

## Supporting Information

### Influence of $\gamma$ -AlOOH Morphology on Composite Separator

### Performance for Lithium-Ion Batteries

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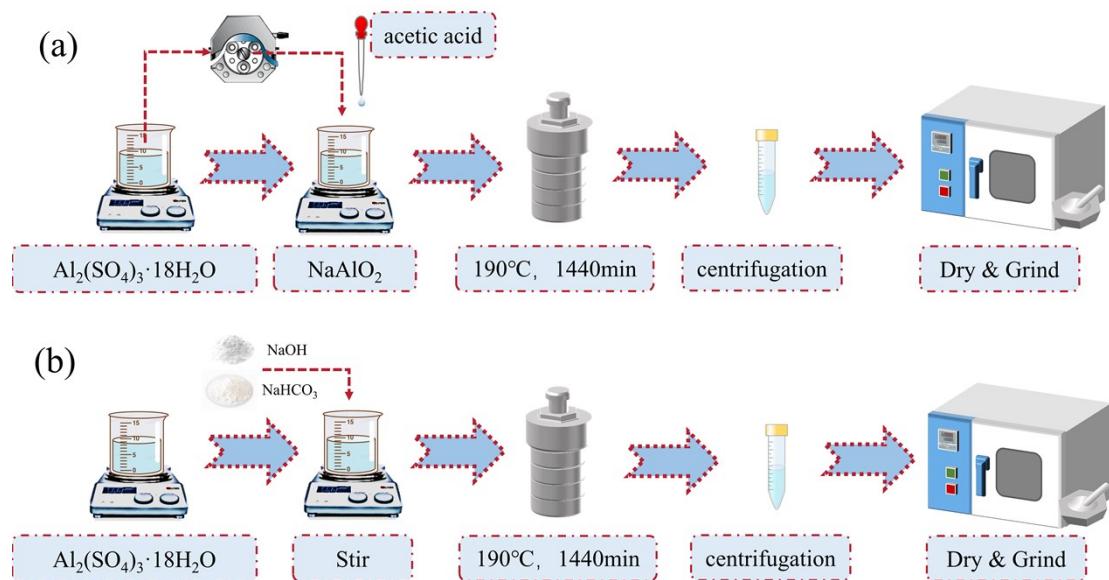


Figure S1 Preparation of  $\gamma$ -AlOOH with Different Morphology: (a)  $\gamma$ -AlOOH nanorods, (b)  $\gamma$ -AlOOH nanosheets

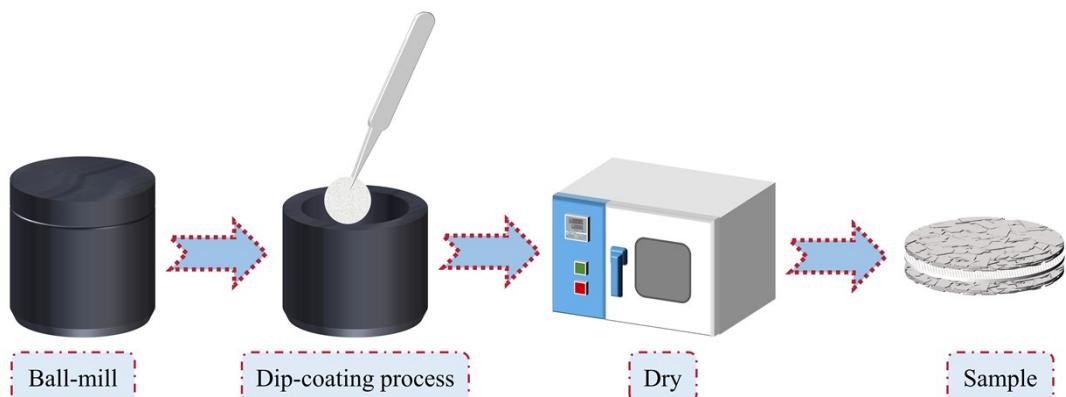


Figure S2 Preparation of  $\gamma$ -AlOOH-coated Celgard separator

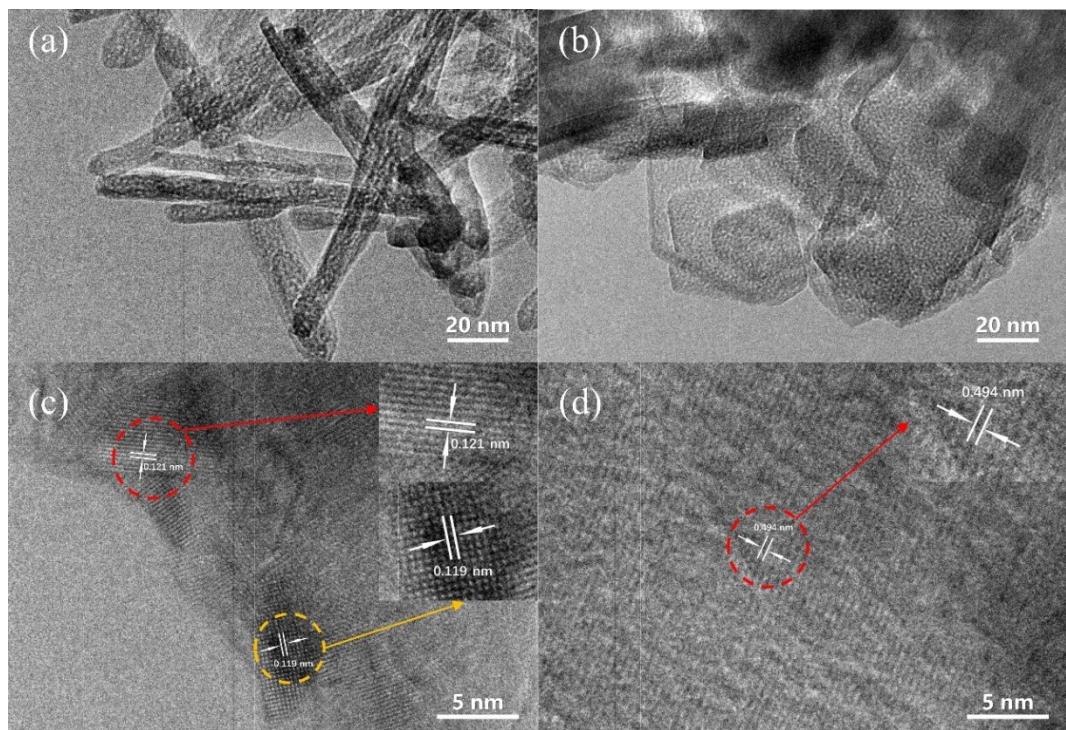


Figure S3. TEM and HRTEM images of  $\gamma$ -AlOOH with different morphologies: (a, c)  $\gamma$ -AlOOH nanorod, (b, d)  $\gamma$ -AlOOH nanosheet

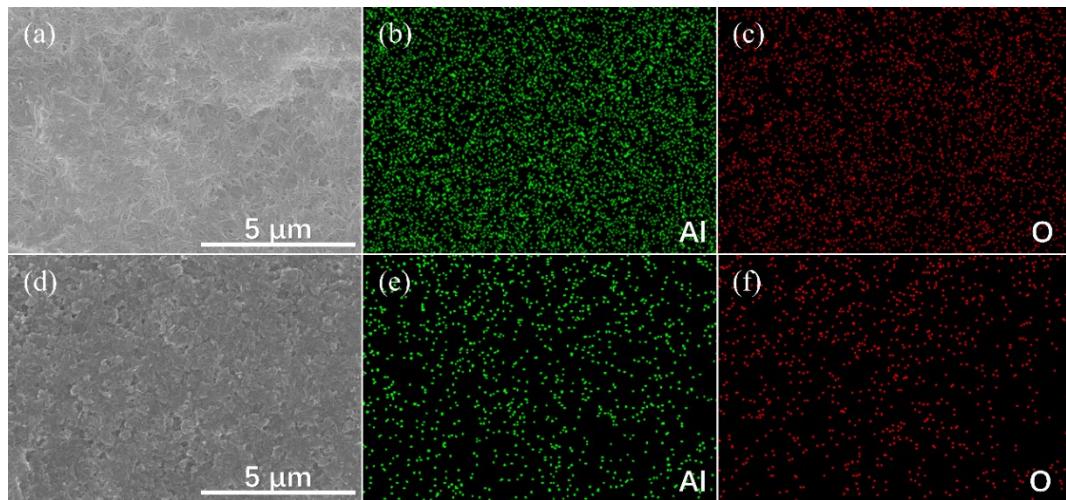


Figure S4 EDS elemental mapping of the  $\gamma$ -AlOOH-coated separators: (a-c) Celgard2325-nanorod, (d-f) Celgard2325-nanosheet

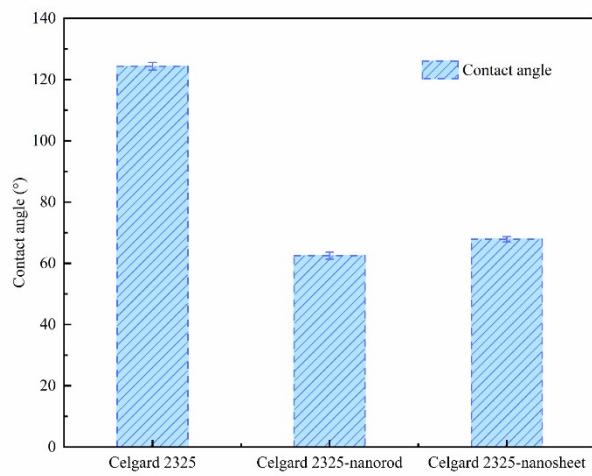


Figure S5 Electrolyte wettability of different separators

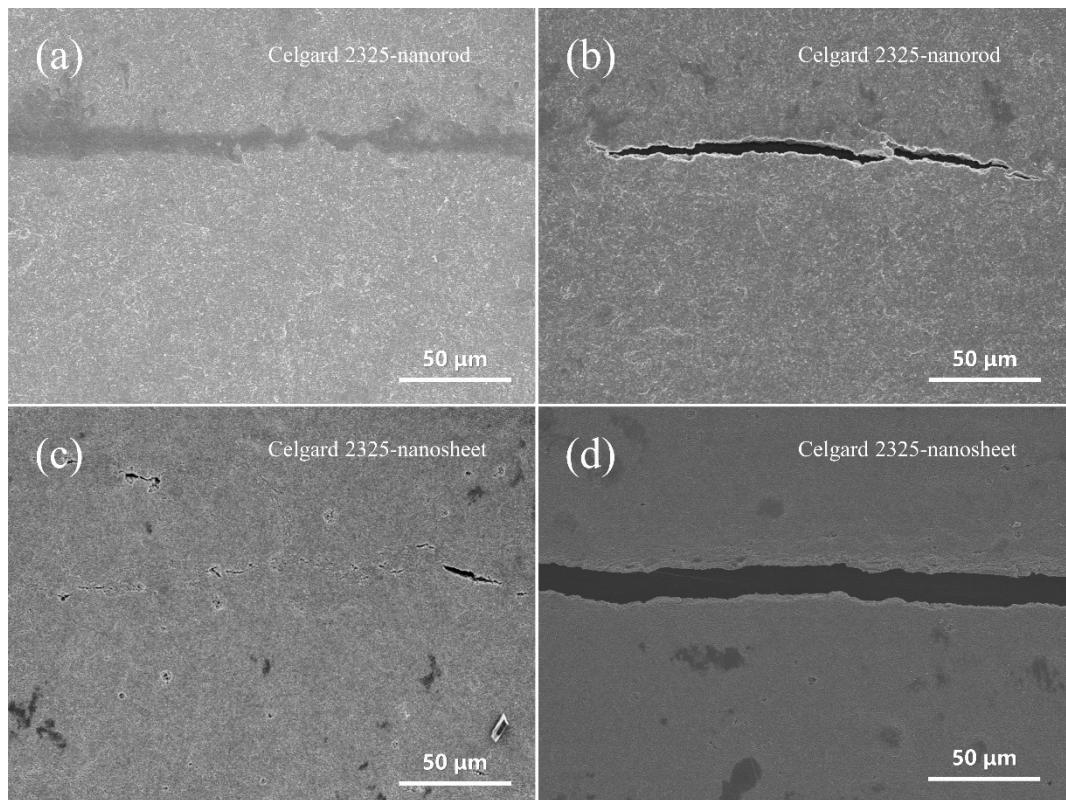


Figure S6 Repeated folding test of the separators: (a, c)100 times, (b, d)300 times

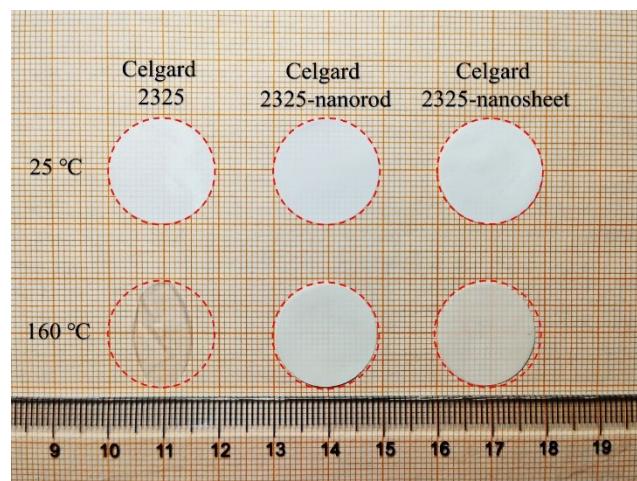


Figure S7 pictures after heat treatment at 25 °C, 160 °C for 1 h of separators.