Optical parameters and dispersion behavior of potassium magnesium chloride sulfate single crystals doped with Co+2 ions

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Abstract:

Single crystals of potassium magnesium chloride sulfate (KMCS) doped with cobalt ions were grown by slow cooling method. Powder XRD study confirmed the monoclinic structure of the grown crystals. The functional group vibrations were checked through FTIR spectroscopy measurements. In optical studies, the absorbance behavior of the crystals and their optical energy gap were established by Tauc plot. The refractive index, the extinction coefficient and other optical constants were calculated for the grown crystals. The normal dispersion of the refractive index was analyzed according to single oscillator Sellmeier's model. The Urbach's rule was applied to analyze the localized states density in the forbidden gap.

Keywords:

KMCS single crystals Crystal growth X-ray powder diffraction Optical properties FTIR spectroscopy

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