

International conference

Functional Inorganic Materials



FIM 2022

Abstract book



VILNIUS UNIVERSITY PRESS



Vilnius
University



CENTER
FOR PHYSICAL SCIENCES
AND TECHNOLOGY



kaunas
university of
technology



Lithuanian
Chemical
Society



12:10–12:20	Rūta Raišeliene	Vilnius University, <i>Lithuania</i>	Synthesis and Investigation of Magnesium Whitlockite Granules
12:20–12:30	Justinas Januškevičius	Vilnius University, <i>Lithuania</i>	Aqueous Sol-Gel Synthesis of Select Orthoferrite Powders, Coatings, Nanotubes
12:30–12:40	Lukas Šerpytis	Vilnius University, <i>Lithuania</i>	Continuous Flow Synthesis of Silicon Dioxide Microparticles
12:40–12:50	Greta Merkininkaitė	Vilnius University, <i>Lithuania</i>	Additive Manufacturing of Inorganic 3D Nanostructures by Combining Laser Lithography and Pyrolysis
12:50–13:00	Davit Tediashvili	Vilnius University, <i>Lithuania</i>	Degradation Study of Vanadium-Based Materials for Aqueous Na-Ion Battery Cathodes
13:00–13:10	Diana Griesiūtė	Vilnius University, <i>Lithuania</i>	Synthesis and Optical Properties of Mn-Doped Calcium Pyrophosphate Polymorphs
13:10–13:40	Conference result review. Scientific discussions. Closing of the conference.		

POSTER SESSION 6 th of October, 16:20–17:30		
P1	Dr. Rasa Alaburdaitė	UV Investigation of CdS Layers on Polypropylene Film
P2	Darija Astrauskytė	Deposition of Optical Coatings on Micro-Optics
P3	Darius Budrevičius	The Optimal Eu Concentration for Luminesces Properties of GdPO ₄
P4	Narvydas Dėnas	Enzyme and Prussian Blue Based Detection of Mercury Ions
P5	Marius Dzvinka	Study of Properties of Europium-Doped Sodium Aluminum Germanate
P6	Neringa Gailiūtė	Synthesis and Analysis of Mg ₂ /Al ₁ -CO ₃ and Zn ₂ /Al ₁ -CO ₃ Layered Double Hydroxide Modified Wood
P7	Dr. Yuriy Gerasymchuk	Structure and Morphology of Thin Layers of Bismuth Ferrite Obtained by the Sol-Gel Method Depending on Different Substrates
P8	Erlandas Kabašinskas	Phase Transformations of Amorphous Calcium Phosphate in Molten Salts
P9	Prof. Habil. Dr. Aivaras Kareiva	Novel Co-Substituted Yttrium Gallium Garnets
P10	Gabija Kavaliauskaitė	Prussian Blue in Formation of Bio-Electrochemical Systems

Synthesis and Investigation of Magnesium Whitlockite Granules

R. Raiseliene*, G. Linkaite, I. Grigoraviciute, A. Kareiva

Faculty of Chemistry and Geosciences, Vilnius University, Naugarduko 24, LT-03225 Vilnius, Lithuania

**Corresponding author, e-mail: ruta.raiseliene@chgf.vu.lt*

Calcium phosphates (CaPs) are the most promising synthetic substitutive biomaterials [1, 2]. However, these biocompounds have some limitations for clinical application as they show low mechanical strength, uncontrolled biodegradation and bioinertness [3].

Magnesium whitlockite (WH, $\text{Ca}_{18}\text{Mg}_2(\text{HPO}_4)_2(\text{PO}_4)_{12}$) is known as the second most abundant mineral in living bone, filling 25-35 wt% of the hard tissue of human bone [4]. As the highlight of WH properties is its better mechanical properties, faster resorbability, and promotional behavior on osteogenesis [4, 5].

In our study, we used a dissolution – precipitation synthesis to fabricate WH granules. Fig. 1 represents scanning electron microscopy (SEM) images of the product.

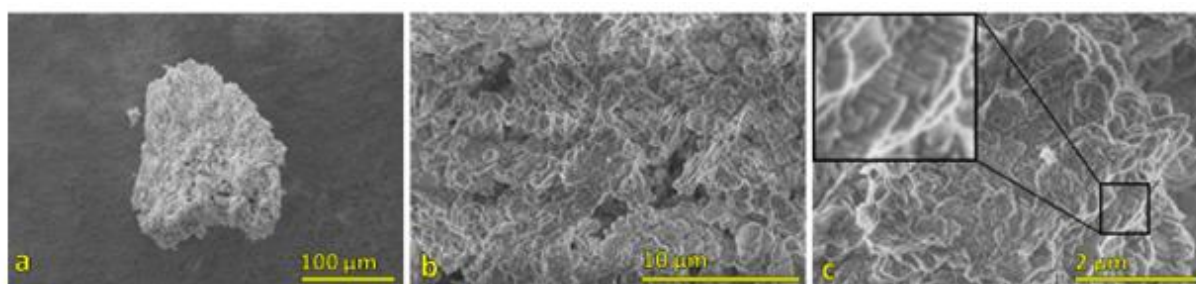


Fig. 1. SEM images of the synthesis product at the different enlargements.

The synthesized samples were also characterized to determine the phase purity and functional groups.

References

1. J. Lu, H. Yu, C. Chen, RSC Adv., **8** (2018) 2015-2033.
2. P. Wang, L. Zhao, J. Liu, M. D Weir, X. Zhou, H. H K Xu, Bone Res., **2** (2014) 14017.
3. S. Batool, U. Liaqat, B. Babar, Z. Hussain, J. Kor. Cer. Soc., **58** (2021) 530-547.
4. C. Wang, K. J. Jeong, H. J. Park, M. Lee, S. C. Ryu, D. Y. Hwang, K. H. Nam, I. H. Han, J. Lee, J. Coll. and Int. Sc., **569** (2020) 1-11.
5. W. B. Lee, C. Wang, J. H. Lee, K. J. Jeong, Y. S. Jang, J. Y. Park, M. H. Ryu, U. K. Kim, J. Lee, D. S. Hwang, ACS Appl. Bio Mater., **3** (2020) 7762-7768.