

Optical spectroscopy of six coordinated Eu^{2+} and Ce^{3+} in $\text{M}^{2+}\text{Al}_2\text{B}_2\text{O}_7$ ($\text{M}^{2+}=\text{Ca}, \text{Sr}, \text{Ba}$)

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Detailed analysis of the excitation and emission spectra of Eu^{2+} and Ce^{3+} in the compound $\text{M}^{2+}\text{Al}_2\text{B}_2\text{O}_7$ ($\text{M}^{2+}=\text{Ca}, \text{Sr}, \text{Ba}$) is reported. The M^{2+} ion is octahedrally coordinated in this structure. The crystal field splitting, Stokes shift and thermal quenching along with the Hyung-Rhys parameter and the phonon frequencies are reported for the first time for the Eu^{2+} ion in these compounds. The optical data is then compared to the structural aspects of the host lattice. The optical properties are also compared with those reported for the Eu^{2+} ion in $\text{Cs}_2\text{M}^{2+}\text{P}_2\text{O}_7$ [$\text{M}^{2+}=\text{Ca}, \text{Sr}, \text{Ba}$] structure [1]. We also discuss and compare the optical properties of Eu^{2+} and the Ce^{3+} ions in these materials.

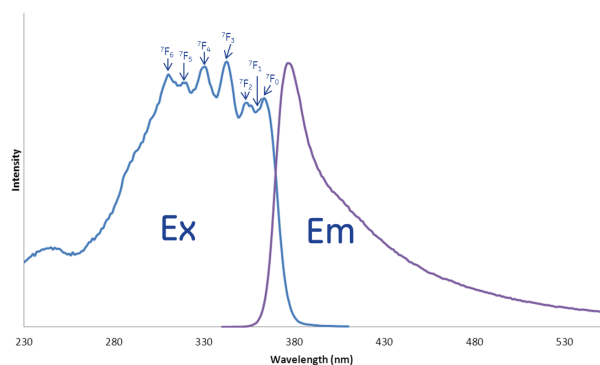


Figure 1: The room temperature excitation and emission spectrum of Eu^{2+} doped $\text{BaAl}_2\text{B}_4\text{O}_7$

References

[1] A. M. Srivastava, H. A. Comanzo, S. Camardello, S. B. Chaney, M. Aycibin and U. Happek, *Journal of Luminescence*, 129 (2009) 919.