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Supporting Information

Growth of Well–Developed LaOCl Microplates by Chloride Salt–assisted Method

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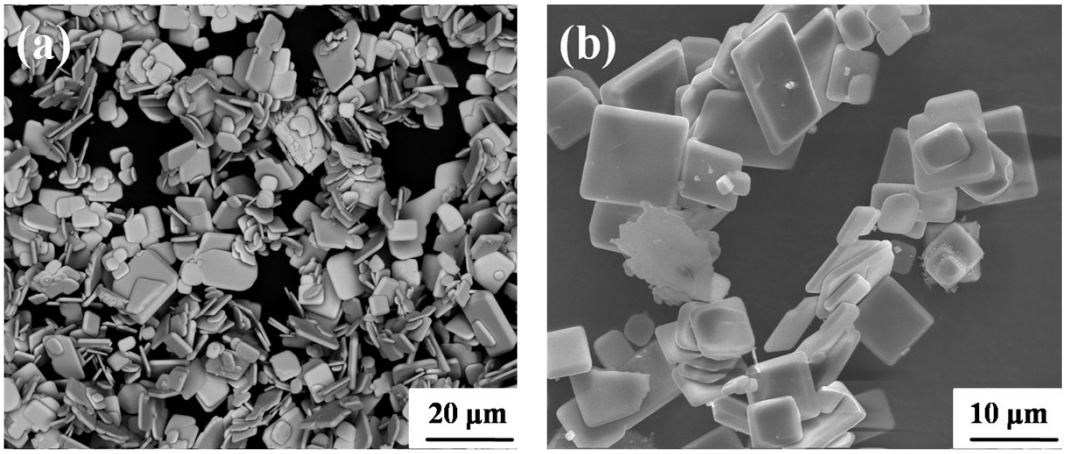


Figure S1 FE–SEM images of samples resultant from 3 h firing at 800°C in (a) KCl–LiCl; (b) LiCl. It can be clearly observed that the LaOCl particles both exhibited the plate–like structure with the similar thickness and width.

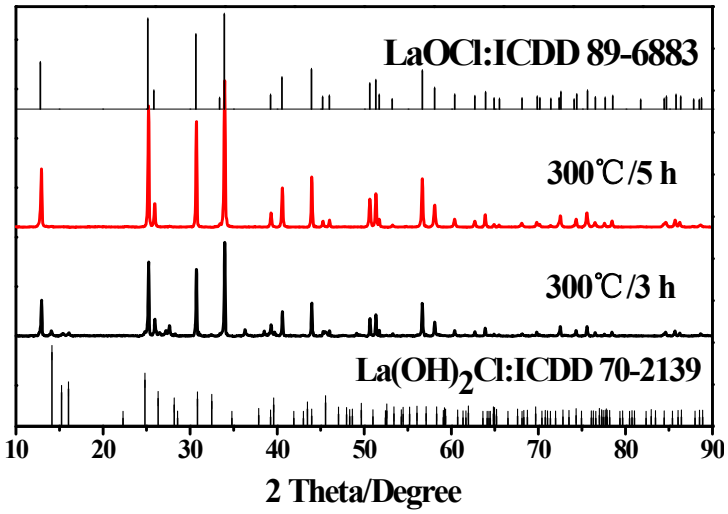
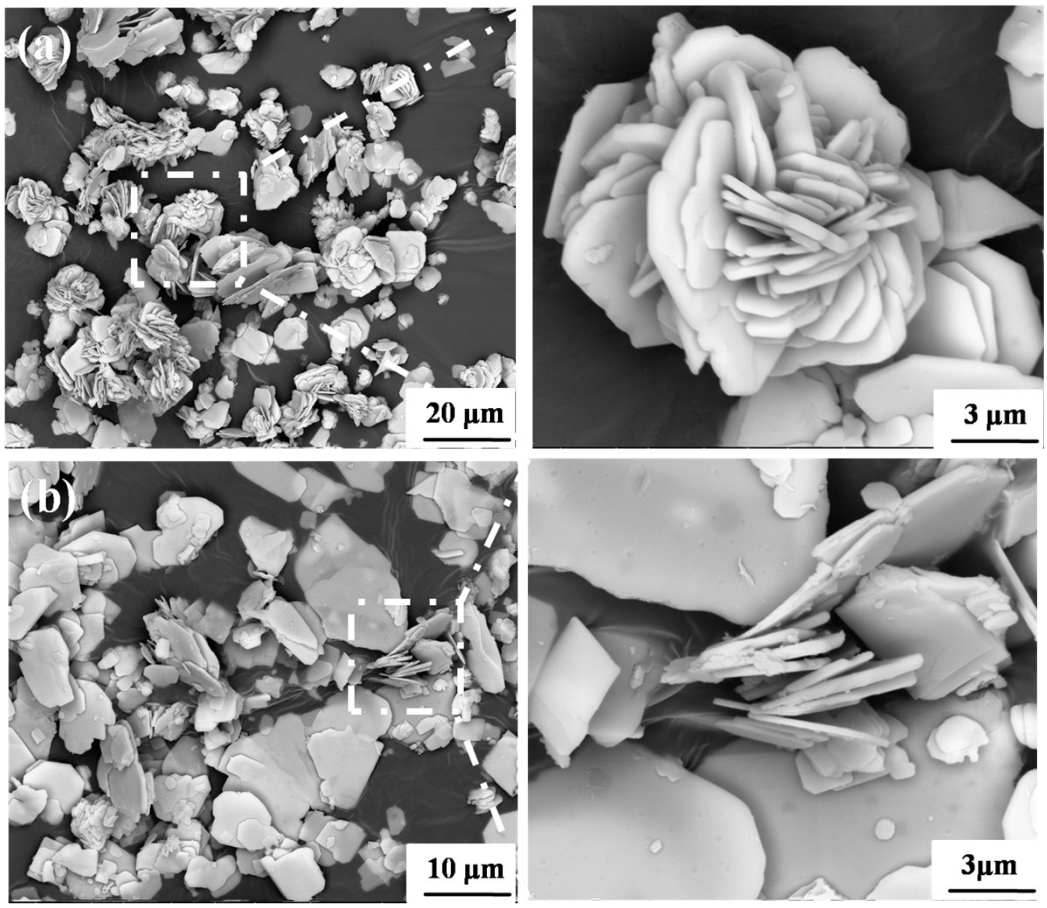


Figure S2 XRD patterns of the LaOCl prepared in KCl–LiCl at 300°C with the different holding temperatures. It showed prolonging the holding time to 5 h can result in the formation of phase pure LaOCl at 300°C.



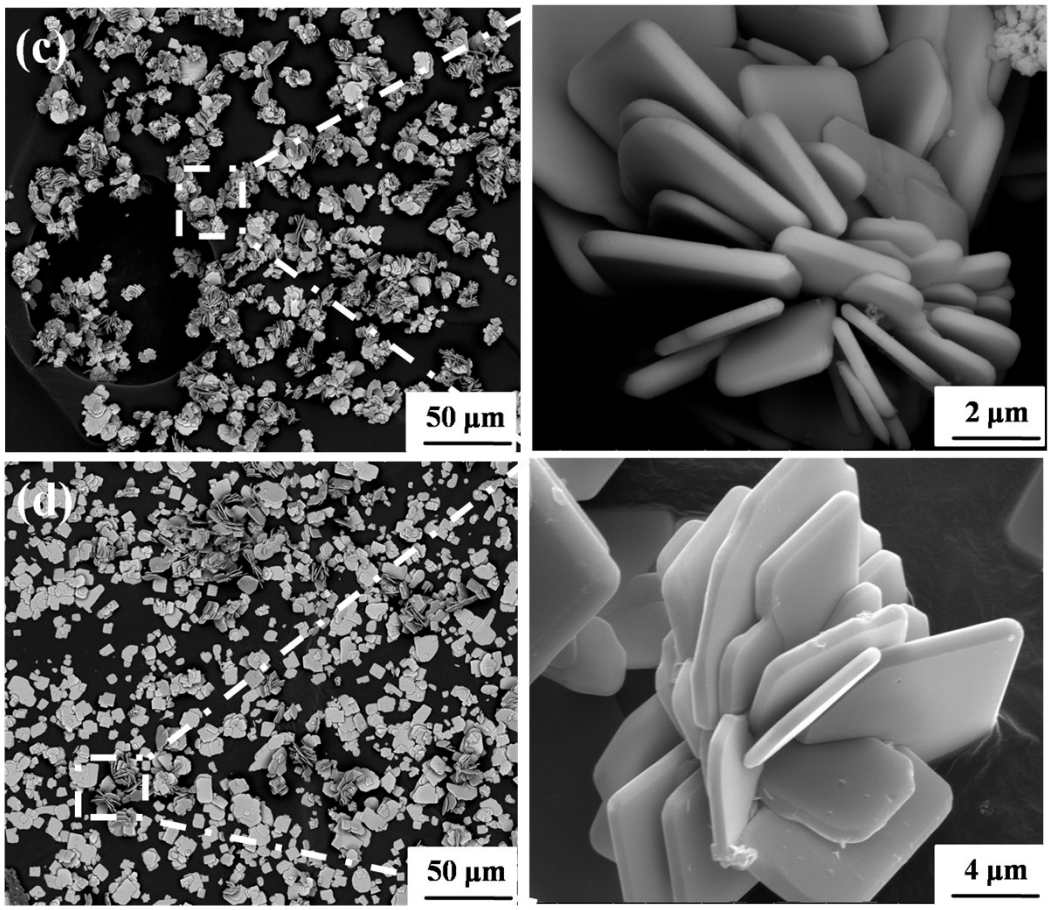


Figure S3 FE–SEM images of the samples firing at various temperatures in KCl-LiCl: (a) 400°C; (b) 500°C; (c) 600°C; (d) 700°C. These results demonstrated that the higher temperature led to a rapid growth of the LaOCl micro-crystalline with thick thickness and the highly dispersed LaOCl microplates. Moreover in all above samples, the helical topology of LaOCl can be clearly observed.

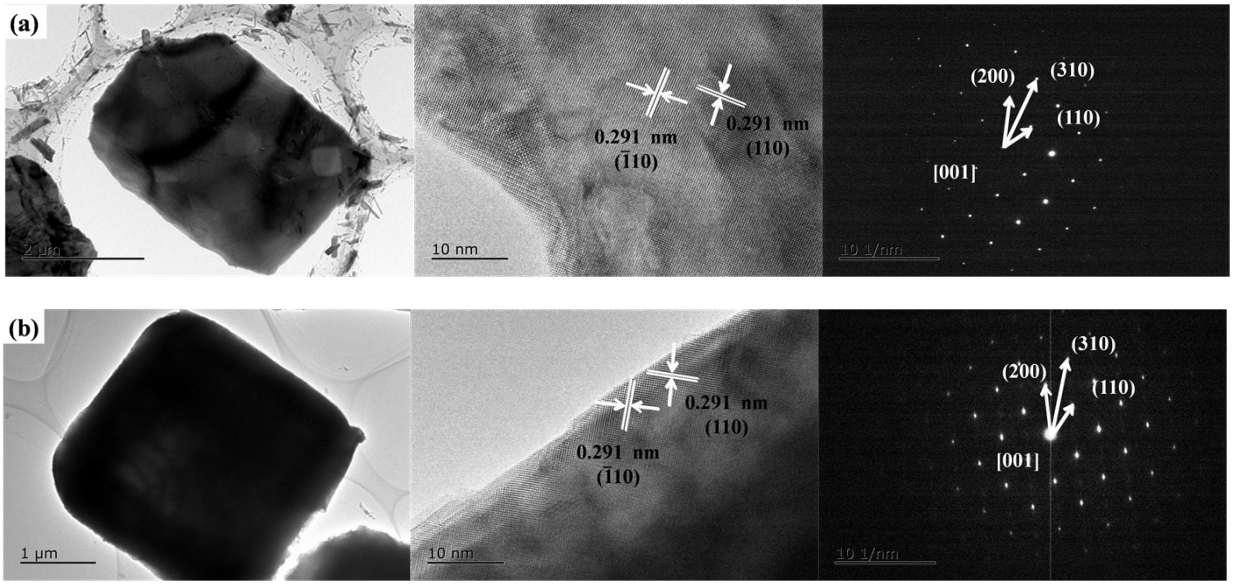


Figure S4 TEM, HRTEM and SAED images of the LaOCl prepared in KCl-LiCl at (a) 350 °C and in (b) LiCl at 800 °C. Both of these two samples exhibited the (001) preferential orientation.

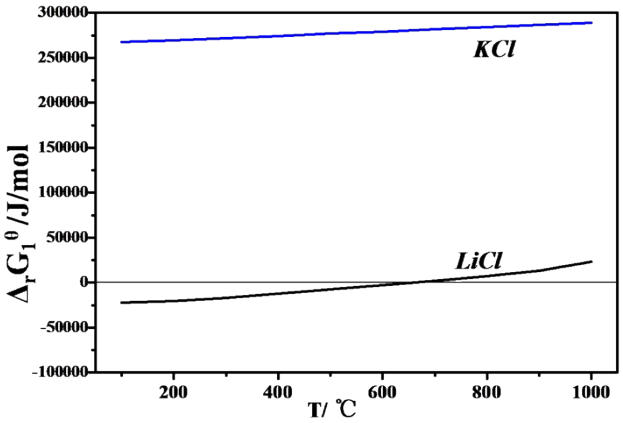


Figure S5 Temperature dependence of $\Delta_r G_1^\theta$ of reaction (1). It indicates that Reaction (1) could occur at test temperatures only when LiCl as the starting chloride.

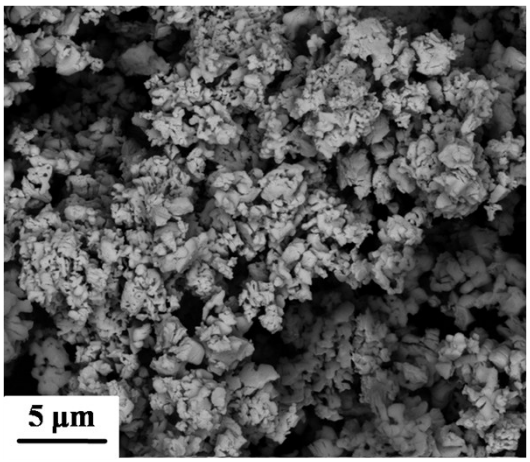


Figure S6 FE–SEM images of the raw La_2O_3 powders. It showed the La_2O_3 had a spongy–like structure with the average size of about 1 μm, which was completely different to the as–prepared LaOCl microplate.

Table S1. Comparison of the firing condition and morphology of present LaOCl microplates and some LaOCl powders in published literatures. Interestingly, we found there is no report of the well-developed LaOCl plates in the published literatures. In most case, completely no or only small amount of the obtained LaOCl powders had the plate–like structures. The comparisons indicated that the present method provided the good growth condition for the formation of LaOCl plates.

Reference	Method	Reaction Temperature	Morphology and Size
[5, 10]	Sol–gel	600–800°C	Nanoparticle; Nanostick, Size: hundreds of nanometers
[11]	Precipitation	550°C	Not shown
[12]	Combustion	500°C*	Thin flakes with a little amount of the spherical particles, Size: several microns
[8, 13, 14]	Electrospinning	700–900°C*	Nanofibers, Diameter: 200–500 nm
Present paper	Chloride salt–assisted method	300°C	Microplates, Side length: several microns; Thickness: 200–500 nm

*The reaction temperature refers to the subsequent calculation treatment after the fabrication.