (b).

Section 4. EDS mapping of Al, Si, C and O in α-AlH_3.

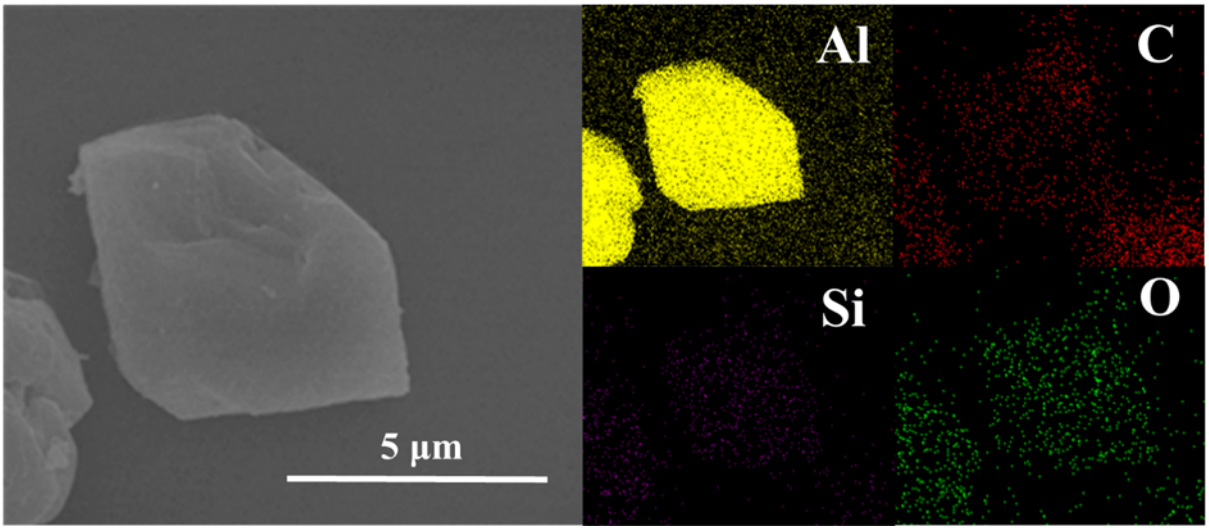

Fig. S6 EDS mapping of Al, Si, C, and O in α-AlH_3.

Section 5. TG/DSC curves of α-AlH_3.

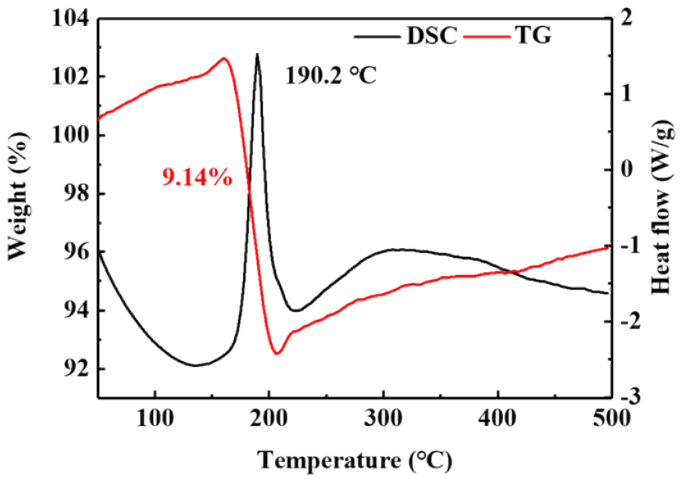

Fig. S7 TG/DSC curves of the α-AlH_3.

Section 6. Photographs of α-AlH_3 and α-AlH_3@A171 composite before hygroscopicity.

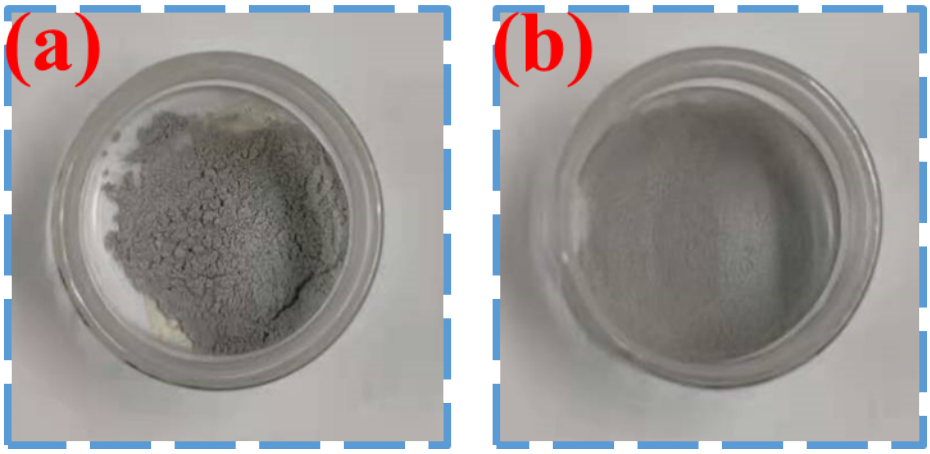

Fig. S8 Morphology before the moisture absorption of the α-AlH_3 and α-AlH_3@A171 (30 ℃, RH 80%).

Section 7. Photographs of α -AlH_3 and α-AlH_3@A171 composite were placed in water for 30 min.

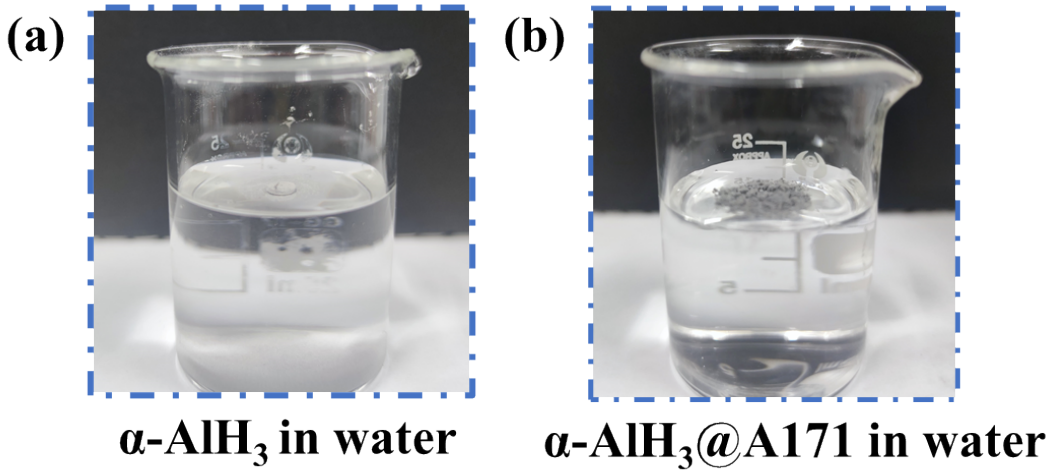

Fig. S9 Photographs of the α-AlH_3 and α-AlH_3@A171 were placed in water (25 ℃) for 30 min.