Influence of flux content on photo-, thermo- and mechanoluminescence properties of Mn^{2+} doped ZnS/CaZnOS heterojunction materials

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Photo-, thermo- and mechanoluminescence properties of ZnS/CaZnOS heterojunctions doped with d- and f-block elements have already been described in the literature[1–4]. The emission properties of these heterojunctions are strongly dependent on the dopant ion and its concentration[1,2]. During synthesis, the use of flux compounds is a well-established approach to tailor physicochemical properties and enhance the crystallinity of the resulting materials[1,2,5]. Moreover, this heterostructure is capable of exhibiting persistent luminescence under radiation stimuli[6].

Here, we present results for Mn^{2+}-doped ZnS/CaZnOS heterostructures, focusing on the influence of the flux compound content on their photo-, thermo- and mechanoluminescence properties. Optical properties were strictly dependent on the synthesis conditions./Synthesis conditions were crucial for optimization of optical properties of the Mn^{2+}-doped ZnS/CaZnOS heterostructure. The results provide insight into the role of flux-assisted synthesis in the luminescent performance under different stimuli and demonstrate the potential of these heterojunctions for advanced optoelectronic and sensing applications.

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