

3rd World Congress on Nanotechnology and Advance Materials

November 08-09, 2022 | Webinar

Volume: 13

Superior Piezoelectric, ferroelectric and Energy Storage Efficiency for pseudo-tetragonal phase existent Zn-ions Inserted hybrid SrBi₄Ti₄O₁₅-Based Ceramics

Nawishta Jabeen

PhD, Department of Physics, Fatima Jinnah Women University Rawalpindi, Pakistan

Due to high rising demand and price variations of the natural fuels has compelled the scientists to surge for the alternative ways to produce the sustainable energy resources, for such challenges dielectric ceramic capacitors have been explored for future generation energy materials. Herein this study a hybrid Sr_{0.2}Na_{0.4}Pr_{0.4}Bi₄Ti₄O₁₅:xwt%ZnO (x = 0-0.20) ceramic system has been fabricated to observe the basic insight of the material for such applications via ferroelectric, dielectric and ferroelectric analysis. Ceramic with x = 0.15wt%ZnO has shown the best merits among all the compositions with saturated polarization (PS) of 15.04 $\mu\text{C}/\text{cm}^2$, stored energy density (WST) of 1.5 J/cm³, energy conversion efficiency (η) of 41% and piezoelectric d₃₃ coefficient of 21 pC/N. Moreover the ceramic has also maintained its d₃₃ values for high temperature, even at the temperature of 500 °C, it has retained its d₃₃ of 76% (16 pC/N) of initial value. Such characteristics of the material not only make it ideal candidate for FeRAM devices but also for high temperature piezoelectric applications.

Biography

Dr. Nawishta Jabeen has done her PhD from Nanjing University of Science and Technology, Nanjing City, China. Presently she is working as an Assistant Professor in Department of Physics, Fatima Jinnah Women University Rawalpindi. Her focused area of research are alkaline based supercapacitors, batteries and multifunctional materials for ceramics and thinfilms.

<mailto:nawishta.jabeen@fjwu.edu.pk>