

AN X-RAY STUDY OF RUTHENIUM BIGUANIDE SULPHATE

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Biguanide combines with many elements of the transition series to give highly coloured chelate complexes of the inner-metallic type. Though the complex compounds of biguanide with copper (II) and nickel (II) were described more than three quarters of century ago, their structure forms a subject of controversy to the present time and a number of possible structures (Ray, 1961) have been proposed. The crystal structure of ruthenium salt of biguanide $[\text{Ru}(\text{C}_2\text{H}_7\text{N}_3)_3]_2(\text{SO}_4)_3 \cdot 7\text{H}_2\text{O}$ (Sen, 1962) has been undertaken in order to determine the nature of metal-biguanide bond

A sample of ruthenium biguanide sulphate was kindly made available to us by Dr. D. Sen, Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta. Crystals were prepared by slow evaporation of hot aqueous solution. The crystals were needle shaped, brownish yellow in colour. All these crystals have developed the forms {100}, {104} and {001}.

The parameters of the unit cell were determined by oscillation and Weissenberg photographs using $\text{CuK}\alpha$ radiation. The crystals were dusted with aluminium powder so as to standardize the radius of the camera.

The parameters are :

$$\begin{aligned} a &= 20.26 \text{ \AA} \pm .02 \\ b &= 11.65 \text{ \AA} \pm .05 \\ c &= 22.19 \text{ \AA} \pm .02 \\ \beta &= 117^\circ 48' \end{aligned}$$

Systematic extinctions were observed for (*hol*) when $l \neq 2n$, and for (*oko*) when $k \neq 2n$. The space group was therefore determined as P_{21}/C . This space group has four fold general positions and consequently one molecule of the chelate forms the asymmetric unit.

The density, obtained by flotation method in a mixture of Carbon tetrachloride and bromoform, was found to be 1.755 gm cm^{-3} . The calculated density for four molecules per unit cell is 1.754 gm.cm^{-3} . Further work is in progress.

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