

'Single Crystal Ball' Model and Properties of Functional Ceramics

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Abstract

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abstract : The work of the paper intends to study related mechanisms of the functional properties in functional electronic Ceramics proceeding from the study of Ceramic dielectric characteristics. A 'Single Crystal ball' model was proposed according to the 'Lorentz ball' which used in dielectric physics. We regarded ceramics as a composite with separated 'Single Crystal ball' and continuous honey comb-like grain boundary. That is to say that ceramics was regarded as a 'Supersaturated Solution' composed by grain-boundary 'Solvent' and Single crystal 'solute'. Use the methods of dielectric physics; structure chemistry; defect chemistry and chemical dynamics to study the electric-physical properties of the grains, grain - boundaries and ceramics as a whole . Then , analyze and explain the PTCR effect in PTC ceramics at first ,and proceed to study the application possibility of the model to the functional properties of other functional electronic ceramics. Keywords: Functional ceramics; 'Single Crystal Ball'; Supersaturated solution; PTC Ceramics