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Relative stability of ferroelectric and antiferroelectric states in $(Na_{0,5}Bi_{0,5})TiO_3$-based solid solutions V. SOBOLEV, South Dakota School of Mines Technology, Rapid City, SD 57701, USA, V. M. ISHCHUK, L. G. GUSAKOVA, N. G. KISEL, D. V. KUZENKO, N. A. SPIRIDONOV, Science Technology Center Reactivelectron of the National Academy of Sciences of Ukraine, 83049 Donetsk, Ukraine — Influence of the B-site ion substitutions on the of relative stability of the antiferroelectric and ferroelectric phases in $[(Na_{0.5}Bi_{0.5})_{0.80}B_{0.20}](Ti_{1-x}B_x)O_3$ (NBT-BT) solid solutions has been investigated. Zirconium and tin ions along with $(In_{0.5}Nb_{0.5})$, $(Fe_{0.5}Nb_{0.5})$, and $(Al_{0.5}V_{0.5})$ ion complexes have been used for substitutions. It is found that an increase of content of the substituting ion results in a near linear variation in the size of the crystal lattice unit cell. The relative stability of the antiferroelectric and ferroelectric phases changes according to the variation of the tolerance factor of solid solution which in turn varies with the change of solid solution composition cause by substitutions. Obtained results demonstrate a predominant influence of the size of substituting ions on the relative stability of the antiferroelectric and ferroelectric states in $(Na_{0.5}Bi_{0.5})TiO_3$-based solid solutions. Our results open a new option for raising the temperature of the ferroelectric to antiferroelectric phase transition NBT-BT compounds.

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