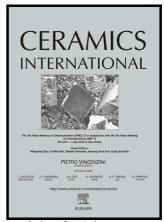
## Author's Accepted Manuscript

Composite microstructures and piezoelectric properties in tantalum substituted lead-free  $K_{0.5}Na_{0.5}Nb_{1-x}Ta_{x}O_{3}$  ceramics

F. Jean, F. Schoenstein, M. Zaghrioui, M. Bah, P. Marchet, J. Bustillo, F. Giovannelli, I. Monot-Laffez



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## ACCEPTED MANUSCRIPT

Composite microstructures and piezoelectric properties in tantalum substituted lead-

free K<sub>0.5</sub>Na<sub>0.5</sub>Nb<sub>1-x</sub>Ta<sub>x</sub>O<sub>3</sub> ceramics.

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**Abstract** 

 $K_{0.5}Na_{0.5}Nb_{1-x}Ta_xO_3$  (KNNT) (with x = 0.00, 0.05, 0.10, 0.20, 0.30, 0.50 and 1) ceramics

are prepared by ball milling and two calcinations at 830 °C for 5 hours. Subsequent

sintering of centimeter size pellets, 1-2 mm thick, is studied using conventional and

spark plasma sintering techniques with various conditions. X-Ray diffraction and

Raman spectroscopy phase identification reveal orthorhombic to tetragonal phase

transitions occurring at about x = 0.50, associated to chemical disorder. Scanning

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