# Comparative study of crystal field analysis in $Pr^{3+}$ and $Yb^{3+}$-doped $K_2LaX_5$ (X= $Cl^-$, $Br^-$) ternary halides and $Yb^{3+}$-doped $A_3Lu(PO_4)_2$ (A=$Na^+$, $Rb^+$) double phosphates. Charge transfer band observations of $Yb^{3+}$-doped systems.

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The spectroscopic properties of praseodymium and ytterbium-doped ternary halides of $K_2(La,Ln)X_5$ (X=$Cl^-$, $Br^-$) type and ytterbium-doped double phosphates of formula $A_3Lu(PO_4)_2$ (A=an alkali metal: Na, Rb) were presented. Absorption, emission and luminescence excitation spectra were measured at 4, 10 and 293K in the wide spectral range (VUV–IR). Luminescence of the samples was excited using various pumping lines, including the synchrotron radiation. In the $Pr^{3+}$ ion systems the Stark components determined from the absorption and emission spectra were simulated by using a phenomenological crystal field model for $4f^2$ configuration of the $Pr^{3+}$ ion in the $K_2(La,Pr)X_5$ crystals. The difference in the emission behaviour of the ternary chloride and bromide crystals were explained basing on C.F. effect and vibrational mode in the discussed systems.For the $Yb^{3+}$ -doped samples the strong fundamental $^2F_{5/2} \rightarrow {}^2F_{7/2}$ emission in the IR range as well as the CT emission bands were observed. The influence of the host lattice on charge transfer luminescence was investigated. The temperature effect and mechanisms of the observed phenomena are discussed.

Słowa kluczowe

Pr3+ ion, Yb3+ ion, Charge transfer emission, Crystal field calculation, Ternary halides, Double phosphates

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