

Supplementary Information

Low-Temperature Synthesis of α -Al₂O₃ via Endotaxial Transformation from Sodium Meta-Aluminate

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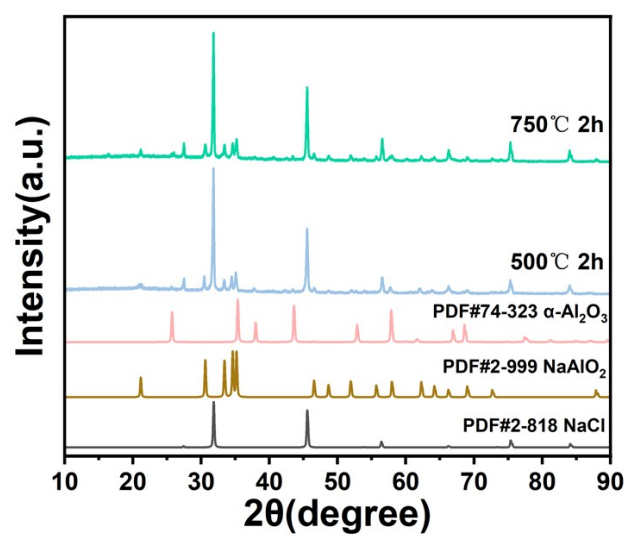


Fig. S1. XRD patterns of the products obtained after the reaction between NaAlO_2 and CCl_4 for 2 hours at different temperatures.

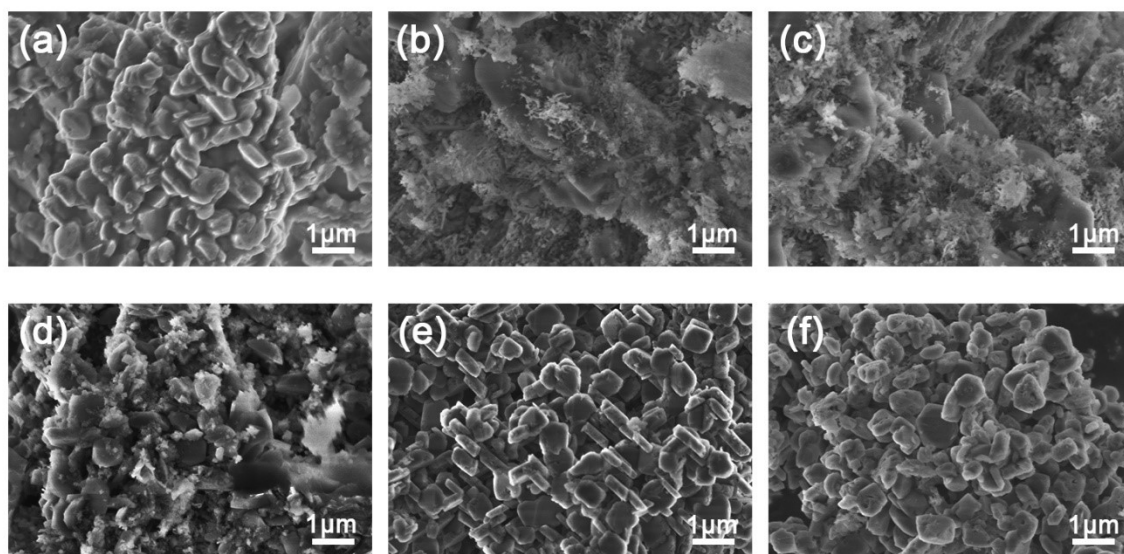


Fig. S2. SEM images of (a) NaAlO_2 prior to the reaction and the products obtained after the reaction with CCl_4 at 500°C (b), 750°C (c), 800°C (d), 850°C (e), and 900°C (f) for 2 hours.

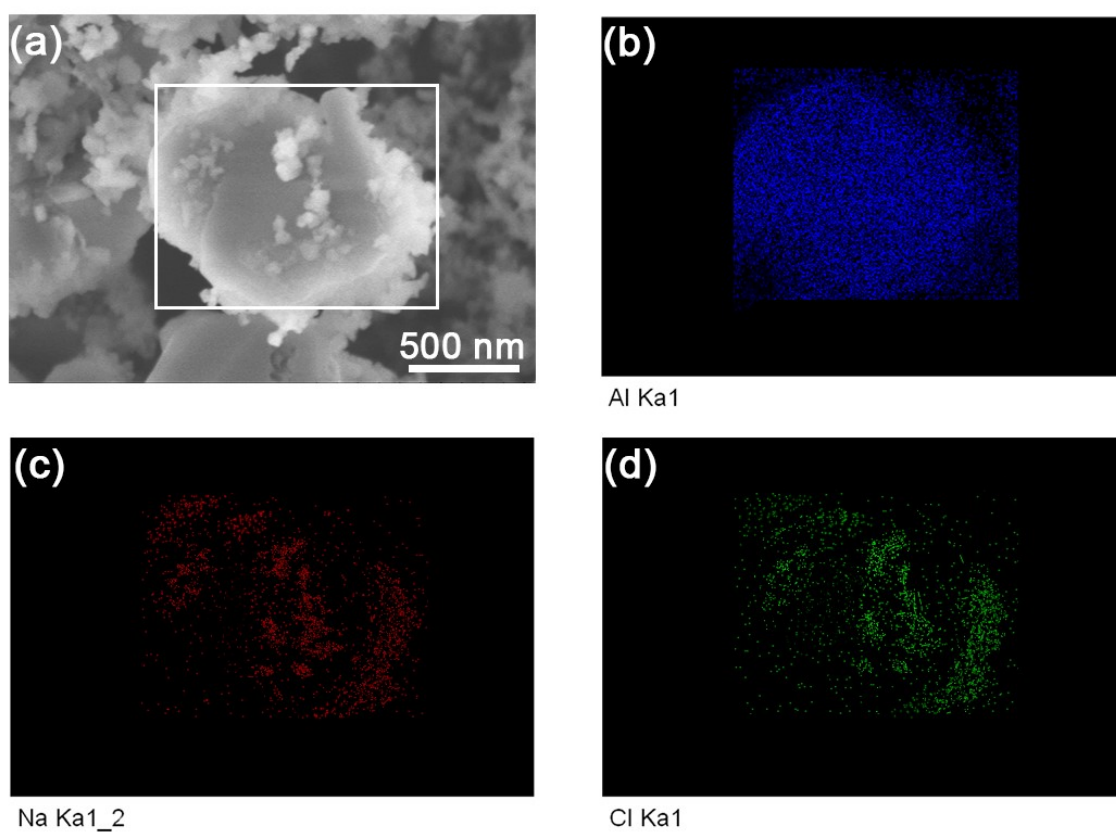


Fig. S3. (a) SEM image of the sample synthesized at 850°C for 1 hour, with the specific region subjected to EDS mapping analysis marked. (b)-(d) Corresponding mapping results of the selected region in (a), revealing the elemental distribution characteristics.

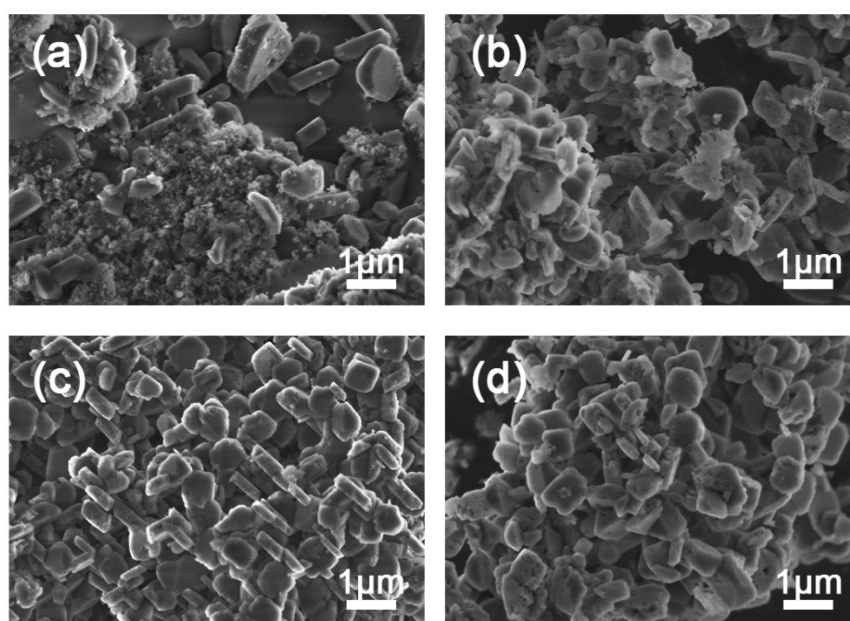


Fig. S4. SEM images of NaAlO₂ reacted with CCl₄ at 850°C for 2 hours under Ar flow rates of 80 sccm (a), 100 sccm (b), 120 sccm (c), and 140 sccm (d).

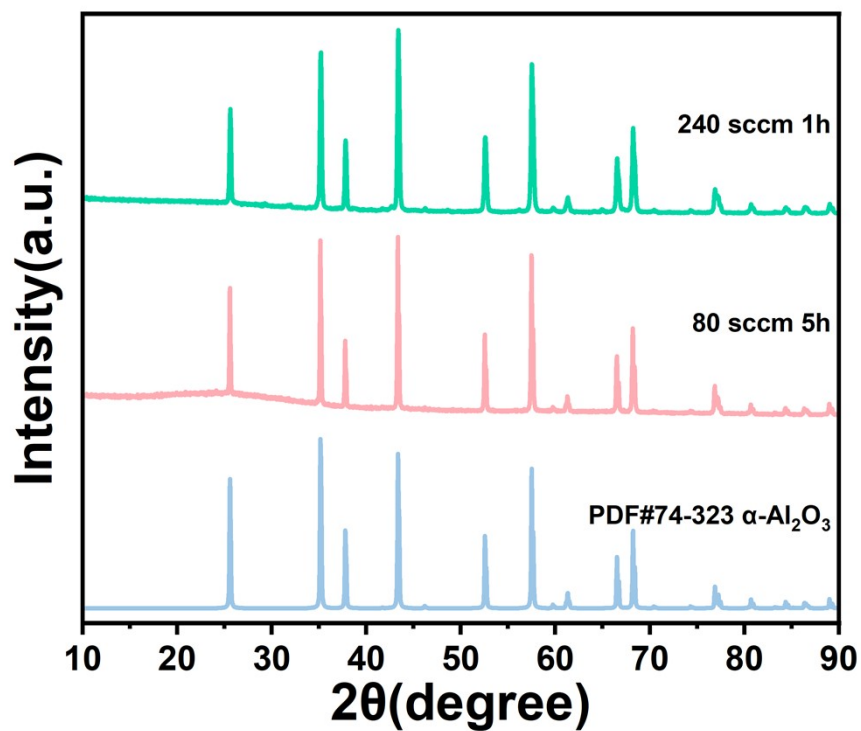


Fig. S5 XRD patterns of the products obtained from the reactions between NaAlO₂ and CCl₄ at 850°C under two different conditions: (1) 5-hour reaction with an Ar flow rate of 80 sccm, and (2) 1-hour reaction with an Ar flow rate of 240 sccm.

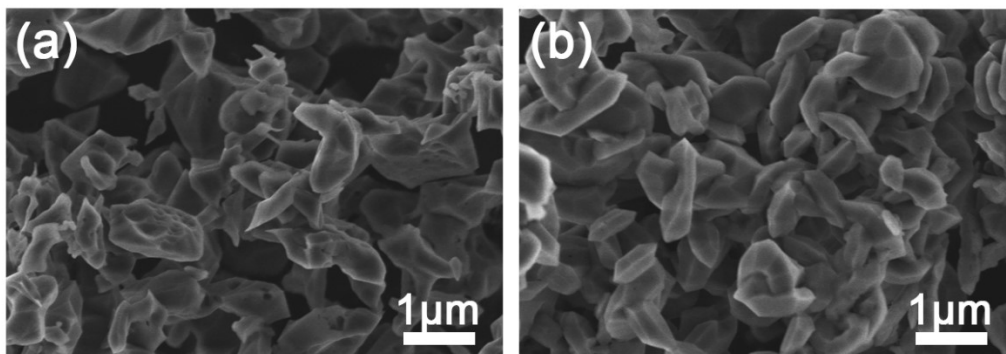


Fig. S6 SEM images of the products obtained from the reactions between NaAlO₂ and CCl₄ at 850°C under two different conditions: (1) 5-hour reaction with an Ar flow rate of 80 sccm, and (2) 1-hour reaction with an Ar flow rate of 240 sccm.

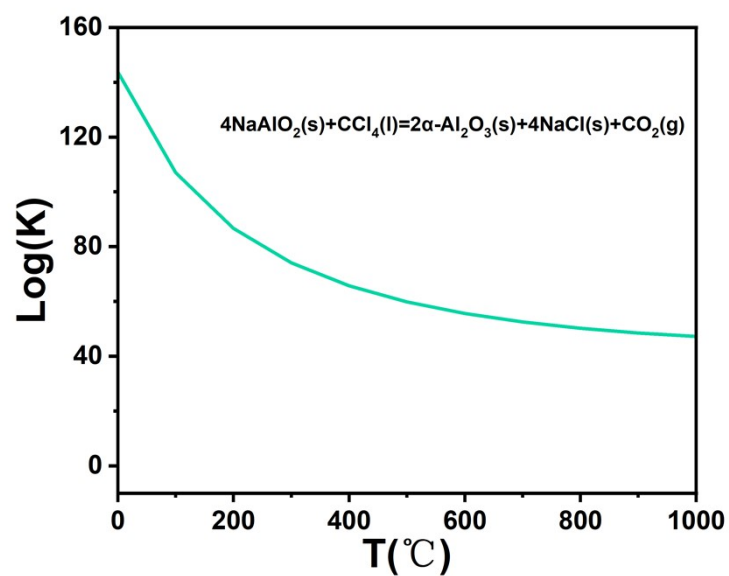


Fig. S7 Equilibrium constant of NaAlO_2 in the absence of CCl_4 .

Table S1. ICP was used to measure the content of metal Na in different conditions.

Sample	The content of Na(wt.%)
The sample obtained at an Ar flow rate of 120 sccm and 850°C for 2 hours	0.23
After washing the sample with deionized water	0.13