



Instytut Fizyki
Wydział Matematyczno-Fizyczno-Techniczny
Uniwersytet Pedagogiczny im. Komisji Edukacji Narodowej w Krakowie



Serdecznie zapraszamy na
SEMINARIUM IF-UP

referat pt.

“New Multiferroics Searching by Cobalt Doping into Barium Titanate”

Wygłosi

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(IF-UP)

Seminarium odbędzie się w piątek, **25 maja 2018, o godz. 12:00**
w sali 514, główny budynek UP, ul. Podchorążych 2, 30-084 Kraków.

Zapraszamy!

Streszczenie:

The crystal structure modifications of BaTiO_3 induced by cobalt doping were studied. The polycrystalline $(1-x)\text{BaTiO}_3 + x\text{Co}_2\text{O}_3$ samples, with $x \leq 10$ wt.%, were prepared by high temperature sintering conventional method. According to X-ray phase and structural characterization, performed by full-profile Rietveld refinement technique, all synthesized samples showed tetragonal symmetry perovskite structure with minor amount, of parasitic phases. Pure single-phase composition has been detected only in the low level of doping BaTiO_3 . It was indicated that substitution of Co for the Ti sites in the $(1-x)\text{BaTiO}_3 + x\text{Co}_2\text{O}_3$ series led to decrease of tetragonality (c/a) of the BaTiO_3 perovskite structure. This effect almost vanished in the $(1-x)\text{BaTiO}_3 + x\text{Co}_2\text{O}_3$ samples with nominal Co content higher than 1 wt.%, in which precipitation of parasitic Co-containing phases CoO and Co_2TiO_4 has been observed. Based on the results, the solubility limit of Co in Ti sub-lattice in the $(1-x)\text{BaTiO}_3 + x\text{Co}_2\text{O}_3$ series is estimated as x about 0.75 wt.%. The cobalt doping into BaTiO_3 caused the increasing of the dielectric permittivity ϵ_{max} values about two times in comparison with the analogical one for pure BaTiO_3 and a little lowered Curie temperature. Results from the newest complementary investigations of physical properties of studied samples will be presented and discussed.

References: Phase Transitions, 2017; 90(1): 78–85; Ceramics International, 2015; 41(3): 3983-3991; Journal of Electroceramics, 2014; 32: 92–101.