Study of the effect of thermal treatment on the emission spectrum from LiF:Mg,Cu,P compared to LiF:P

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Abstract
Thermoluminescence (TL) material of LiF:Mg,Cu,P was produced using standard GR200 dopant concentrations and its emission and absorption spectrums were measured after beta irradiation. The alterations resulting from various thermal treatments, exceeding the recommended temperatures namely 240°C on the TL and emission spectrums has been investigated. The main peak of absorption spectrum, which is relevant to F centers, doesn’t exhibit any difference to the absorption spectrum of LiF:Mg,Ti, which in turn demonstrates the dominant function of F centers in formation of trap centers in these two TL materials. The TL Material of LiF:Mg,Cu,P is sensitive to the temperatures higher than 240°C and the results show that the main peak of absorption spectrum shifts to lower wavelength with increasing the temperature to 400°C. Furthermore, the investigation of TL sensitivity from LiF:P at temperatures above 240°C confirms the role of P impurity in sensitivity reduction of LiF:Mg,Cu,P at temperatures higher than 240°C.

Keywords: thermoluminescence (TL), emission wavelength, thermoluminescence sensitivity, LiF:P, LiF:Mg,Cu,P

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