

THE PULSE CURRENT RELEASE PROPERTIES OF GLASS-ADDED LEAD LANTHANUM ZIRCONATE TITANATE STANNATE ANTIFERROELECTRIC CERAMICS

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In this paper, properties of $\text{Pb}_{0.91}\text{La}_{0.06}[(\text{Zr}_{0.70}\text{Sn}_{0.30})_{0.84}\text{Ti}_{0.16}]\text{O}_3$ (PLZST) with glass added were studied. The glass was added to PLZST in weight percent: 0.2% wt, 0.4% wt, 0.6% wt, 0.8% wt, 1.0% wt and 5.0% wt. All the glass added PLZST samples were fabricated with solid reaction method and can be well sintered under 1250 °C while PLZST sintering temperature is 1300 °C. The hysteresis of glass added PLZST ceramic exhibited amormal in low electric field and the maximum polarization decreased intensively with increasing glass content. The dielectric permittivities versus temperature curves showed more dispersive and the Curie temperature increased with increasing glass content. Pulse current release properties of PLZST showed increasing maximum discharge current and discharge period with increasing electric voltage. Breakdown strength can be raised by adding 1% wt glass in PLZST. The energy storage density decreased with glass addition because of severe decrease in maximum polarization.

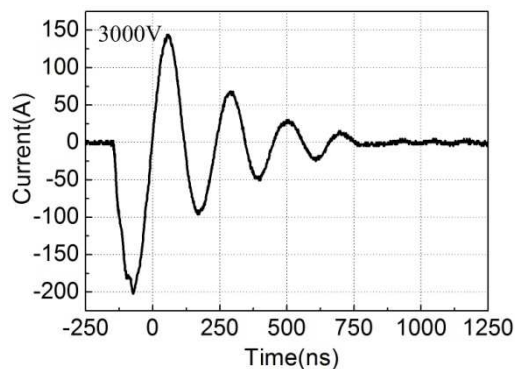


Fig.1. Charge release current of PLZST under 3000V

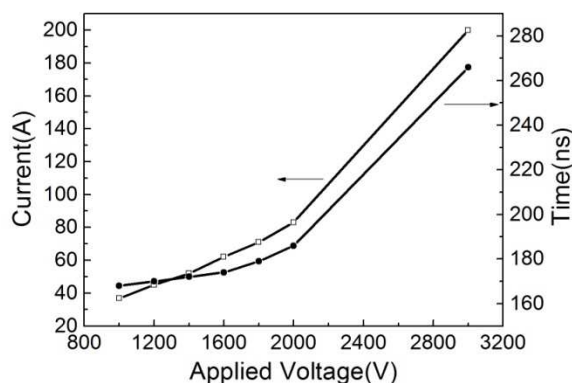


Fig. 2. The maximum current release and period changing of PLZST ceramics under voltage of 1000V to 3000V

REFERENCES

- [1] Smolenskii GA, Bokov VA, Isupov VA, et al. Ferroelectrics and related materials[M]. New York. Gordon and Breach Science Publishers, 1984.
- [2] Ma C, Tan X, Dul'kin E, et al. J. Appl. Phys., 2010, 108: 104105-1-104105-8.
Pennycook SJ, Jesson DE, McGibbon AJ, et al. J. Electron Microsc., 1996, 45: 36-43