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Influence of Phase Coexistence on Crystal Structure of 6%-La Series of Plzt Solid Solutions V.M. ISHCHUK, V.N. BAUMER, Institute for Single Crystals of the Academy of Sciences of Ukraine, Kharkov, Ukraine, Z.A. SAMOYILENKOLENKO, Physics & Technology Institute of the Academy of Sciences of Ukraine, Donetsk, Ukraine, V.L. SOBOLEV, South Dakota School of Mines & Technology, Rapid City, SD — La modified lead titanate zirconate (PLZT) solid solutions with 6 percent of La are characterized by a wide interval of Ti concentrations (from y = 0.16 to about y = 0.3) in which coexistence of ferroelectric (FE) and antiferroelectric (AFE) states is possible. Presence of coexisting domains of FE and AFE phases influences the crystal structure of these compounds noticeably. Detailed studies of position and shape of the (200) and (222) X-ray diffraction lines, which are the most characteristic lines for cubic perovskites, were carried out for solid solutions within and outside the above mentioned interval of Ti concentrations. It is demonstrated that the crystal structure of solid solutions in this interval of Ti content is non-cubic at the temperatures below the Curie temperature. The complex structure of the (200) and (222) diffraction lines is caused by the simultaneous presence of domains of coexisting FE and AFE phases. The shape of the X-ray lines undergoes modifications with the change of Ti content in solid solution and returns to the standard shape when the compositions of the solid solution correspond to both pure FE (rhombohedral) and pure AFE (tetragonal) phases.

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