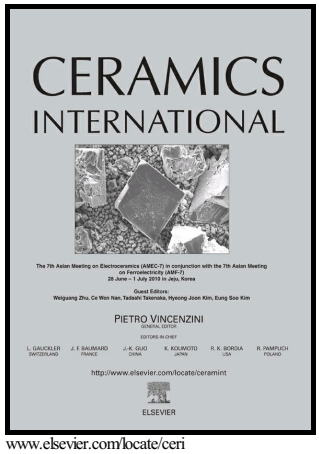

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Abstract:

A series of $Ca_{0.61}Nd_{0.26}Ti_{1-x}(Cr_{0.5}Nb_{0.5})_xO_3$ (CNTCN*x*) ($0 \le x \le 0.1$) ceramics were prepared via a solid state reaction method. All CNTCN*x* samples were crystallized into the orthorhombic perovskite structure. The SEM micrographs indicated that the average grain sizes of samples depended on $(Cr_{0.5}Nb_{0.5})^{4+}$ concentration. And as $(Cr_{0.5}Nb_{0.5})^{4+}$ concentration increased, the average grain size of samples decreased significantly. The short range order (SRO) structure and structural distortion of oxygen octahedra proved to exist in CNTCN*x* crystals from Raman spectra analysis results. The microwave dielectric properties highly depended on the B-site bond strength, oxygen octahedra distortion, reduction of Ti^{4+} to Ti^{3+} and internal strain η. At last, the CNTCN0.06 ceramic sintered at 1400 ºC for 4h exhibited good and stable comprehensive microwave dielectric properties of ε_r =92.3, $Q \times f$ = 13,889 GHz, τ_f = +152.8 ppm/ºC.

Key words: Microwave dielectric ceramics, Substitution, Crystal structure