are probably accurate to ±0.0005 Å. The experimental conditions and results are given below:

Temperature	Time Hours	c/Z	a	$c/a\ Z$
586±5° C.	15	3.3747	4.1360	0.81593
832	65	3.3747	4.1350	0.81613
957	62	3.3741	4.1334	0.81630

The mean of the above ratios, 0.8161, is much nearer the theoretical value of 0.8165 than the earlier values. Whether the small difference remaining is real or not was not determined. However, the c/a ratio is less than 0.1% from the tetrahedral value.

In order to test whether the kind of flux used for crystallizing had a significant effect, a run at 515° C. for 237 hours was made with a flux consisting of a low melting temperature mixture of NaCl, KCl, and LiCl. The measured values, as in the above table, were 3.3747, 4.1356, 0.81601. One run at 900° C. for 3 hours with no flux gave 3.3750, 4.1356, 0.81608. These data are very similar to those of the first set.

The above results for hexagonal CdS crystallized at 550–950° C. in the presence of excess sulphur are:

$$a=4.1348\pm0.0015\ \text{Å},$$
$$c=6.7490\pm0.0010\ \text{Å},$$

when $Z=2$, and

$$c/aZ=0.8161\pm0.0002.$$

A NEW CENTRIFUGE TUBE FOR MINERAL SEPARATION[1]

E. H. Nickel,[2] *Mines Branch, Ottawa, Canada.*

Abstract

A centrifuge tube consisting of three components is described, which permits the efficient separation and removal of the sink and float fractions in heavy liquid separation.

Introduction

In the gravity separation of minerals using heavy liquids, centrifuging is frequently desirable and sometimes necessary. This procedure is particularly effective in the separation of minerals whose specific gravities are very similar, or with mineral powders which are very fine

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[1] Published by permission of the Deputy Minister, Department of Mines and Technical Surveys, Ottawa, Canada.

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grained. A difficulty frequently encountered in work of this type is the efficient recovery of the sink and float fractions after centrifuging. The device described below permits the rapid separation of the two fractions with very little contamination.

Description and Use of the Device

The device, shown in Figure 1, consists of three parts, the outer tube (A) which may be a test-tube, an inner collar (B), and a plunger (C).

The inner collar fits loosely into the outer tube and is supported by a lip at the upper end. Near the lower end there is a constriction with a ground surface to match that of the plunger. It is useful to flare the bottom of the collar almost to the outer tube so that if particles sink partly down and then rise again, they are funnelled back into the collar instead of into the space between collar and tube.

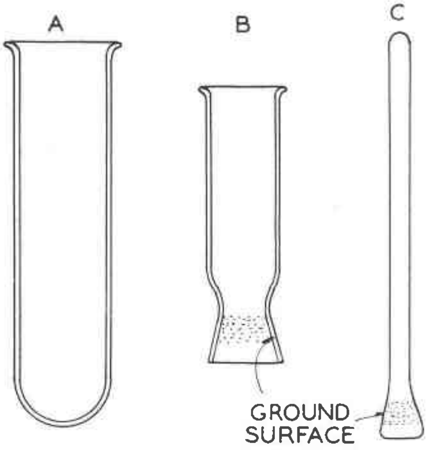

Fig. 1

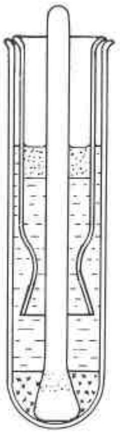

Fig. 2

The plunger should be somewhat longer than the outer tube and have a bulb at the lower end, somewhat wider than the constriction in the collar, and with a ground surface to match that in the collar.

In making this device it is important to have the sloping sides of the collar and plunger quite steep, to prevent mineral particles from adhering there.

The components are assembled as shown in Figure 2, and the liquid poured in. The mineral powder is then poured into the collar. If it is desired to stir the powder to separate the particles, this can be done by agitating a wire inserted from the top while keeping the plunger pulled up into the constriction; after stirring, the plunger can be lowered gently to the bottom of the tube.

The entire device is then centrifuged for an appropriate length of time. When removed from the centrifuge, the float portion is in the collar and the sink portion at the bottom of the test-tube. If the plunger is then grasped at its upper end and pulled upward it will close the collar and lift collar and contents out of the test-tube, leaving the sink portion at the bottom.

The components are preferably made of glass and the over-all size can be made to fit the tube-holder in use. The length of the collar relative to the tube may be varied depending on the amount of the sink fraction expected. Incidentally, the inner collar may be made from a test-tube having a smaller diameter than the outer one.

THE DISTRIBUTION OF MAJOR AND MINOR ELEMENTS AMONG SOME CO-EXISTING FERROMAGNESIAN SILICATES

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In a recent paper[1] the author discussed the distribution of some elements in co-existing biotite, hornblende and chlorite. Due to space considerations, the average values for each element were given, rather than the results of the separate spectrographic analyses. It has since been requested that the individual analyses be published to permit other workers to reanalyze the data for their own purposes.

In the following tables the atomic fractions of the elements in their sites in the mineral structures are given for each of the minerals analyzed. These have been recalculated from the weight percentages determined spectrographically. For the minor elements, below each table are given their minimum, maximum, and average amounts, in parts per million.

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[1] Nickel, E. H., *Am. Mineral.*, **39**, 486–493 (1954).