Session	Poster Session
Date	NOVEMBER 21, 2019, THURSDAY
Time	15:00 - 16:00
Hall	TOPKAPI FOYER

NEW GLASS CERAMIC LUMINESCENT MATERIALS FOR A WIDE APPLICATION

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Development of new cheap and effective luminescent materials is one of the vital tasks in materials science. It is related its tremendous applications in different fields including high energy physics, photonics, medicine, lighting, agriculture and others. Among them iodides of alkaline earth elements doped with Eu2+ are attractive due to relatively low cost and good optical properties. Main problems restraining their wide application are hygroscopicity and structural anisotropy. The first one needs encapsulation of phosphor in hermetic transparent container for its protection from moisture, while the second makes difficult synthesizing crystals of high volume. Both problems may be solved by obtaining phosphors in glass ceramic form. All approaches for glass ceramics synthesis may be divided in 2 groups: (i) mixing powders of initial phosphors and glasses with subsequent heat treatment; (ii) growth of phosphor directly in glass during crystallization. Due to hygroscopicity and low thermal stability of alkaline earth elements iodides first approach is more suitable for its synthesis. Thus, the aim of this work is development of the method of glass ceramics based on iodides of alkaline earth elements doped with Eu2+ synthesis, study its structural, morphological and luminescent properties. The glass ceramic samples were prepared by immerging MI2:Eu (M = Mg, Ca, Sr, Ba) powders into glass matrix under heat treatment. MI2:Eu powders were obtained using 2 stages approach: the first stage involved synthesis by a reverse precipitation of MCO3:Eu that were converted into MI2:Eu in the second stage. The XRD data confirm the used synthesis approach being universal for obtaining MI2:Eu samples in powders and glass ceramic forms. The PL bands for these samples correspond to the luminescence of Eu2+ and Eu3+ in MI2, allowing to obtain final glass ceramics with emission color varying from blue to red depending on the composition.

Keywords: *luminescence, eu2+, glass ceramic, iodides*