

Synthesis of thermoelectric $\text{Ca}_2\text{Co}_2\text{O}_5$ nanocrystalline powder – structural and selected physical studies

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Recently the growing interest in the development of new renewable energy sources is observed. Large expectations are put, among others, on thermoelectric materials, as potential source of renewable energy. This is largely related with development of methods and techniques of manufacturing nanocrystalline structures observed nowadays. This development was found to be very beneficial for thermoelectric materials properties.

Oxide materials have large potential for applications in thermoelectricity, especially when high temperatures are concerned. They have a lot of advantages among heavy metallic alloys: they are environmentally friendly, non-toxic, their natural resources are high. The aim of this work is to compare two different methods of obtaining thermoelectric $\text{Ca}_2\text{Co}_2\text{O}_5$ nanocrystalline powders and analyze their structural, morphological and electrical parameters.

$\text{Ca}_2\text{Co}_2\text{O}_5$ single-phase materials were obtained using: a) solid state synthesis – mechanosynthesis („*top down*”) and b) modified sol-gel method („*bottom up*”). During the Conference we will present the effects of our experiments, impact of these two different methods on the structural parameters using XRD analysis (crystallite sizes, lattice parameters and volume cells), morphologies by SEM (size and distribution of grains), and electrical properties.