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$K\alpha_1$ and $K\alpha_2$ wavelengths for sodium and magnesium.

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Abstract

The wavelengths of the $K\alpha_1$ and $K\alpha_2$ X-ray lines for Na and Mg are determined from the fine-structure splitting of the inverted doublets of the appropriate gas-phase ions and the experimental wavelengths of the unresolved blended lines.

Values are given for X-ray wavelengths in the authoritative review of Bearden (1967), with $K\alpha_1$ and $K\alpha_2$ wavelengths separately tabulated for $Z \geq 13$.

By making use of the fine-structure splitting of the inverted doublet for the nine-electron isoelectronic ions, given by Moore (1971) as 1364 cm^{-1} for Na^{2+} and 2226 cm^{-1} for Mg^{3+}, one is able to find the wavelengths of the two lines by means of

$$E(^2P_{1/2}) - E(^2P_{3/2}) = \frac{10^8}{n}\left[\frac{1}{\lambda_{K\alpha_1}\,(\text{Å}^*)} - \frac{1}{\lambda_{K\alpha_2}\,(\text{Å}^*)}\right],$$

together with the intensity ratio of 2:1 and Bearden's weighted average of the unresolved blended line positions of 11·9101 and 9·8900 Å* respectively. The refractive index n is given by Bearden as differing from unity by 160 p.p.m. in this region of the spectrum.

The results turn out to be 11·9095 and 11·9114 (Na) and 9·8893 and 9·8915 (Mg) Å* units for $K\alpha_1$ and $K\alpha_2$ respectively.

A tabulation of fine-structure splittings calculated in the above manner from Bearden's experimental wavelengths for the eight elements Al through Ca *vs* the optical splitting data of Moore shows agreement in each case within the experimental error quoted by Bearden (Riter, 1979).

References

Bearden, J. A. (1967). *Rev. Mod. Phys.* **39**, 78–124.

Moore, C. E. (1971). *Atomic Energy Levels*. Vol. I. Natl Stand. Ref. Data Ser., Natl Bur. Stand. (US Govt Print. Off., Washington, DC) No. 35. Reissue of NBS Circ. 467, Vol. I (1949), with which it is identical for the energy levels under consideration in this work.

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Twelfth General Assembly and International Congress of Crystallography

The Twelfth General Assembly of the IUCr and the Twelfth International Congress of Crystallography will be held in Ottawa, Canada, at Carleton University, under the sponsorship of the National Research Council of Canada, 16–25 August 1981. Registration will take place on Sunday 16 August. The Congress will open on Monday 17 August and sessions will continue until Tuesday 25 August.

The scientific programme will include invited general lectures, invited oral papers and open Commission meetings. Most contributed papers will be presented in poster sessions. Commercial and non-commercial apparatus will be exhibited and crystallographic data file demonstrations are planned. The Congress will cover recent advances in all aspects of crystallography.

Dr L. D. Calvert is Chairman of the Organizing Committee, and Dr F. R. Ahmed is Chairman of the Programme Committee.

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