عنوان مقاله:

Studying the Effects of Nano Sintering Additives on Microstructure and Electrical Properties of Potassium-Sodium Niobate Piezoceramics

محل انتشار:

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خلاصه مقاله:

In this paper, lead free (K0.48,Na0.52)NbO3 (KNN(48-52)) piezoelectric ceramics were made by conventional solid state sintering process. Additives of nano ZnO (n-ZnO), nano CuO (n-CuO) and nano SnO2 (n-SnO2) were used in order to decrease the sintering temperature, as well as modifying the dielectric, piezoelectric and ferroelectric properties. Phase structure and microstructure were analyzed using X-ray diffractometry and scanning electron microscopy techniques. The largest piezoelectric constant of d33= 150 pC/N was obtained for KNN (48-52) with 0.6 mol% n-ZnO at sintering temperature of 1070 °C, which is two times larger than that of pure KNN (48-52) at higher sintering temperatures. Additionally, KNN(48-52) ceramics co-doped with 0.8 mol% n-ZnO, 0.5 mol% n-CuO and 0.8 mol% n-SnO2, showed dielectric and piezoelectric properties of d33= 97 pC/N, tanδ = 0.006 and εr = 172 at sintering temperature of 960 ºC, which are much better than corresponding values for pure KNN at 1110 ºC.

کلمات کلیدی:

K0.48Na0.52) NbO3, Nano Sintering Additives, Piezoelectric Properties, Dielectric properties)