(YAP, orthorhombically distorted perovskite structure), yttrium aluminium garnet (YAG, cubic), Lu_2SiO_5 (LSO, monoclinic), and of magnetite (spinel structure).

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Keywords: laue diffraction; optical materials; magnetic materials

FA2-MS02-P11

Control of Morphology, Size and Porosity of The Zinc Oxide by Chemical Additives. Bora Akin[a], Mualla Oner[a]. [a]*Yildiz Technical University, Chemical Engineering Department, Istanbul-Turkey.*
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In biological and synthetic systems, control of crystal morphology, porosity and size are very important. Many works focused different types of minerals, including $CaCO_3$, TiO_2, ZnS, ZnO, CdO, etc. [1] Zinc oxide (ZnO) is a unique material that exhibits semiconducting, piezoelectric, and pyroelectric multiple properties. Numerous chemical strategies have been reported to synthesize including controlled precipitation, hydrothermal and solvothermal methods, sol–gel, thermal decomposition of precursors, laser ablation, spray pyrolysis, oxidation of zinc metal, and microemulsion [2-6]. But many of these methods usually require high temperature. Therefore, it is important to develop processes for continuous production of uniform particle size distribution based on precise specifications for given use in low temperature. In this work, ZnO crystals have been prepared by mixing aqueous solutions of zinc nitrate and Hexamethylenetetramine (HMT) in the presence of latex particles and green polymer. Latex is an aqueous microemulsion based on styrene-acrylic copolymer. Polymer is environmentally friendly polysaccharide-based polycarboxylate, carboxymethyl inulin (CMI). Zinc oxide (ZnO) were synthesized by homogeneous precipitation method and were characterized by SEM, X-ray diffraction analysis, BET and zeta sizer. The effects of the latex particles and green polymer on the crystal growth, morphology and crystalline structure of the resulting zinc oxide were studied by SEM, X-ray diffraction analysis, BET and zeta sizer. The additives affect the dimension, morphology and particle size distribution of the crystals. The reduction in size is greater in the direction of the c-axis. The SEM micrograph shows the formation of well-crystallized, agglomerated small particles of ZnO. The mean size of the subunit determined by XRD is smaller than that of the surface of the grain observed in SEM. The porous ZnO were mainly manufactured by removal of the additives via heat treatment. The additive concentration, sintering time and sintering temperature were varied to investigate their influence on the quality of the porous matrix.

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Keywords: zinc compounds; crystallization; biopolymers

FA2-MS02-P12

Synthetic Dimetaborates *REE*$Al_{1.67+0.67x}(B_4O_{10})O_x$ ($x \leq 1$) (*REE* = La, Ce, Nd, Pm, Sm, Eu): Crystal-Chemical Study and Comparison with Natural Counterpart Peprossiite-(Ce). Francesco Capitelli[a], Nikolay I. Leonyuk[b]. [a]*Institute of Crystallography-CNR, Roma, Italy,* [b]*Faculty of Geology, Moscow State University, Moscow, Russia.*
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In the present work we relate a crystal chemical study of a series of synthetic dimetaborates with composition *REE*$Al_{1.67+0.67x}(B_4O_{10})O_x$ ($x \leq 1$) [1] (*REE* = La, Ce, Nd, Pm, Sm, Eu) performed by single-crystal X ray diffraction. The samples were obtained by slow cooling from $K_2Mo_3O_{10}$ based fluxed melts in the form of transparent hexagonal sheet-like crystals. Structure refinements showed all the phases to be isostructural within hexagonal space group P-*62m* with mineral peprossiite-(Ce) (a = 4.612(1) Å; c = 9.374(3) Å and V = 172.6 Å^3) [2], a late pegmatitic - hydrothermal phase from holocrystalline ejecta of the Vico volcanic complex (Italy). The *REE* cations present a trigonal prismatic coordination; Al cations are surrounded by five oxygen atoms, resembling a square pyramidal coordination, BO_4 groups display tetrahedral arrangement. The three-dimensional framework can be described as a packing of *REE*O_6, BO_4 and AlO_5 polyhedral layers perpendicularly to the crystallographic c axis, held together by strong *REE*…O and Al…O interactions.

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Keywords: dimetaborates; rare earth elements (*REE*); peprossiite-(Ce)

FA2-MS02-P13

Influence of F^-/OH^- Exchange on the Morphology of Apatite-Gelatine-Composites. Yigit Öztan[a], Paul Simon[a], Rüdiger Kniep[a]. [a]*Max Planck Institute for Chemical Physics of Solids. Dresden, Germany.*
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Biomimetic apatite–gelatine nanocomposites are grown in a double diffusion setup, where calcium chloride and disodium hydrogen phosphate / sodium fluoride stock solutions diffuse through a gelatine gel from opposite ends under controlled temperature conditions. Composite aggregates are found in periodic growth zones within the gel (Liesegang Bands) and exhibit a hierarchical resemblance to apatite-collagen system found in bone and teeth [1].