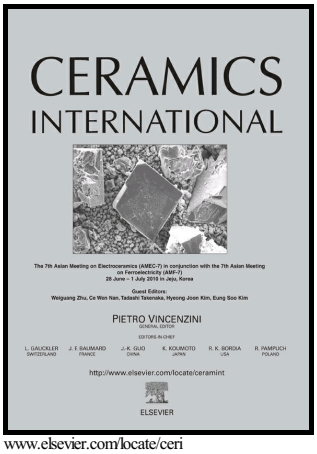


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## Abstract

$KCa_2NaNb_4O_{13}$ (4KCNNO)[1] ceramics are well-sintered at 1325°C without any secondary phase. However, $K_2O$ evaporation occurs in $KCa_2Na_2Nb_5O_{16}$ (5KCNNO)[2] ceramics calcined at temperatures higher than 1200°C, resulting in the formation of the $KCa_2Na_3Nb_6O_{19}$ (6KCNNO)[3] secondary phase. Excess-$K_2O$ was added to the 5KCNNO specimen to synthesize pure 5KCNNO ceramics by compensating for the

[1] $KCa_2NaNb_4O_{13}$ defined as 4KCNNO

[2] $KCa_2Na_2Nb_5O_{16}$ defined as 5KCNNO

[3] $KCa_2Na_3Nb_6O_{19}$ defined as 6KCNNO