

Accepted Manuscript

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PII: S0167-577X(17)30962-X

DOI: <http://dx.doi.org/10.1016/j.matlet.2017.06.070>

Reference: MLBLUE 22782

To appear in: *Materials Letters*

Received Date: 27 April 2017

Revised Date: 6 June 2017

Accepted Date: 14 June 2017



Please cite this article as: M. Promsawat, Z-G. Ye, A. Watcharapasorn, Enhancement of piezoelectric properties of $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})_{0.65}\text{Ti}_{0.35}\text{O}_3$ ceramics by ZnO modification, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.06.070>

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Enhancement of piezoelectric properties of $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})_{0.65}\text{Ti}_{0.35}\text{O}_3$ ceramics by ZnO modification

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Abstract

The effects of ZnO modification on the microstructure and piezoelectric properties of $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})_{0.65}\text{Ti}_{0.35}\text{O}_3$ (PMNT) ceramics were investigated. The grain size tended to increase with increasing ZnO content. Secondary phases were observed in the ceramics with 4.0 and 11.0 mol%ZnO. The piezoelectric properties of the PMNT ceramics were enhanced by introduction of 0.4-4.0 mol%ZnO. The piezoelectric properties deteriorated when higher ZnO contents were used. Among all the investigated compositions, the highest piezoelectric performance was observed for the PMNT/0.4mol%ZnO ceramic. This makes the PMNT/0.4mol%ZnO ceramic promising for piezoelectric applications.

Keywords: Ferroelectrics; Piezoelectric materials; PMNT; Electrical induced-strain; Energy harvester

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