SYMMETRY ANALYSIS OF INDUCED PYROACTIVITY IN RADIALLY INHOMOGENEOUS TEMPERATURE FIELDS

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S u m m a r y

For the first time, a symmetry approach to studying the induced pyroactivity in acentric crystals under thermodynamically nonequilibrium conditions is advanced. Symmetry analysis of the properties of polar states is performed, and all possible types of pyroactive crystallographic cuts are determined in each of twenty piezoelectric classes in radially inhomogeneous temperature fields. It is shown that the tertiary pyroelectric effect can manifest itself in both polar and nonpolar crystallographic cuts. In the general case, the induced polarization vector is not coincident with the sole polar direction which is contained in the group describing a crystal symmetry in the external field. The results of the symmetry analysis agree with the experimental data which have been first explained on its basis. The elaborated symmetry approach turns out to be an efficient method for revealing the peculiar properties of a spatial polarization distribution. This information is required for developing the physical foundations of a new class of sensor devices operating on the basis of the induced pyroactivity in acentric crystals.