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Book of Abstracts

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16:00-16:30	Dr. Saloua MERAZGA (**O1**) **Properties of Mg2-x Alx Ni(x = 0, 0.1, 0.2, 0.3) alloys prepared by mechanical alloying for electrochemical hydrogen storage** *Research Center Semiconductor Technology for Energetic, Algiers, Algeria*	***Keynote talk*** Dr. Oleksandr Tkach (**I6**) **Aliovalent Doping Engineering in SrTiO3-based Electroceramics** *Department of Materials and Ceramic Engineering, CICECO – Aveiro Institute of Materials, University of Aveiro, Aveiro, 3810-193, Portugal*
16:30-17:00	***Keynote talk*** Dr. D. Pukazhselvan (**I28**) **Catalyzed magnesium hydride for clean energy storage applications** *TEMA, Department of Mechanical Engineering, University of Aveiro, Portugal*	Diogo Lopes (**O36**) **Oxide thermoelectrics prepared by laser melting: effects of processing atmosphere** *CICECO - Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193 Aveiro, Portugal*
17:00-17:30	Allan J. M. Araújo (**O40**) **Proteic sol-gel synthesis of Gd-doped ceria electrolytes** *Materials Science and Engineering Postgraduate Program, UFRN, 59078-970, Natal, Brazil*	Dr. Mónica Silva (**O28**) **Cellulose acetate/Iron oxide nanocomposite films: synthesis, characterization and RB5 removal** *2C2T-Centre for Textile Science and Technology, University of Minho, Campus de Azurém, 4800-058, Guimarães, Portugal*
18:00-18:30	Francisco J. A. Loureiro (**O38**) **ZnO-modified BZY upon different B-site locations** *Centre for Mechanical Technology and Automation, Mechanical Engineering Department, University of Aveiro, Aveiro, 3810-193, Portugal*	Dr. Gabriel Constantinescu (**O37**) **Electrical performance tuning in thermoelectric Ca3Co4O9 materials by transition metals additions** *CICECO – Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, 3810-193, Aveiro, Portugal*
18:30-19:00	**Conference Closing Ceremony**	

O37. Electrical performance tuning in thermoelectric $Ca_3Co_4O_9$ materials by transition metals additions

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This work reports on the effects on high-temperature thermoelectric (TE) properties in bulk, polycrystalline p-type $Ca_3Co_4O_9$ ceramics, after employing a composite approach consisting of metallic particles additions and two simple sintering schemes. The added Fe, Co and Ni particles are expected to act as porosity fillers upon oxidation in air and provide improved grain connectivity, changing the microstructural features and electrical properties of the resulted materials. The composites have been prepared through a modified Pechini method, followed by one- and two-stage sintering, to produce low-density (one-stage, 1ST) and high-density (two-stage, 2ST) ceramic samples. The electrical conductivity (σ), Seebeck coeffcient (α) and power factor (PF) values have been investigated between 475 and 975 K, in air flow, and related to the sample's respective phase compositions, morphologies and microstructures. For the Co additions in the 1ST sintering case, the porous samples reached maximum PF values of around 210 $\mu Wm^{-1}K^{-2}$, being around two times higher than those of the pure $Ca_3Co_4O_9$ matrix. For the 1ST-sintered Fe and Ni added samples, the highest PF values of 80 and 90 $\mu Wm^{-1}K^{-2}$ have been measured for the 3% vol. Ni and 3 and 6% vol. Fe additions, respectively, very close to some of the best reported values from literature. In contrast, 2ST sintering resulted in much denser samples and more complex phase compositions and microstructures, leading to lower electrical performance. The improvements of electrical properties achieved in the present work are promoted by a simultaneous increase in electrical conductivity and Seebeck coefficient values, stemming from pore filling effects and subsequent microstructural modifications.