

ภาคผนวก จ



# AMEC-5

Asian Meeting on Electroceramics

Exhibitors: the Properties of Surface Defectless Niobate  
Ceramics

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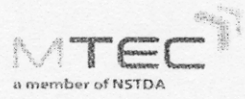
# Abstract Book

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## Effects of $K_2CO_3$ and $Na_2CO_3$ Excess on the Properties of Sodium Potassium Niobate Ceramics

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Nowadays, lead-free materials have been urgently demanded from the viewpoint of environmental protection. One of the promising candidates to replace the lead containing materials is sodium potassium niobate.  $(Na_xK_{1-x})NbO_3$  is a combination of ferroelectric  $KNbO_3$  and antiferroelectric  $NaNbO_3$ , and forms a morphotropic phase boundary (MPB) in composition K/Na around 50/50 ( $x = 0.5$ ). In this research,  $(Na_{0.5}K_{0.5})NbO_3$ , NKN, ceramics with excess of carbonate starting powders (0, 0.01, 0.03 and 0.05 mol) were prepared by solid – state reaction. The results showed that the  $K_2CO_3$  and  $Na_2CO_3$  excess affected significantly to sintering temperature, bulk density, microstructure and dielectric property. Whereas, the XRD result showed that there was no secondary phase formed in all samples. The grain size of excess - samples was smaller than an unexcess - NKN sample. The highest dielectric constant value was found to be 1707 for sample with excess 0.01 mol.

**Keywords:** Powders: solid\_state reaction, Dielectric properties, Niobates, Microstructure-final.