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Behavior of $(Pb_{0.9}Ba_{0.05}Sr_{0.05})(Zr_{1-x}Ti_x)O_3$ solid solutions in the vicinity of morphotropic boundary V. SOBOLEV, Physics Department, South Dakota School of Mines and Technology, Rapid City, SD 57701, V. ISHCHUK, Institute for Single Crystals of National Academy of Sciences of Ukraine, Kharkov, 61001, Ukraine, V. BAUMER, Institute for Single Crystals of National Academy of Sciences of Ukraine, Kharkov, 61001, Ukraine, T. TEPLITSKAYA, Institute for Single Crystals of National Academy of Sciences of Ukraine, Kharkov, 61001, Ukraine — $(Pb_{0.9}Ba_{0.05}Sr_{0.05})(Zr_{1-x}Ti_x)O_3$ series of solid solutions possess rather narrow width of the morphotropic region that does not exceed 5% (determined by X-ray diffraction studies). Using a modified ceramic technique, we obtained samples with a grain size of the order of 20-25 μm. We performed detailed investigations of piezoelectric and dielectric properties of these samples. It is shown that the temperature interval of the diffuse phase transition depends on the position of the given solid solution in the "Ti concentration – Temperature" phase diagram. The maximum interval is observed in the middle of the morphotropic region. There exists a temperature interval of the order of several decades of degrees above the Curie point where piezoelectric resonance can be observed. The width of this temperature interval reduces considerably when solid solution composition moves from morphotropic region.

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