crystalline apatite materials is the role of physical and chemical factors in crystallographic orientation and shape evolution of crystals in biocomposite structure. Taking proper account of natural capability for selfassembly and preferred growth direction along *c* axis of apatite crystals one can use a substrate to provide highly textured dense apatite in the form of bulk material or coating, varying crystallinity and porosity of material by solution composition and experimental conditions.

The purpose of the current work is studying the effect of supersaturation, temperature and growth inhibitors on microarchitecture of inorganic material by the example of bioinspired growth of FAP crystals on 2D template in $Ca^{2+} – PO_4^{3-} – F^- – H_2O$ system.

Highly (0001) oriented polycrystalline calcium fluorapatite (FAP) on fictionalized titanium substrates is obtained. The characterization of obtained apatite material (composition, structure, crystal domain size) is performed by means of electron and X-ray diffraction, X-ray photoelectron spectroscopy, scanning and transmission electron microscopy. Texture degree is determined by means of rocking curves. Intervals of parameters of monophase fluorapatite formation are determined. It is shown that the initial step of fluorapatite formation in aqueous solution is amorphous calcium phosphate. Physical and chemical conditions required for FAP texturing during column crystals formation are determined. It is shown that lower supersaturation leads to formation of highly textured dense FAP whereas coloumn FAP structures grow at high supersaturations. It is shown that the presence of aminoacids in solution reduces density and texture of polycrystalline FAP.

15:15	Oral

Bioinspired design of $SrAl_2O_4:Eu^{2+}$ phosphor

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A cellular phosphor material based on $Sr_{0.97}Al_2O_4:Eu_{0.03}$ was manufactured via vacuum assisted infiltration of wood tissue (*Pinus sylvestris*) with a precursor nitrate solution. The major crystalline phase was monoclinic $SrAl_2O_4$, detected by X-ray diffraction (XRD). Due to the uniform arrangement of rectangular shaped tracheidal cells of the pine wood specimens, the nitrate solution penetrated homogeneously into the porous structure. The microstructure of the biotemplated $Sr_{0.97}Al_2O_4:Eu_{0.03}$ phosphor was examined by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Energy-dispersive X-ray analysis (EDX) proved the homogeneous conversion of the wood cell wall into $Sr_{0.97}Al_2O_4:Eu_{0.03}$ struts. The optical properties of the resulting phosphor material were determined by photoluminescence spectroscopy (PL) at room temperature and cathodoluminescence spectroscopy (CL) in the SEM. The biotemplated $Sr_{0.97}Al_2O_4:Eu_{0.03}$ showed a characteristic green emission at 530 nm (2.34 eV). Shaping biomorphous $SrAl_2O_4.Eu^{2+}$ phosphor with a microstructure pseudomorphous to the bioorganic template anatomy offers novel approach for designing highly oriented phosphor materials to be used in two dimensional detector arrays.

Joint Poster Session II

Poster Award Ceremony
Wednesday afternoon, 17 September, 16:00
Main Hall

Thursday, 18 September

Session 3

as a part of Symposium L
Thursday morning, 18 September, 9:00
Room 213

9:00	Invited oral

Bacilli, green algae, diatoms and red blood cells – how biology inspires novel materials in nanoarchitectural applications

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Biogenic material with functional units in the micro- and nanometer regime has already inspired novel micro- and nanotechnological applications [1].

Examples presented comprise

- scanning force spectroscopy investigations on UV-resistant bacterial spores, showing distinct differences in indentation depth to UV-sensitive spores [2],
- highly efficient biogenic single photon detectors [3],
- natural micromechanical systems made of nanostructured silica [4],
- a novel method for rapid screening of diabetes in lab-on-a-chip applications, based on nanodiagnostics on red blood cells performed with atomic force spectroscopic methods [5], and
- the application of bioinspired nanotechnology in architecture and building industry.

The outlook and discussion will deal with the possible activation of architectural elements by integration of sensing and actuation devices and nanotechnology in building technology (filters etc) and bioinspired nanotechnology still in the research stage.

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