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## Microstructure and properties of grain oriented $\text{KSr}_2\text{Nb}_5\text{O}_{15}$ electro-ceramics

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Lead-free ferroelectric materials especially niobate crystals and ceramics with tungsten bronze structure (TB) have attracted much more attention in recent years.  $\text{KSr}_2\text{Nb}_5\text{O}_{15}$  (KSN), with a full of TB structure, taking a higher Curie temperature ( $T_c$ ) than  $\text{Sr}_{1-x}\text{Ba}_x\text{Nb}_2\text{O}_6$ , has shown a room-temperature electro-optic effect approximately seven times than that of  $\text{LiNbO}_3$ . Thus KSN can be widely used in thermal sensitive element, electro-optic modulator and surface acoustic filters, etc. However, the piezoelectric and ferroelectric properties of KSN ceramics are not desirable, which has restricted the applications of material. In this work, well-developed 1-Dimensional rod-like KSN particles are fabricated by Molten Salt Synthesis, and textured KSN ceramics with highly grain orientation have been successfully produced by RTGG using the rod-like KSN particles as templates. The microstructure of KSN textured ceramics are analyzed by using XRD, SEM, Neutron Diffraction, Raman Spectra, and Piezo Response Force Microscopy (PFM). The formation mechanism of the oriented grain growth is discussed and the existence of domain structure with different polarization direction is certified by PFM analysis.

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