

*The space-group and cell-dimensions of rankinite.*By Mrs. K. M. MOODY¹Crystallographic Laboratory, Cavendish Laboratory, University of
Cambridge

[Communicated by Dr. W. H. Taylor; taken as read November 6, 1952.]

TRICALCIUM disilicate, $\text{Ca}_3\text{Si}_2\text{O}_7$, which was first described by Shepherd and Rankin,² has been found in certain types of slag,^{3,4} and recently as a natural mineral at Scawt Hill, County Antrim, to which Tilley⁴ applied the name rankinite. The present work was undertaken after it was discovered that rankinite is formed when afwillite is heated to about 1000°C .⁵

Natural rankinite crystals were extracted from sections of the Scawt Hill rock, supplied by the Department of Mineralogy and Petrology, Cambridge. The sample also contained melilite and spurrite. Selection of the crystals was based on observations of refractive indices and interference colours, in the absence of other distinguishing features. Optical data published by Tilley were used as standards of reference.

Oscillation, Weissenberg, and Laue photographs were taken, using Cu- $K\alpha$ radiation. It was confirmed that rankinite is monoclinic, and concordant values of the cell-dimensions were obtained from three different crystals. The mean values, which are accurate to within ± 0.05 Å, are:

$$a\ 10.55, b\ 8.88, c\ 7.85, \beta\ 120.1^\circ \pm 0.5^\circ.$$

When reflections were indexed, it was found that $h0l$ was absent for h odd, and $0k0$ for k odd. There were no systematic hkl absences. The space-group is therefore $P2_1/a$.

The density was determined by means of a specific gravity bottle, using synthetic rankinite supplied by the Building Research Station. The value obtained was 2.96 g./c.c., from which it is concluded that there are four formula-units per cell. This gives a calculated density of 3.00 g./c.c.

A complete structure-analysis is to be attempted.

¹ Now at Woolwich Polytechnic, London.

² E. S. Shepherd and G. A. Rankin, *Journ. Indust. Eng. Chem.*, 1911, vol. 3, p. 211.

³ S. G. Gordon, *Amer. Min.*, 1923, vol. 8, p. 110.

⁴ C. E. Tilley, *Min. Mag.*, 1942, vol. 26, p. 190.

⁵ K. M. Moody, *Min. Mag.*, 1952, vol. 29, p. 838.