

Effect of Diamagnetic Additives on Defects Level of Soft LiTiZn Ferrite Ceramics

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Abstract : The article presents the results of the influence of diamagnetic additives on the defects level of ferrite ceramics. For this purpose, we use a previously developed method based on the mathematical analysis of experimental temperature dependences of the initial permeability. A phenomenological expression for the description of such dependence was suggested and an interpretation of its main parameters was given. It was shown, that the main criterion of the integral defects level of ferrite ceramics is the relation of two parameters correlating with elastic stress value in a material. Model samples containing a controlled number of intergranular phase inclusions served to prove the validity of the proposed method, as well as to assess its sensitivity in comparison with the traditional XRD (X-ray diffraction) analysis. The broadening data of diffraction reflexes of model samples have served for such comparison. The defects level data obtained by the proposed method are in good agreement with the X-ray data. The method showed high sensitivity. Therefore, the legitimacy of the selection relationship β/α parameters of phenomenological expression as a characteristic of the elastic state of the ferrite ceramics confirmed. In addition, the obtained data can be used in the detection of non-magnetic phases and testing the optimal sintering production technology of soft magnetic ferrites.

Keywords : cure point, initial permeability, integral defects level, homogeneity

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