

Theoretical Investigation of the Optical Spectrum and the Gyromagnetic g Factor of $\text{CdS}:\text{V}^{3+}$

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We present a covalence crystal field model based on a cluster approach for a $3d^2$ ion in a T_d system, in which not only the effect of the difference between the t_{2g} and e_g orbit but also a two spin-orbit coupling parameter model for the g factor is included. The model is applied to the calculation of the optical spectrum of $\text{CdS}:\text{V}^{3+}$ in the T_d system and the gyromagnetic factor in the trigonal system. The calculated results agree well with experimental findings.

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