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On the plotting of binary and ternary diagrams by computer

A COMMON accessory to the larger computer installations is a Calcomp Plotter.[1] This equipment is programmed to accept a two-dimensional array as input, the output being a diagram on which the points are plotted relative to marked and scaled axes.

The library sub-routines with which the Plotter is programmed permit convenient labelling of the axes and a free selection of their length; any one of a variety of symbols may be chosen to portray the points in the plot. Division of the axes is made by the computer in accordance with the range of values present in the fed-in arrays; this is done in such a manner that the graph area determined by the axes is most economically utilized, subject to the use of rational divisions along the axes.

Whereas these arrangements are very convenient in that the minimum of attention need be paid for the production of a clearly labelled and accurately drawn graph, there are occasions when the user may wish to draw graphs that the standard routines do not permit. Examples from the broader field of mineralogy are presented for which new sub-routines have been written in Fortran IV to remove such restrictions. Familiarity with the use of standard Calcomp plotting procedure must be assumed.

Independent scaling. The mineralogist may wish to plot points according to a scaling of his own. For example, two separate plots may be required using say basic rocks and acid rocks on FeO–MgO diagrams. For purposes of comparison the separate graphs would be drawn to the same scale, irrespective of the fact that in the acid-rock diagram much of the field will remain empty. A new sub-routine to permit independent scaling, ADJUST, has been written; it is used in place of SCALE. In the absence of SCALE the LINE routine cannot be used: the difficulty is overcome by the use of SYMBOL in its place.

[1] A product of California Computer Products, Inc., 305 Muller, Anaheim, California 92803, U.S.A.

Multiple symbols. Using the same example of acid and basic rocks, it might have been required to plot both populations on a single FeO–MgO diagram differentiating between the points of each by appropriate symbols. Whereas the standard LINE routine permits only a single symbol to be used for all the plotted points, by means of the new sub-routine EMBLEM, used in conjunction with SYMBOL (in place of LINE), a variety of symbols may be used in a single plot.

Ternary diagrams. A new sub-routine TERNARY has been prepared whereby three arrays of data may be plotted in a single ternary diagram. Ternary diagrams may also be drawn with mixed populations appropriately labelled by EMBLEM.

   Copies of the program may be obtained from the Librarian, Department of Geology, Hebrew University, Jerusalem.

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