NOTES AND NEWS

REPRESENTATION OF THREE OR MORE COMPONENT SYSTEMS BY A RECTANGULAR GRAPHICAL METHOD

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A common convention for representing a 3-component system graphically is the Gibbs-Osann barycentric method using an equilateral triangle. Although the values of a system are easily comprehensible from the position of a plotted point relative to the end numbers represented in the three vertices of the triangle, the reading of percentages of the three components requires somewhat complicated measurements along lines perpendicular to the edges. In comparison with this, the use of rectangular coordinates has many advantages and can be achieved by either transformation of trilinear into Cartesian coordinates (cf. Mertie, 1948, and Krumbein, 1955), or by use of an isosceles right-angled triangle. Since the latter method evidently is not commonly used on this continent, the purpose is to draw attention to it.

In the method, the vertices of an isosceles right-angled triangle represent 100% of each component. The percentages corresponding to a plotted point are obtained from the two sides of the triangle and the distance from the point to the hypotenuse (third side) on a line parallel to the abscissa. It is obvious that the values of the ordinate are the same as the length of the extension of this parallel line from its intersection with the hypothenuse to the vertical side of a square of which the triangle is a half. The component percentages are thus represented by a line that is divided into three sections by the percentage values of the three components. This fact implies that not only three but also four or more components can readily be represented in such a triangle if the corresponding separating points are marked. The fourth component may conveniently be expressed as the length of a line parallel to the abscissa; the distances of the left end of the line from the ordinate and abscissa, respectively, represent two components and that from the right end to the hypothenuse, the third. Additional components can be expressed by means of adequate points with suitable indication that they belong to the same system.

This type of diagram was introduced by Bakhius Roozeboom in 1893 and completed by V. N. Lodochnikov for demonstration of the composition of igneous rocks. The method is now widely used for demonstration of chemical analyses or modal composition of rocks (Nikitin, 1946) but can be applied also to other features such as particle shape (cubic, flat, oblong) or physical property (good, fair, poor) of concrete aggregate, etc. Its greatest advantage, however, lies in the presentation of the chemical composition of rocks since four or more components are easily considered and can be directly expressed graphically on paper without reference to 3-dimensional figures (tetrahedron, equilateral bipyramid). For example, in igneous rock the following components can be plotted on paper: quartz, mafics (mafics, accessory minerals) and feldspars (plagioclase, K-feldspar). The diagram does not lose its value when rocks are compared for which the same number of components could not be determined because some components were not present in a

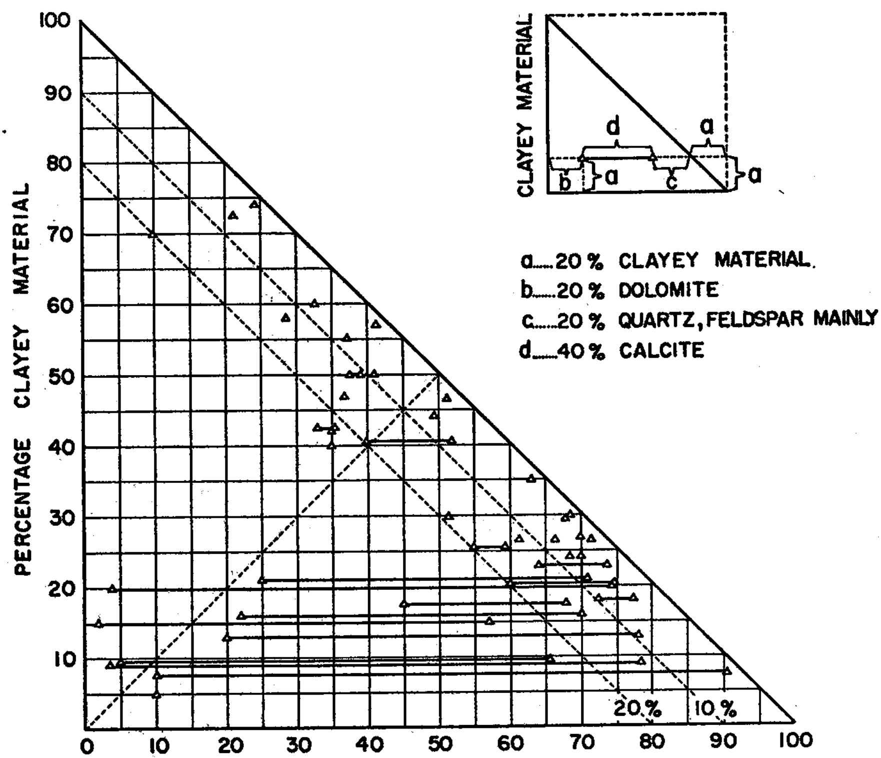

DIAGRAM OF COMPOSITION OF CHAZY SAMPLES DETERMINED FROM SHEEK ISLAND

FIG. 1. Four-component diagram of composition of chazy samples.

particular rock or the ratio between two components was not exactly known; for example, in a group of carbonate rocks with calcite, dolomite, clayey material and quartz/feldspar as components, dolomite was not present in all samples.

A disadvantage of plotting four and more components is that a diagram becomes difficult to use if many lines lie close to each other, hence, it is important to choose as the vertical component that which shows the greatest variation among the systems being graphically compared.

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A NEW TECHNIQUE IN CENTRIFUGAL MINERAL SEPARATION

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Introduction

The following is a description of an improved tube to give a rapid and efficient separation of sink and float products in the heavy mineral separation using bromoform and a centrifuge. This method is particularly applicable to very fine grained minerals and mineral powders. The main drawback to the use of the centrifuge has been the separation of the light and heavy fractions without contaminating one with the other. The apparatus described below gives a quick and clean separation of these two fractions.

Description and Use of the Apparatus

The apparatus, shown in Fig. 1, consists of three parts; the outer tube (A) which is a standard 15 ml. capacity centrifuge tube, the inner separation tube (B), and the rubber stopper (C).

The inner separation tube fits closely into the outer tube and is supported by a lip at its upper end. The inner tube tapers gently to a constriction, not exceeding $\frac{1}{8}$ of an inch in diameter, in the lower part