

## Structural and luminescent properties of nanostructured KGdF<sub>4</sub>:Eu<sup>3+</sup> synthesised by coprecipitation method.

### Autorzy

Mirosław Karbowskiak

A. Mech

Artur Bednarkiewicz

Wiesław Stręk

### Rok wydania

2004

### Czasopismo

Journal of Alloys and  
Compounds

### Numer woluminu

380

### Strony

321-326

### DOI

10.1016/j.jallcom.2004.03.030

### Kolekcja

Naukowa

### Język

Angielski

### Typ publikacji

Artykuł

### Streszczenie

The single-phase low-temperature cubic form of KGdF<sub>4</sub>, with the average crystallites size of 19 nm precipitates from a solution. The cubic phase is stable up to approximately 460 °C. At higher temperatures the cubic KGdF<sub>4</sub> transforms, first to the orthorhombic and then to the trigonal phase, however, the transformation is not complete and the cubic form is still present. The highest concentrations of orthorhombic and trigonal phases were observed at temperatures of 540 and 720 °C, respectively. The single-phase high-temperature cubic form of KGdF<sub>4</sub> was obtained when the as-received sample was heated at 790 °C. In contrast to a coprecipitation (CP) method, the single-phase orthorhombic modification of KGdF<sub>4</sub> was obtained by a solid state (SS) reaction conducted at 650 °C. In excitation spectra recorded for CP samples the characteristic Eu<sup>3+</sup>-O<sup>2-</sup> CT bands expected at ~260 nm are not present, which indicates that oxygen impurities are practically absent. However, both IR spectra and the emission branching ratio points to the presence of OH<sup>-</sup> groups incorporated into a fluoride lattice and a heat treatment at temperature of at least 650 °C is indispensable to get rid of them. Emission spectra for samples with different processing conditions were recorded and are discussed.

### Słowa kluczowe

Phosphors, Nanostructures, Morphology, Precipitation,  
Luminescence, KGdF<sub>4</sub>

### Adres publiczny

<https://doi.org/10.1016/j.jallcom.2004.03.030>

### Strona internetowa wydawcy

<http://www.elsevier.com>

