

Structural transformations and magnetic changes in multiferroic BiFeO₃ under external electric field

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In this study we investigate an influence of the electric field on structure parameters and magnetic state in multiferroic BiFeO₃. Our theoretical model is based on the Landau theory of phase transitions, which takes into account a contribution of electric polarization, rotation angle of oxygen octahedra in a crystal of cubic symmetry, and a contribution of magnetic subsystem. We define the coefficients in the invariant expansion of the thermodynamic potential by the comparison of the predicted critical field of phase transitions with the results of Ref [1, 2]. Calculations are made of structural distortions in the crystal caused by the external electric field and the concomitant rearrangement of the magnetic structure in a homogeneous state and in a state with spatially modulated spin structure. This work is supported by the Russian Foundation for Basic Research, project 13-07-12405 ofi_m2.

References:

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