

The temperature dependence of the stress dichroism was used to evaluate the effect of the quadratic electron-lattice interaction. This effect was found to be of the same order of magnitude as that due to the resonance mode. It is positive for the A- and B-bands and negative for the D-bands.

The temperature dependence of the stress dichroism in the D-bands gives evidence of a small off-centre effect in the excited states. This is explained as a result of the small coupling to I_3^+ - and I_5^+ -lattice vibrations which made higher-order coupling to odd modes observable. The D-bands are understood to have a strong ligand character which favours this coupling.

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References

- [1] K. FUSSGÄNGER, Thesis, Frankfurt/Main 1968.
- [2] K. FUSSGÄNGER, W. MARTIENSSEN, and H. BILZ, phys. stat. sol. **12**, 383 (1965).
- [3] F. SEITZ, J. chem. Phys. **6**, 150 (1938); Rev. mod. Phys. **23**, 328 (1951).
- [4] W. DULTZ, Diploma Work, Frankfurt/Main 1966.
- [5] H. DRICKAMER and A. BALCHAN, Modern very High Pressure Technique, 1962.
- [6] S. SCHNATTERLY, Phys. Rev. **140**, A1364 (1965).
- [7] D. BIMBERG, W. DULTZ, and W. GEBHARDT, phys. stat. sol. **31**, 661 (1969).
- [8] W. GEBHARDT and E. MOHLER, phys. stat. sol. **14**, 149 (1966); **15**, 255 (1966).
- [9] D. FRÖHLICH, B. STAGINUS, and T. CAPS, Solid State Commun. **6**, 173 (1968).
- [10] D. DEXTER, Solid State Phys. **6** (1958).
- [11] G. BUSSE, W. PRETTL, and L. GENZEL, Phys. Letters (Netherlands) **27A**, 438 (1968).
- [12] W. GEBHARDT and K. MAIER, phys. stat. sol. **8**, 303 (1965).
- [13] G. KOSTER, J. DIMMOCK, R. WHEELER, and H. STATZ, Properties of the Thirty-two Point Groups, Cambridge 1966.
- [14] I. NOLT and A. SIEVEKS, to be published.

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