

Szeremeta Anna, Molak Andrzej. **Properties of piezoelectric PZT-BMO ceramics.** Institute of Physics, University of Silesia, Katowice, Poland.

The study was conducted on PZT doped with BiMnO₃. This ceramics belongs to the ferroelectrics group of perovskite structure. This material can be applied in medical apparatus, e.g. the piezoelectrics PZT is used in ultrasound sensors. Their purpose is to convert electrical energy into mechanical and vice versa. Study was conducted to determine how the PZT-BiMnO₃ solid solution changes its properties when the piezoelectric PZT is combined with a non-polar BiMnO₃ material. The improvement of the piezoelectric features are demanded in aim to develop the ultrasound imaging.

The study was performed using the electric spectroscopy in the frequency range 50 Hz – 1 MHz. Results were analyzed with use of following representations:

- real $\epsilon'(T,f)$ and imaginary $\epsilon''(T,f)$ part the electric permittivity
- imaginary part of electric modulus $M''(T,f)$
- dielectric loss coefficient $\tan \delta = \epsilon''/\epsilon'$

The addition of BiMnO₃ induced the relaxor features since the Fogel-Fulcher law was fitted. The PZT-BMO shown semiconductor features and the estimated value of the activation energy was 0.33 for 10 % BiMnO₃ and 0.36 – 0.51 eV for 20% BiMnO₃. The piezoelectric features were not improved.