

# Theoretical Investigation of the Optical Spectrum and the Gyromagnetic *g* Factor of CdS:V<sup>3+</sup>

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We present a covalence crystal field model based on a cluster approach for a 3d<sup>2</sup> ion in a T<sub>d</sub> system, in which not only the effect of the difference between the t<sub>2g</sub> and e<sub>g</sub> 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 CdS:V<sup>3+</sup> in the T<sub>d</sub> system and the gyromagnetic factor in the trigonal system. The calculated results agree well with experimental findings.

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