## Physico-Chemical nanomaterials science

# Influence of Mg on luminescent characteristics of ZnS:Mn, obtained by self-propagating high-temperature synthesis.

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In this work the luminescent characteristics and elemental composition of high-dispersive ZnS:Mn, obtained by self-propagating high-temperature synthesis (ZnS:Mn-SHS), before and after thermal treatments were investigated.

Scanning electron microscopy investigations of initial and annealed ZnS:Mn,Mg-SHS powders have showed that in both cases powders consist of particles with the sizes from 10 nm to 10 mkm. At the same time, the amount of fine fraction in the material has increased and the elemental composition of ZnS:Mn,Mg-SHS has changed after annealing. The elemental composition becomes non-stoichiometric after powder annealing due to the evaporation of volatile elements such as sulfur.

Photoluminescent investigations demonstrated that the simultaneously doping of ZnS by Mn and Mg during the SHS leads to intensity increasing of short-wave emission band in the photoluminescent spectrum of ZnS:Mn,Mg-SHS. Simultaneously the general emission rate of investigated material has increased. The emission band, that corresponds to the Mn, becomes dominant in the photoluminescent spectrum after annealing while the band associated with the self-activated emission decreased approximately in 10 times. Moreover, the analysis of obtained data showed that the powder thermal treatment after synthesis conduces more uniform distribution of Mn in the received luminophore ZnS:Mn,Mg-SHS.