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ELECTRONIC ARTICLE

Real-time AFM diagrams on your Macintosh

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ABSTRACT

An algorithm is presented for the calculation of stable AFM mineral assemblages in the KFMASH system based on an internally consistent thermodynamic data set and the petrogenetic grid derived from this data set. The *P-T* stability of each divariant (three-phase) AFM assemblage is determined from the bounding KFASH, KMASH, and KFMASH reactions. Macintosh regions (enclosed areas defined by a sequence of x-y points) are created for each divariant region. The Macintosh toolbox routine "PtInRgn" (point-in-region) is used to determine whether a user-specified *P* and *T* falls within the stability limit of each assemblage, and the compositions of minerals in the stable assemblages are calculated and plotted. Implementation of the algorithm is coded in FORTRAN as a module for program Gibbs (Spear and Menard, 1989). Users can calculate individual AFM diagrams at any *P-T* condition within the limits of the *P-T* grid, and sequences of AFM diagrams along any *P-T* path. Diagrams can be saved as PICT images for creating animations. The internally consistent thermodynamic data sets of Holland and Powell (1998) and Spear and Cheney (unpublished) are supported.

The algorithm and its implementation provide a useful tool for researchers to explore the implications of a petrogenetic grid and to compare predictions of different thermodynamic data sets. Comparison of natural samples with predictions from the grid can be made if appropriate projections of the natural data into the KFMASH system are made. Results are also useful to students learning to understand petrogenetic grids and the progressive metamorphism of pelitic mineral assemblages.

* This article is designed to be read on a computer with internet access. The full text of the article can be obtained in pdf format at http://gmr.minsocam.org/Papers/v1/v1n3/v1n3abs.html.

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