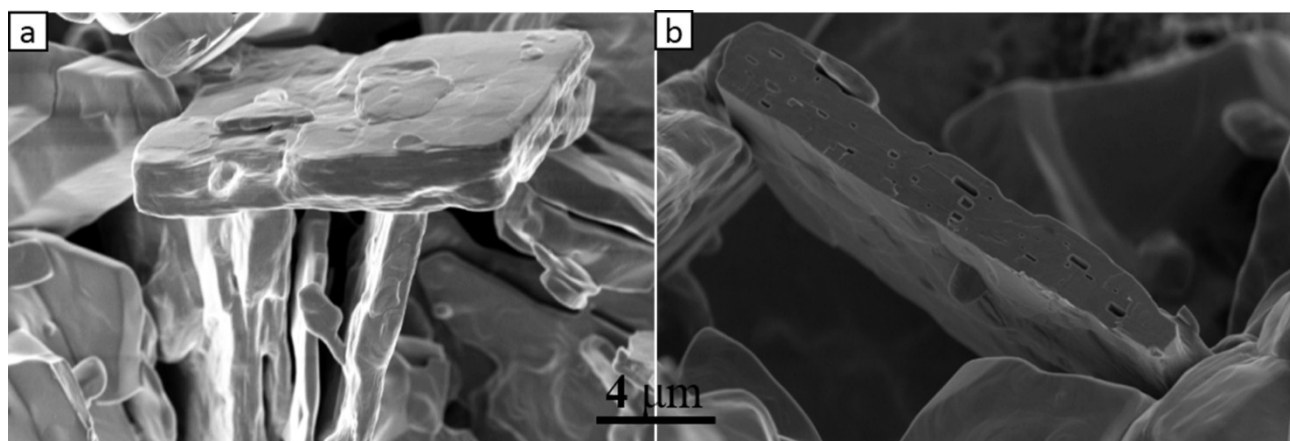


## Supplementary Information

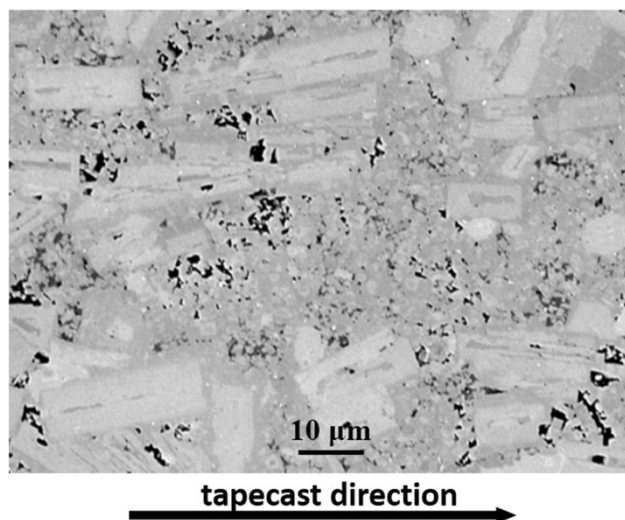
of

### Mechanistic Interpretation of the Reactive Templated Grain Growth Process of (Li, Ta, Sb) modified (K, Na)NbO<sub>3</sub> Textured Lead-free Piezoceramics

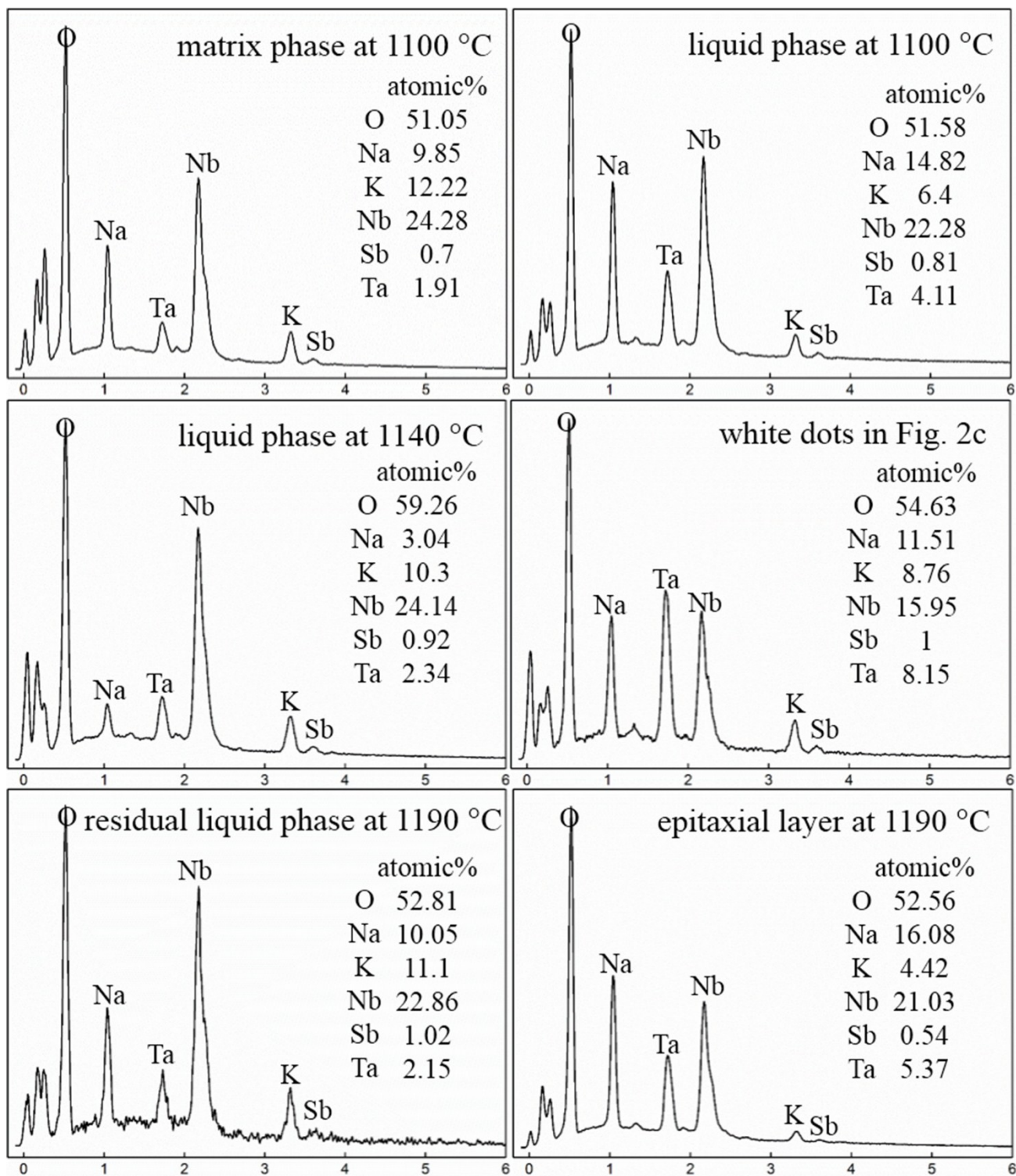
Zhengqian Fu, Zhiqiang Zhang, Ping Lu, Linlin Zhang, Heliang Yao, Fangfang Xu,\* and Yongxiang Li\*



**Fig. S1.** SEM images of NaNbO<sub>3</sub> templates, showing rectangular pores in some template crystals.

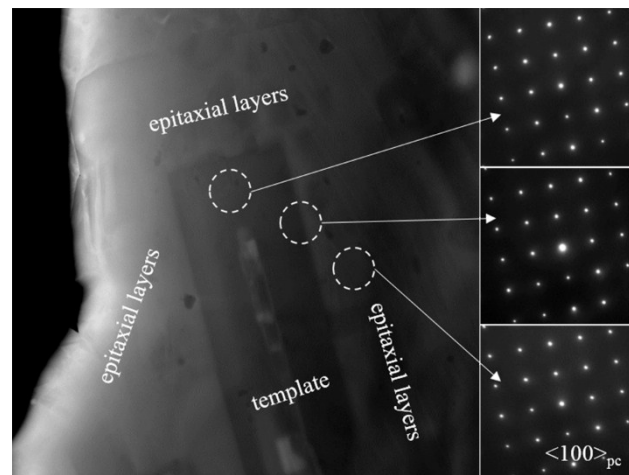


**Fig. S2.** Cross-section SEM-BSE image of textured ceramic sintered at 1100 °C for 3 h. The areas with brighter contrast are liquid phase which surrounds the templates.



**Fig. S3.** EDS spectra of matrix phase and liquid phase in S-1100, liquid phase and Ta-rich phase in S-1140, and residual liquid phase and epitaxial layer in S-1190. The EDS spectra show the composition of liquid phase varies during the sintering process. The liquid phase in S-1100 has more Na than K element and high levels of Ta compared with the matrix phase. The epitaxial layer in S-1190 has a similar composition with the liquid phase in S-1100, but with more Na and Ta elements. The residual liquid phase on the contrary has fewer Na and Ta elements compared to the liquid phase at lower temperatures indicating nearly depletion of these elements during epitaxial growth. The EDS spectrum

of white dots in Fig. 2c shows Ta-rich phases.



**Fig. S4.** STEM-HADDF image of S-1190 sample showing coarsened epitaxial layers. SAED patterns confirm that the epitaxial layer has the same orientation with the template in final textured ceramics.