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Relative Stability of FE and AFE States in $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$ -based Solid Solutions V.L. 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 Nat. Acad. of Sci. of Ukraine, 83049 Donetsk, Ukraine — Changes of the relative stability of antiferroelectric (AFE) and ferroelectric (FE) phases in the $[(\text{Na}_{0.5}\text{Bi}_{0.5})_{0.80}\text{Ba}_{0.20}](\text{Ti}_{1-y}\text{B}_y)\text{O}_3$ system of solid solutions with the *B*-site ion substitutions have been studied. Ions of zirconium and tin along some ions complexes such as (InNb), (FeNb) and several others were used for substitutions. The increase in the substituent ion content leads to nearly linear variation of the crystal cell size along with changes of the relative stability of the AFE and FE phases according to the tolerance factor variation. Substituent ions with ionic radii larger than the ionic radius of original ion evoke a decrease of the FE-AFE phase transition temperature. The substituent ions with smaller ionic radii have the opposite effect. Our results demonstrate that the size of the substituent ion causes a predominant influence on the relative stability of the FE and AFE states in $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$ -based solid solutions. Our studies also indicate the way to raise the FE-AFE phase transition temperature.

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