

**PIEZOELECTRIC RESPONSE OF POROUS CERAMIC AND COMPOSITE MATERIALS
BASED ON Pb(Zr,Ti)O₃: EXPERIMENT AND MODELLING**

C. R. Bowen*, V. Yu. Topolov, and S. V. Glushanin****

* Department of Engineering and Applied Science, University of Bath, Bath, UK, BA2 7AY

** Department of Physics, Rostov State University, Zorge st. 5, 344090 Rostov-on-Don, Russia

Abstract

This paper presents experimental and theoretical studies of the effective piezoelectric properties of porous Pb(Zr,Ti)O₃-based ceramics and composites. Experimental dependences of piezoelectric coefficients, dielectric permittivity and figures of merit on relative density are determined for porous materials containing different piezopassive components. The features of the piezoelectric response of these materials in a wide range of volume concentration of the piezopassive components are analysed in the framework of a model of a modified laminated composite with 2-2 and 1-3 connectivity elements. The role of these elements in forming different concentration dependences of the effective parameters of the porous piezoceramic and piezocomposite materials is discussed.