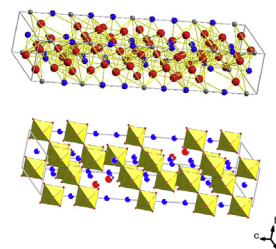




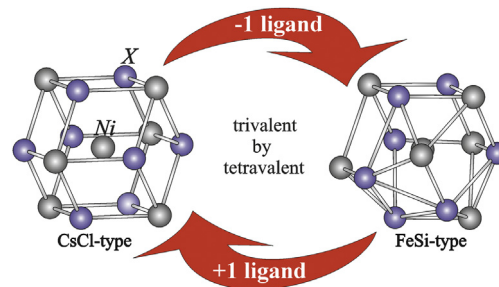
## Graphical abstracts

**Synthesis and crystal structure of the  $A_6B_5O_{18}$  perovskite-like compounds**

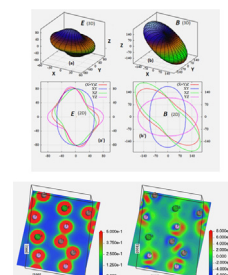
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V.V. Polubinskii<sup>a</sup>, Y.A. Titov<sup>a,\*</sup>, N.M. Belyavina<sup>a</sup>, V.Ya. Markiv<sup>a</sup>, M.S. Slobodyanik<sup>a</sup>, V.V. Chumak<sup>b</sup>, O.I. Nakonechna<sup>a</sup><sup>a</sup>Taras Shevchenko University, 64/13, Volodymyrska Str., 01601 Kyiv, Ukraine<sup>b</sup>Ivan Franko State University, 40, Velyka Berdychivska Str., 10008 Zhytomyr, Ukraine**Stabilization of an FeSi-type modification of the ternary  $NiGa_{0.82}Si_{0.18}$ ,  $NiGa_{0.84}Ge_{0.16}$  and  $NiAl_{0.46}Si_{0.54}$  phases**

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Pavlo Lyutyi<sup>a,c,\*</sup>, Oliver Niehaus<sup>b</sup>, Rainer Pöttgen<sup>b</sup>, Piotr Bragiel<sup>c</sup>, Michal Piasecki<sup>c</sup>, Volodymyr Svitlyk<sup>b,d</sup>, Anatolii Fedorchuk<sup>e</sup><sup>a</sup>G.V. Karpenko Physico-Mechanical Institute of the NAS of Ukraine, Naukova Str., 5, UA-79601 Lviv, Ukraine<sup>b</sup>Institut für Anorganische und Analytische Chemie, Universität Münster, Corrensstrasse 30, Münster D-48149, Germany<sup>c</sup>Institute of Physics, J. Dlugosz University Częstochowa, Armii Krajowej 13/15, Częstochowa, Poland<sup>d</sup>ID27 High Pressure Beamline, ESRF, BP220, 38043 Grenoble, France<sup>e</sup>S.Z. Gzhytskyj Lviv National University of Veterinary Medicine and Biotechnologies, Pekarska Str., 50, UA-79010 Lviv, Ukraine**Structural, elastic, electronic and optical properties of the newly synthesized monoclinic Zintl phase  $BaIn_2P_2$** 

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N. Guechi<sup>a</sup>, A. Bouhemadou<sup>b,\*</sup>, R. Khenata<sup>c</sup>, S. Bin-Omran<sup>d</sup>, M. Chegaar<sup>e</sup>, Y. Al-Douri<sup>f</sup>, A. Bourzami<sup>a</sup><sup>a</sup>Laboratoire d'Etudes des Surfaces et Interfaces des Matériaux Solides (L.E.S.I.M.S.), Département de Physique, Faculté des Sciences, Université de Setif 1, 19000 Setif, Algeria<sup>b</sup>Laboratory for Developing New Materials and their Characterization, Department of Physics, Faculty of Science, University of Setif 1, 19000 Setif, Algeria<sup>c</sup>Laboratoire de Physique Quantique et de Modélisation Mathématique (LPQ3M), Département de Technologie, Université de Mascara, 29000 Mascara, Algeria<sup>d</sup>Department of Physics and Astronomy, College of Science, King Saud University, P.O. Box 2455, Riyadh 11451, Saudi Arabia<sup>e</sup>Department of Physics, Faculty of Science, University of Setif 1, 19000 Setif, Algeria<sup>f</sup>Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia

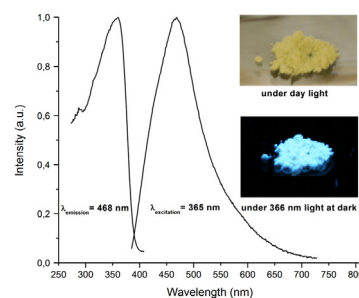
### Preparation via the polymer route and photoluminescence properties of $\text{CeSi}_3\text{N}_5$

Hasan Cakmak, Martin Jansen\*

Max Planck Institute for Solid State Research, Heisenbergstrasse 1, 70569 Stuttgart, Germany

$\text{CeSi}_3\text{N}_5$  was prepared via the polymer route, a one-pot and liquid-phase synthesis.  $\text{CeSi}_3\text{N}_5$  has a broad emission band at 468 nm, when excited with 365 nm light. This makes it a good candidate for use as a blue phosphor, which can be pumped by near-UV-LEDs.

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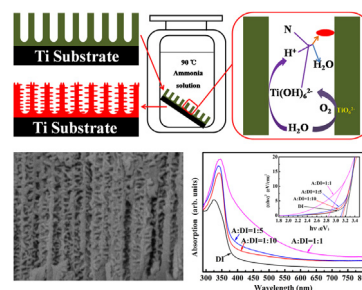
### Preparation of nitrogen-doped anatase $\text{TiO}_2$ nanoworm/nanotube hierarchical structures and its photocatalytic effect

Xian Hou<sup>a</sup>, Cheng-Wei Wang<sup>a,\*</sup>, Wei-Dong Zhu<sup>a</sup>, Xiang-Qian Wang<sup>a</sup>, Yan Li<sup>a</sup>, Jian Wang<sup>a</sup>, Jian-Biao Chen<sup>a</sup>, Tian Gan<sup>a</sup>, Hai-Yuan Hu<sup>b</sup>, Feng Zhou<sup>b</sup>

<sup>a</sup>Key Laboratory of Atomic and Molecular Physics & Functional Materials of Gansu Province, College of Physics and Electronic Engineering, Northwest Normal University, Lanzhou 730070, China

<sup>b</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Science, Lanzhou 730000, China

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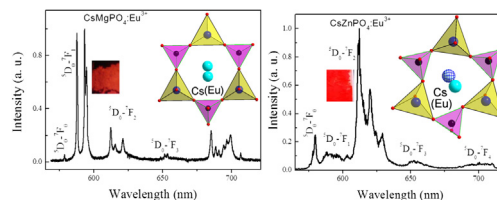
### Structure-dependent luminescence properties of $\text{Eu}^{3+}$ -doped $\text{CsBPO}_4$ ( $\text{B} = \text{Mg}, \text{Zn}$ )

Ruijin Yu\*, Hongjuan Li, Hailong Ma, Caifeng Wang, Huan Wang

College of Science, Northwest A&F University, Yangling, Shaanxi 712100, PR China

$\text{Eu}^{3+}$  has structure-dependent transitions due to the special microstructure occupied in a given host. The different surroundings of  $\text{Eu}^{3+}$  ions in  $\text{CsMgPO}_4$  and  $\text{CsZnPO}_4$  induce the different luminescence properties.  $\text{CsMgPO}_4:\text{Eu}^{3+}$  presents the dominant reddish-orange emission from  ${}^5\text{D}_0 \rightarrow {}^7\text{F}_1$  and a long luminescence lifetime. In contrast,  $\text{CsZnPO}_4:\text{Eu}^{3+}$  has a pure red color with the dominant  ${}^5\text{D}_0 \rightarrow {}^7\text{F}_2$  and a fast decay.

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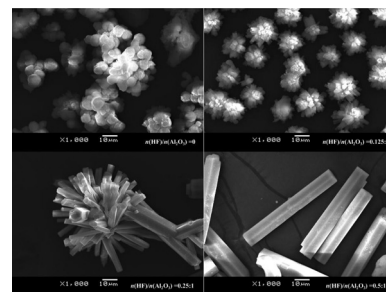
### Synthesis and crystal morphology control of $\text{AlPO}_4$ -5 molecular sieves by microwave irradiation

Wei Yang<sup>a</sup>, Yu Song<sup>a,\*</sup>, Ying Mu<sup>b</sup>, Shangru Zhai<sup>a</sup>, Yinghuan Fu<sup>a</sup>, Qingda An<sup>a</sup>, Bin Zhai<sup>a</sup>, Xiaowei Song<sup>b</sup>

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