

International conference

Functional Inorganic Materials



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Abstract book



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International Conference
Functional Inorganic Materials 2022

12:30–14:00 Lunch break			
Oral session (Chairperson Prof. Dr. Rasa Pauliukaitė)			
14:00–14:30	Invited Speaker Prof. Dr. Rimantas Ramanauskas	Center for Physical Sciences and Technology, <i>Lithuania</i>	Corrosion Behaviour of Cerium Based Conversion Coatings on Zinc
14:30–15:00	Invited Speakers Habil. Dr. Anna Lukowiak	Polish Academy of Sciences, <i>Poland</i>	Bioactive Glasses with Luminescent Properties
15:00–15:30	Invited Speaker Prof. Dr. Tomas Tamulevičius	Kaunas University of Technology, <i>Lithuania</i>	Nanomaterials and their Structures for Optical Applications
15:30–16:00	Invited Speaker Prof. Habil. Dr. Gerd Meyer	KTH Royal Institute of Technology, <i>Sweden</i>	Small Cause — Great Effect: What the $4f^{n+1}5d^0 \rightarrow 4f^n5d^1$ Configuration Crossover Does to the Chemistry of Divalent Rare-Earth Halides and Coordination Compounds, and How it Makes the Formation of Cluster Complex Compounds and Polar Intermetallics Possible
16:00–17:30 Tour of Vilnius University			

8th of October

Vilnius University seminar room 239, Universiteto St. 3 (live or online).

Time	Presenter	Institution	Title of the Lecture
8:30–9:00	Participant registration		
Oral session (Chairperson Prof. Dr. Aleksej Žarkov)			
9:00–09:30	Invited Speaker Assoc. Prof. Dr. Linus Vilčiauskas	Center for Physical Sciences and Technology, <i>Lithuania</i>	From Fundamental Understanding to Applications in Energy Storage of Phosphate Framework Materials
9:30–9:40	Agnė Kizalaitė	Vilnius University, <i>Lithuania</i>	Novel Whitlockite Compounds: Structure and Properties
9:40–9:50	Dovydas Karoblis	Vilnius University, <i>Lithuania</i>	Investigation of Various Types Ferrites and Manganites Prepared via Sol-Gel Synthetic Approach
9:50–10:00	Anastasija Afonina	Vilnius University, <i>Lithuania</i>	Investigation of Phase Transformations in the Low

Novel Whitlockite Compounds: Structure and Properties

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One of the major minerals in human body is magnesium whitlockite ($\text{Ca}_{18}\text{Mg}_2\text{H}_2(\text{PO}_4)_{14}$). This compound constitutes to approximately 20-35 wt% of human bone tissue and plays an important role in various bone formation processes [1]. Magnesium whitlockite is known for its excellent osteogenic capability as well as having an active role in natural bone healing processes, therefore it is a promising candidate for application in bone regenerative medicine and tissue engineering [2]. In recent years this compound has attracted a lot of attention and the scientific community is looking for methods to improve its' biological properties. One of the potential ways to achieve this goal is to introduce other bioactive ions instead of magnesium into the structure of the material.

In the present work, we present a simple way to reliably synthesize pure-phase whitlockite compounds substituted with different metal ions. Pure-phase whitlockite compounds containing Zn, Cu and Mn ions were successfully synthesized by dissolution-precipitation process. The effect of various synthesis conditions on particle size and morphology was investigated.

Synthesized compounds were analyzed by X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM) and Raman spectroscopy. Rietveld analysis was employed to calculate the structural parameters of the materials.

Acknowledgments

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References

1. H. Cheng et al. *Acta Biomater.* 69 (2018), 342-351.
2. H. L. Jang et al. *Adv. Healthc. Mater.* 5 (2015), 128-136.