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## Structural and spectroscopic insights into Sodium-Europium(III) orthophosphate

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Recently, increasing attention has been tuned to luminescence behaviour related to structure specialty of phosphor materials because microstructure of host material decides the fluorescence properties [1]. Phosphate is a good type of candidate for its reasonably large band gap, high thermal and chemical stability. The basic building block of phosphates is the PO4 tetrahedron and EuOx, which is flexible and can inhabit various coordination environments by altering the Eu-O bond lengths in the wide range of 2.55⊠3.13 Å [2]. Moreover, combining EuOx octahedra with PO4 tetrahedra may construct various structures in which these polyhedra are interconnected via common O atoms.

Although the spectroscopy of K3Eu(PO4)2 has been currently well studied, replacing the cation with sodium can have a positive effect on the properties of the obtained Na3Eu(PO4)2. Based on single crystal data, the structure consists of PO4 tetrahedra and isolated europium polyhedra, which together form the structural type of glaserite.

The synthesis of Na3Eu(PO4)2 has been carried out by single crystal growth technique and by the solid-state method. The peculiarities of Na3Eu(PO4)2 as a perspective phosphor has been discussed taking into consideration IR, luminescence spectroscopy and X-ray single crystal diffraction analysis.

- 1. Qin, D., & Tang, W. (2017). Crystal structure, tunable luminescence and energy transfer properties of Na 3 La (PO 4) 2: Tb 3+, Eu 3+ phosphors. RSC Advances, 7(5), 2494-2502.
- Ju, G., Hu, Y., Chen, L., Wang, X., Mu, Z., Wu, H., & Kang, F. (2012). A reddish orange-emitting stoichiometric phosphor K3Eu (PO4) 2 for white light-emitting diodes. Optics & Laser Technology, 44(1), 39-42.

## Type of presence

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