Theoretical Studies of the EPR $g$ Factors and the Hyperfine Structure Constants of Cr$^{3+}$ in MgS and SrS

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The EPR $g$ factors and the hyperfine structure constant $A$ factors for Cr$^{3+}$ in MgS and SrS are theoretically studied by using the two-spin-orbit (S.O.)-coupling-coefficient formulas for a 3d$^3$ ion in octahedra based on the cluster approach. In these formulas, both the contributions due to the S.O. coupling coefficient of the central 3d$^3$ ion and that of ligands are taken into account. Based on these studies, the $g$ and $A$ factors of Cr$^{3+}$ in both MgS and SrS are satisfactorily explained. The results are discussed.

Key words: EPR; Crystal- and Ligand-fields; Cr$^{3+}$; MgS; SrS.