

## **Spectral characteristics of solid solutions $\text{LiY}_{1-x}\text{Lu}_x\text{F}_4$ doped by $\text{Ce}^{3+}$ ions**

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### **Abstract**

During crystallization, the  $\text{LiF-YF}_3\text{-LuF}_3$  compounds form a continuous series of solid solutions having a scheelite structure at any proportion of the  $\text{YF}_3$  and  $\text{LuF}_3$  components. It is established that the crystals conform to the Vegard law and the Rutgers rule. The spectral characteristics of the 5d-4f transitions of  $\text{Ce}^{3+}$  ions and color centers induced by ultraviolet radiation in these crystals were studied as a function of the  $\text{Lu}^{3+}$  concentration. It is shown that the active media based on  $\text{LiF-YF}_3\text{-LuF}_3\text{:Ce}^{3+}$  solid solutions are more efficient as compared to  $\text{LiYF}_4\text{:Ce}^{3+}$  and  $\text{LiLuF}_4\text{:Ce}^{3+}$  crystals in possible directional changes in the spectral-kinetic characteristics of impurity ions and the parameters of the losses induced by pumping radiation and in enhancement of energetic and spectral characteristics of lasers on their basis. © 2008 Pleiades Publishing, Ltd.

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