**SUPPLEMENTARY INFORMATION**

**Structural and electrical properties of Zr-doped K0.48Na0.52NbO3 ceramics: “hard” lead-free piezoelectric**

Héctor Beltrán-Mira,\*, Xavier Vendrellb,c, Emerson Luiz dos Santos Veigaa, Lourdes Mestresc, Eloísa Cordoncilloa,\*\*.

a Departamento de Química Inorgánica y Orgánica, Universitat Jaume I, Avda. Sos Baynat s/n, 12071, Castellón, SPAIN.

b Universitat Politècnica de Catalunya. Nanoenginyeria de materials aplicats a l'energia. Campus Besòs - Edifici C - Planta 3, C3.8. Av. Eduard Maristany 10-14, 08930 – Sant Adrià de Besòs, SPAIN.

c Departamento de Química Inorgánica y Orgánica, sección Inorgánica. Facultad de Química. Universitat de Barcelona. C/ Martí i Franquès, 1-11. C.P. 08028, Barcelona, SPAIN

\*mir@uji.es \*\* cordonci@uji.es

*Impedance measurement*



**(a)**



x=0.005 759ºC



**(b)**

x=0.015 765ºC

**Fig. S1**. Impedance complex plane plots, Z\*, for x = 0.005 (a) and x = 0.015 (b) samples at 759 and 765 ºC, respectively.

1.5

1.8

**(b)**  x=0.005 759ºC

1.2

0.9

0.6

0.3

0

0

0.3

0.6

0.9

1.2

1.5

**(a)** x =0 743ºC

2.5

3.0

1.5

1.0

0.5

0

2.0

**(d)**  x=0.03 756ºC

2.0

1.2

0.8

0.4

0

1.6

**(c)**  x=0.015 765ºC

**Fig. S2**. Z”/M” spectroscopic plots for x = 0 (a), x = 0.005 (b), x = 0.015 (c) and x = 0.03 (d) samples at 743, 759, 765 and 756 ºC, respectively.