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STRONTIUM OXYNITRIDE PHOSPHOR DOPED WITH Eu^{2+} IONS: PHASE PURITY/OPTICAL PROPERTIES RELATIONSHIP

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Eu^{2+} -doped $\text{SrSi}_2\text{O}_2\text{N}_2$ was prepared via a gas pressure method or a solid state reaction method with various amount of Na_2CO_3 fluxing agent. The phase composition of obtained materials was studied using X-ray diffraction. The local environment of the activator ions in the structure was examined using X-ray absorption near-edge spectroscopy (XANES). The photoluminescent properties were investigated by emission, excitation and quantum efficiency measurements. Decay times and thermal stability of the powders were determined as well.

Obtained results show that nitrogen and CO partial pressure during the process of synthesis influence the phosphor crystallization. It has been found that usage of Na_2CO_3 flux improves crystallization of the desired phase, enhancement of optical properties was also visible. An optimum concentration of the flux was 5 wt% since exceeding this value resulted in formation of an excessive amount of glassy phase, as well as some evidence of the secondary phase formation.