Supplementary Information for

Differences in nature of electrical conductions among $Bi_4Ti_3O_{12}$-based ferroelectric polycrystalline ceramics

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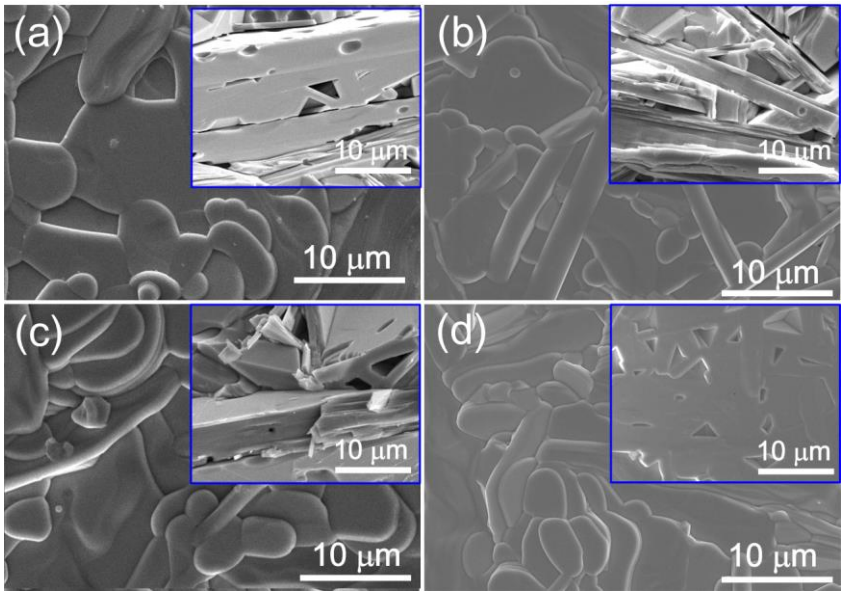

Fig. S1 Surface and cross-section (inset) SEM images of (a) BiT-Bi (b) BiT-La, (c) BiT-Nd, and (d) BiT-Nb ceramics.

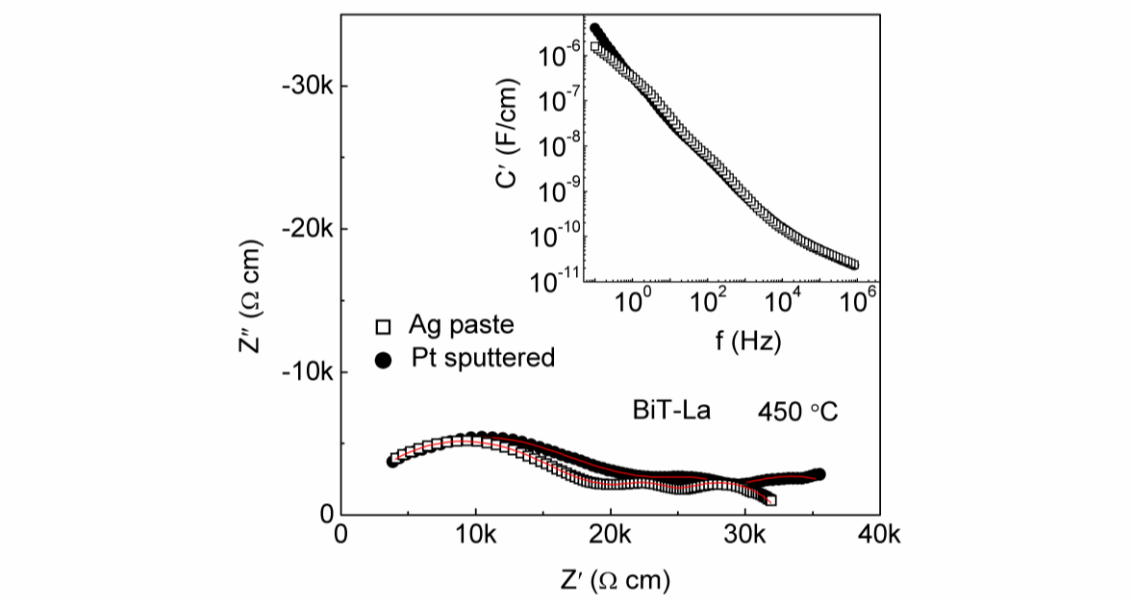

Fig. S2 Complex Z* s and *C′* spectroscopic (inset) plots at 450 ℃ for the air-processed BiT-La sample with different electrodes (Ag paste and sputtered Pt).

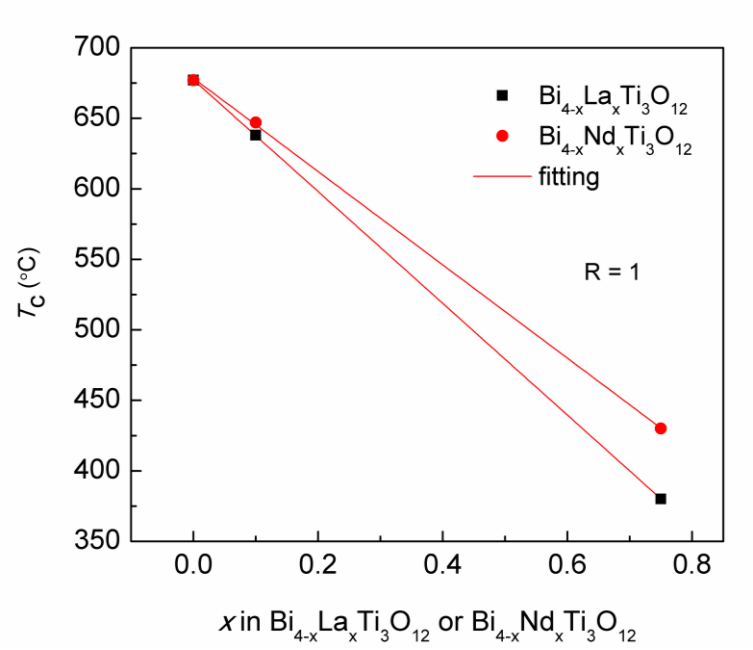

Fig. S3 T_c vs. x in $Bi_{4-x}La_xTi_3O_{12}$ and $Bi_{4-x}Nd_xTi_3O_{12}$

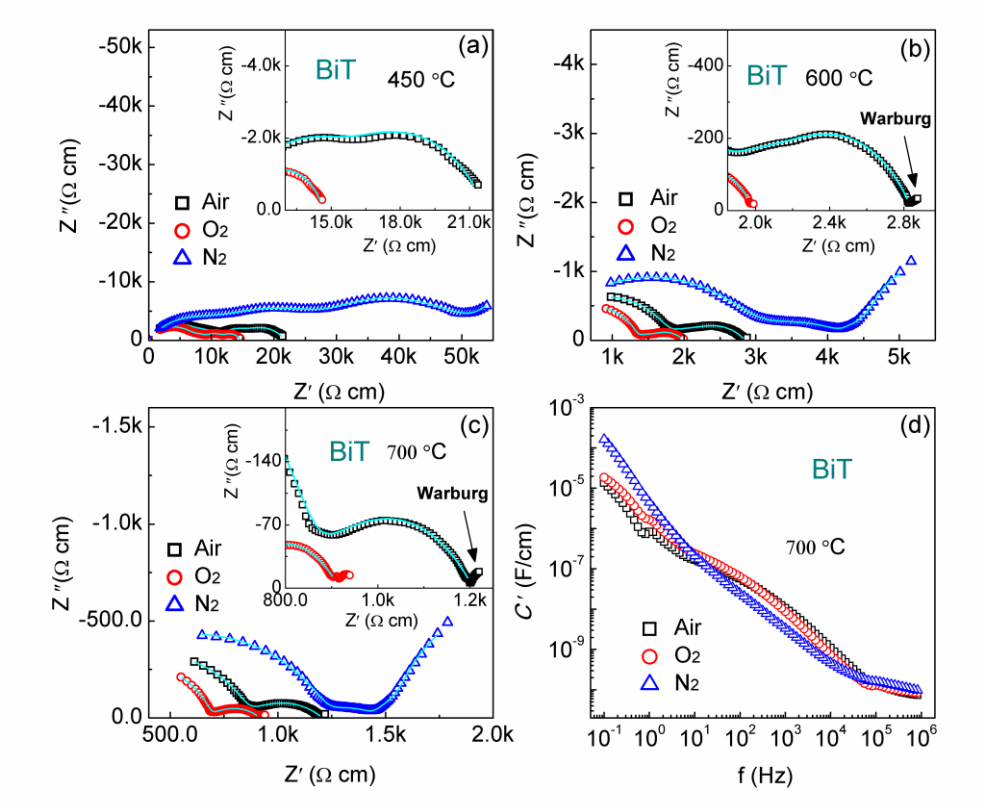

Fig. S4 (a) 450 ℃, (b) 600 ℃ and (c) 700 ℃ Z^* plots of the air-, O_2- and N_2-processed BiT samples, with insets showing the regionally enlarged drawings. (d) 700 °C C' spectroscopic plots of the air-, O_2- and N_2-processed BiT samples.

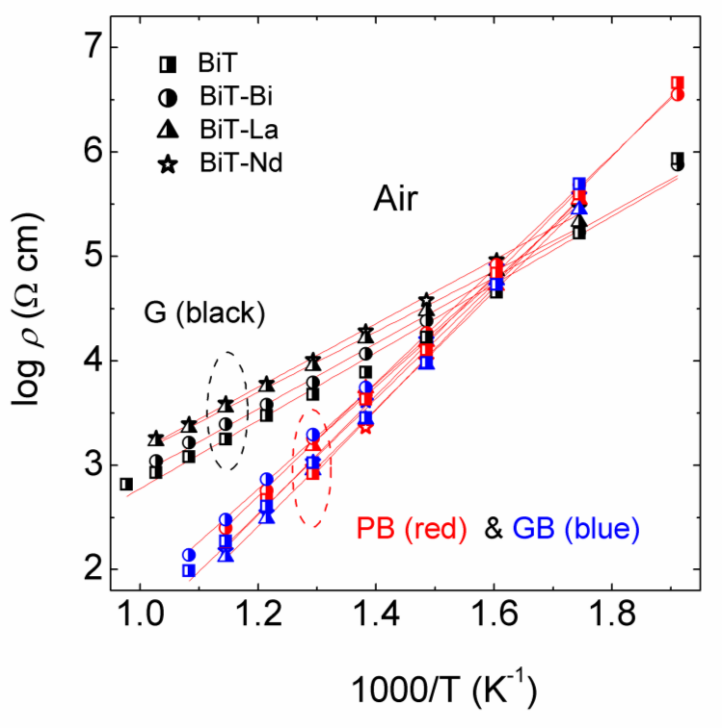

Fig. S5 Bulk, PB and GB resistivity Arrhenius plots for the air- processed BiT and BiT-A samples.