

CHARTS FOR CORRELATION OF OPTICAL PROPERTIES
WITH CHEMICAL COMPOSITION OF SOME COMMON
ROCK-FORMING MINERALS*

GEORGE C. KENNEDY, *Society of Fellows, Harvard University.*

The following group of charts has been assembled from sources as noted below. The data, though the best now readily available, are in part subject to correction. Persons using these charts are requested to note any errors that come to their attention.

The feldspar curves were compiled by F. C. Calkins and modified by Hess in the region of the highly calcic plagioclases.

Curves for the high-magnesium end of the orthopyroxene diagram are after curves by H. H. Hess, published in *American Mineralogist*, **25**, 271-285 (1940). Curves for the high-iron end have been constructed by the writer from inferior data and are not of the same reliability as Hess's data. The curve for 2V is from Hess.

Curves for the diopside-hedenbergite series and for the diopside-johannsenite-hedenbergite triangular diagram are after unpublished curves drawn by Waldemar T. Schaller.

Curves for clinoenstatite-clinohypersthene-diopside-hedenbergite are taken from a diagram published by Toru Tomita in *Jour. Shanghai Sci. Inst.*, Sec. 2, **1**, 46 (1934), and modified by the writer in the diopside-hedenbergite range of the system using Schaller's data.

The olivine curves are from data obtained on synthetic minerals, by N. L. Bowen and J. F. Schairer, published in *American Journal of Science*, **29**, 197 (1935). The curve for 2V has been calculated from these data by Clyde Wahrhaftig.

Curves for the calcite group minerals are after unpublished curves constructed by Clarence S. Ross.

Data for the garnet triangular diagrams were compiled by Michael Fleischer and published in *American Mineralogist*, **22**, 751-759 (1937).

Grateful acknowledgment is due the contributors to this compilation. Professors E. S. Larsen, Jr., Clifford Frondel and Cornelius S. Hurlbut have carefully checked the diagrams and made many suggestions in their presentation.

* Contribution from the Department of Mineralogy and Petrography, Harvard University, No. 285.

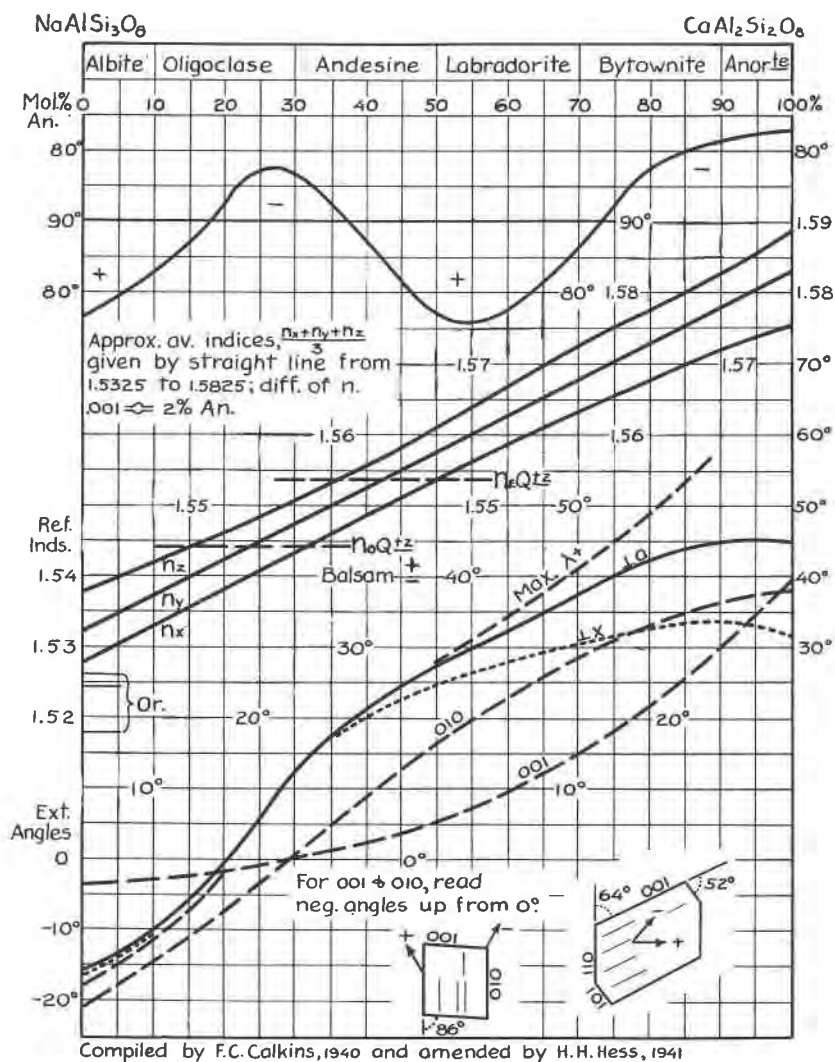


FIG. 1. Variation of optical properties with chemical composition in the plagioclase-feldspar group.

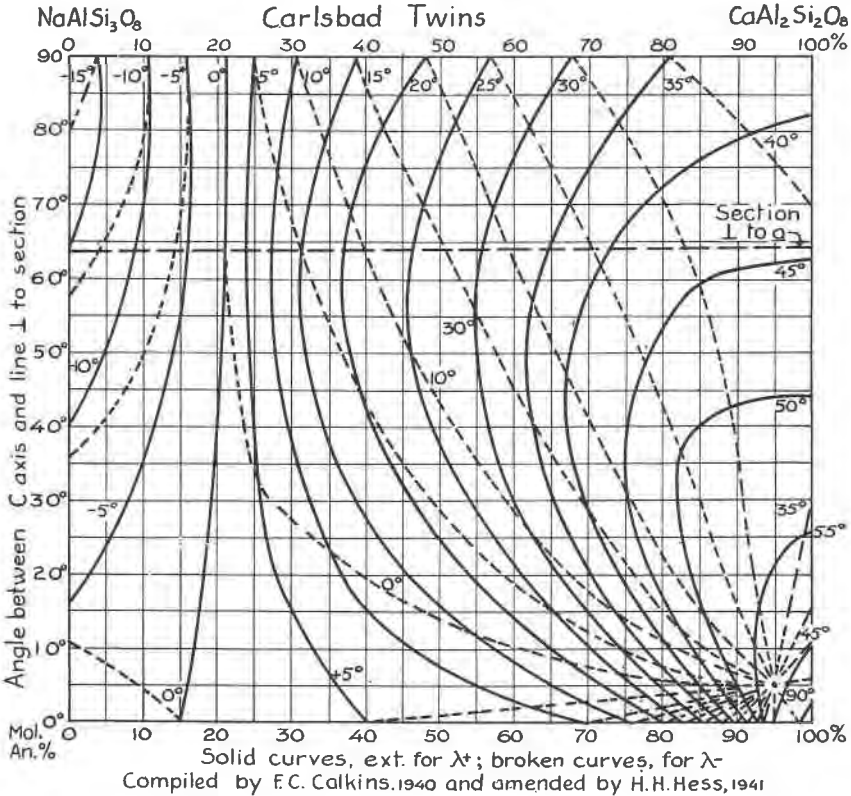


FIG. 2. Variation of optical properties with chemical composition in the plagioclase-feldspar group.

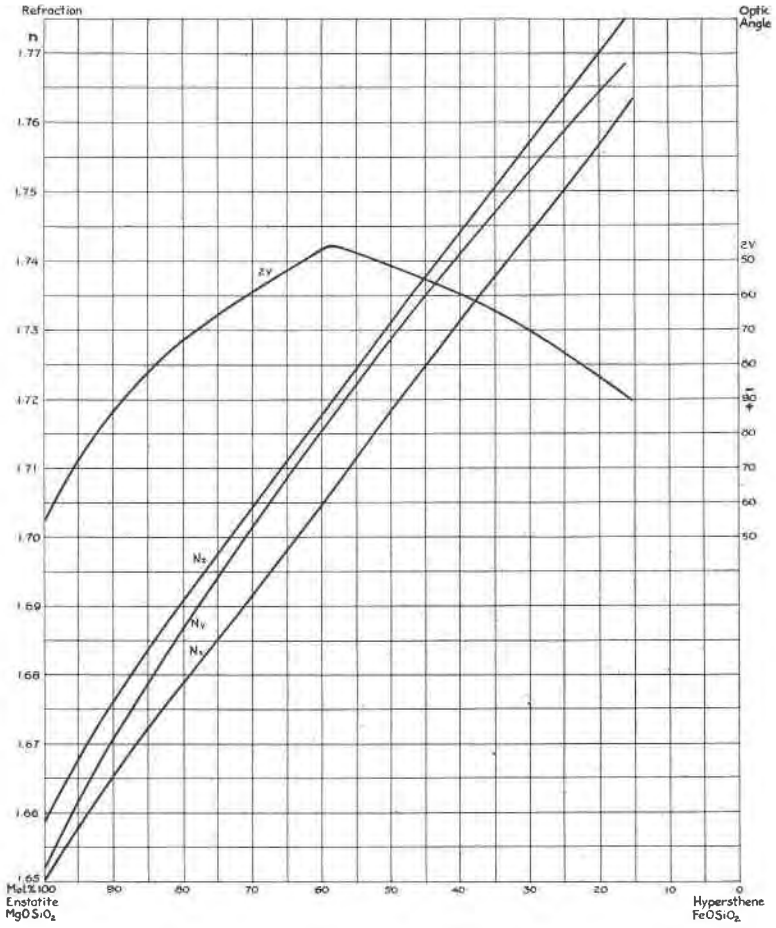


FIG. 3. Variation of optical properties with chemical composition in the enstatite-hypersthene series.

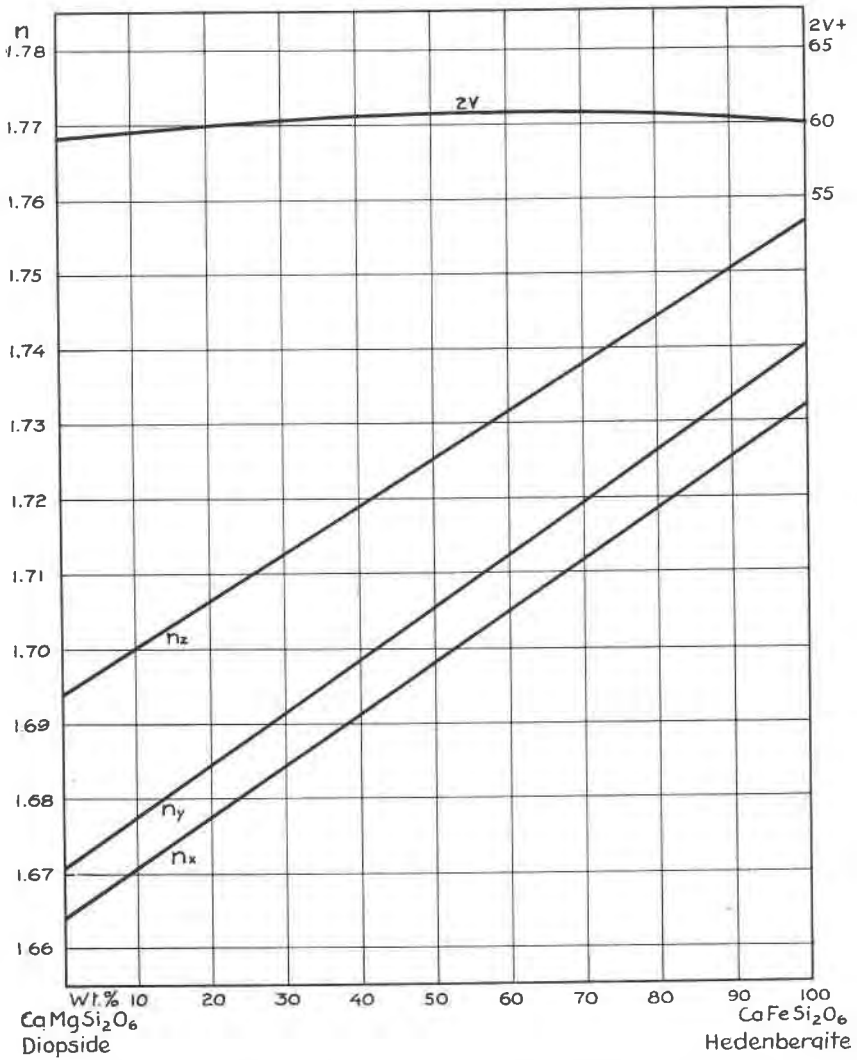


FIG. 4. Variation of optical properties with chemical composition in the diopside-hedenbergite series.

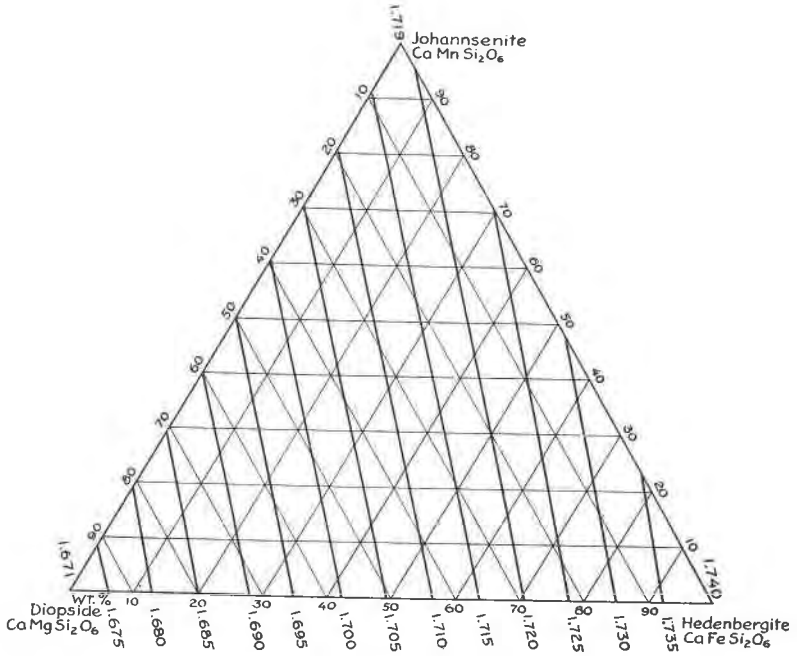


FIG. 5. Variation of N_y with composition of diopside hedenbergite-johannsenite system.

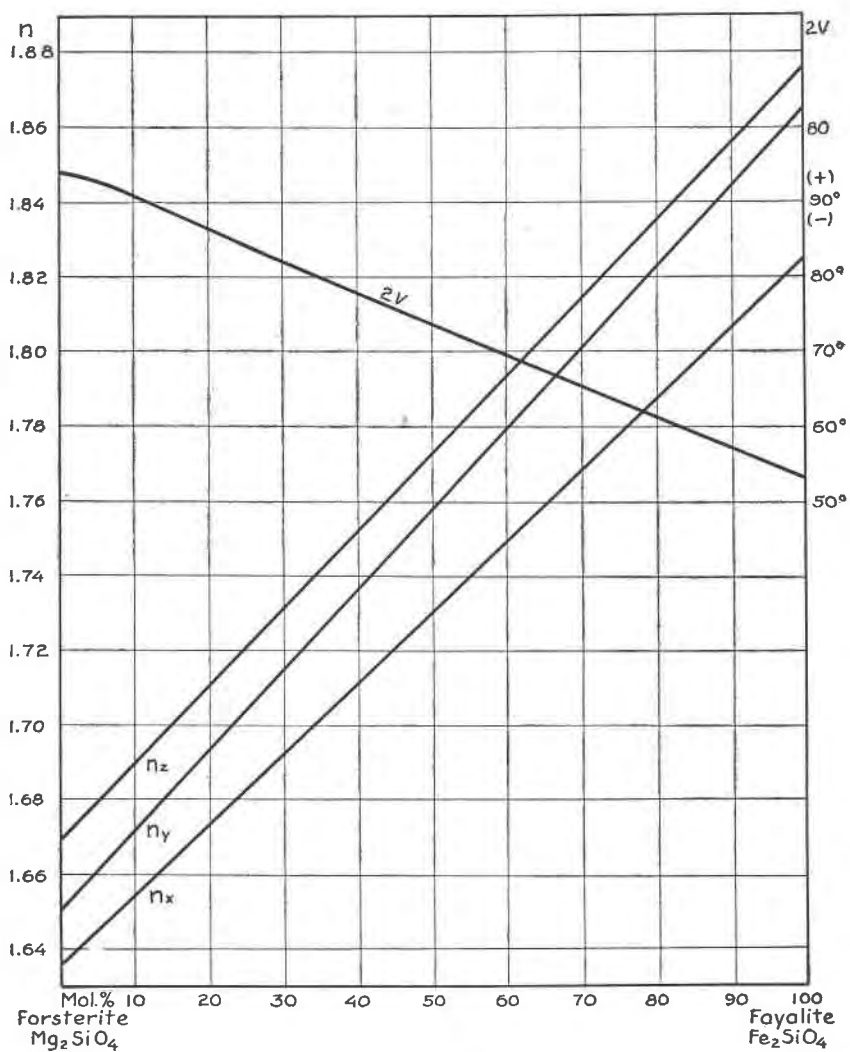


FIG. 6. Variation of optical properties with composition in the forsterite-fayalite series.

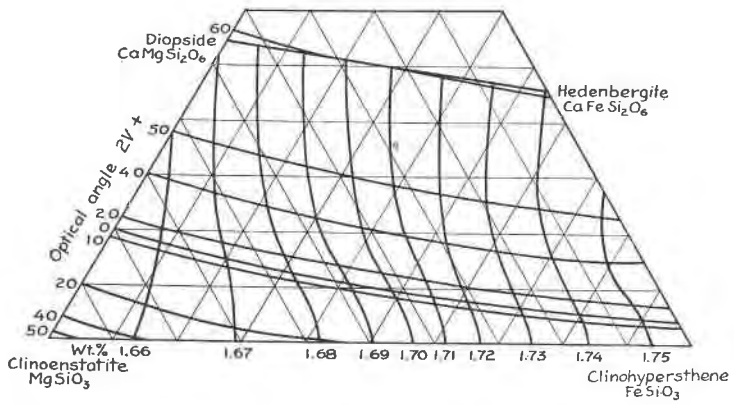


FIG. 7. Variation of N_{γ} and $2V$ with composition in the clinoenstatite-clinohypersthene-diopside-hedenbergite system.

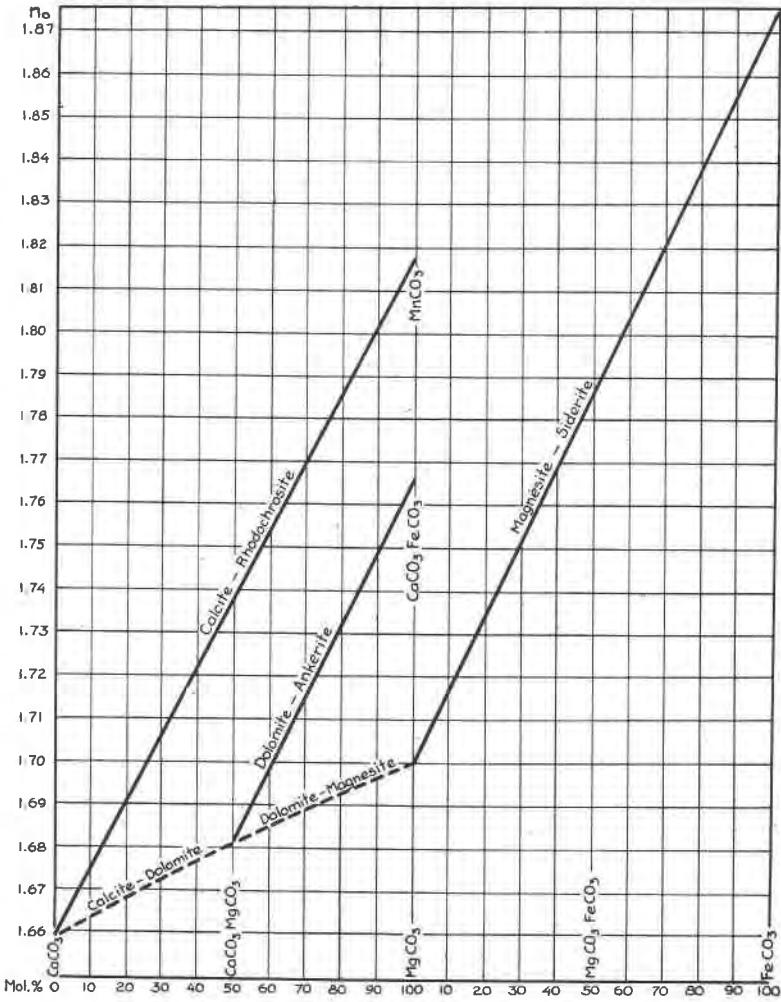


FIG. 8. Variation of N_o with composition in calcite group minerals.

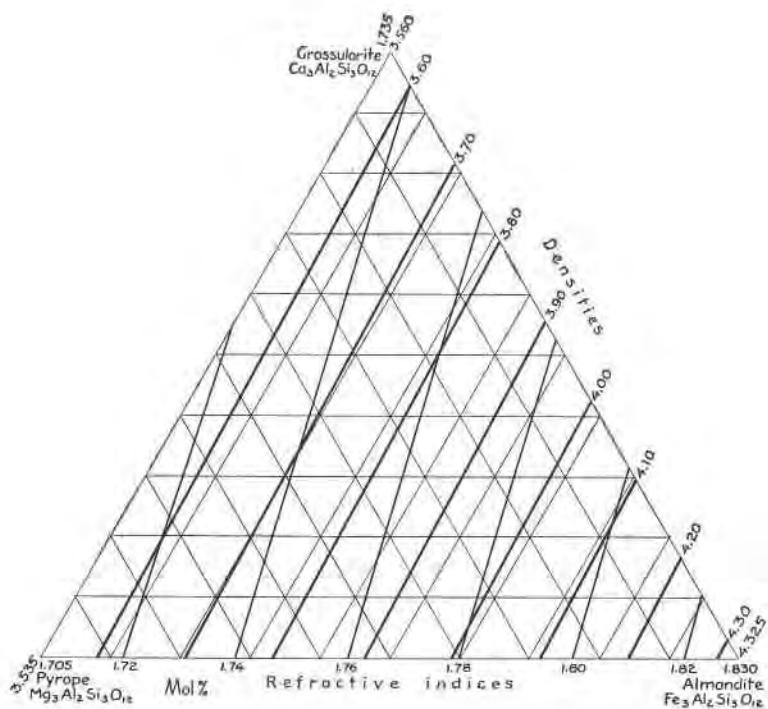
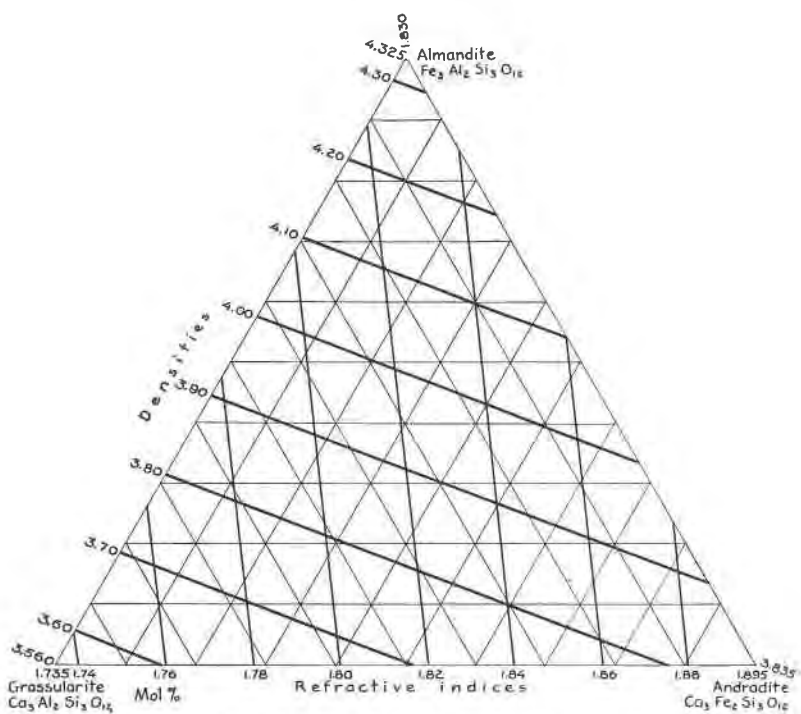
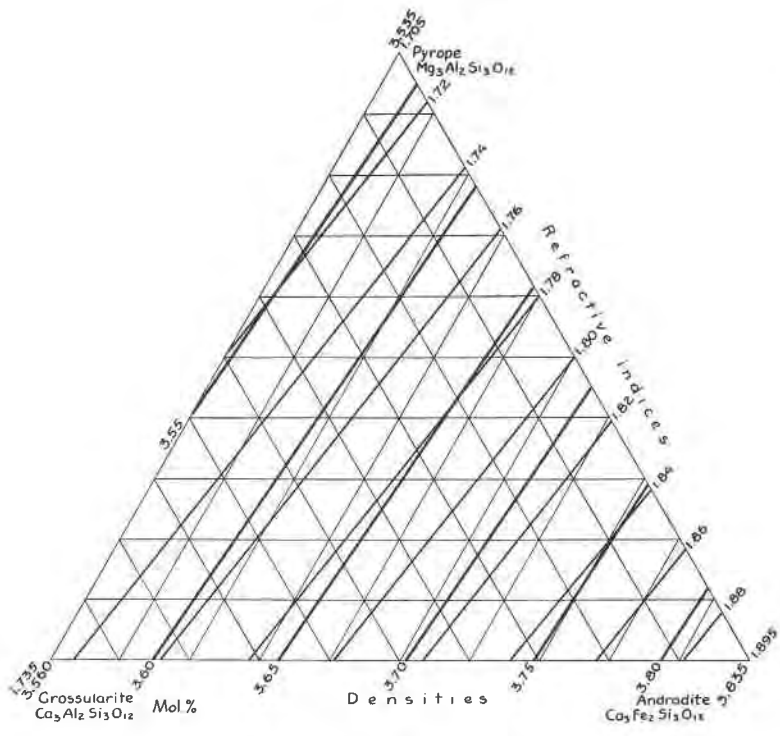


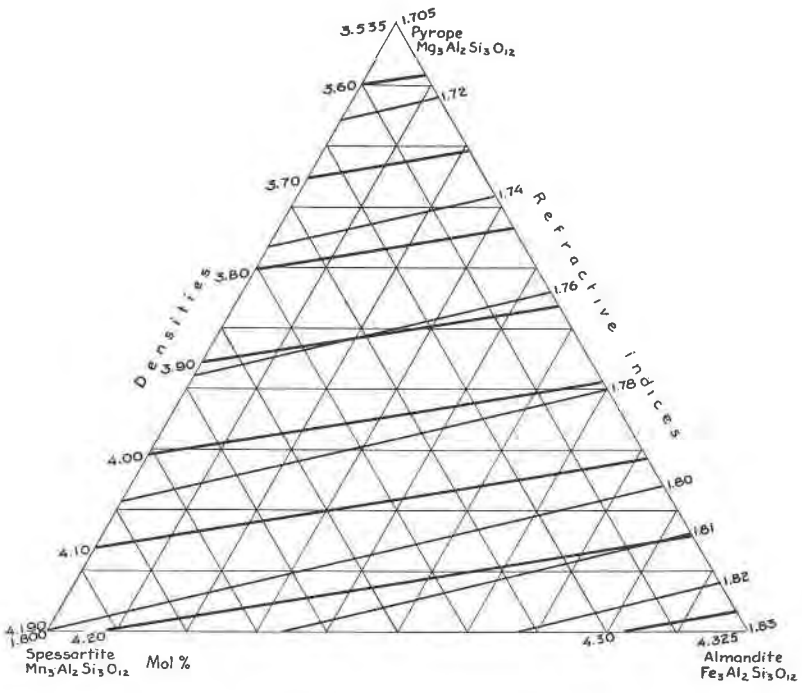
FIG. 9. Variation of physical properties with chemical composition in the garnet group minerals. a. Grossularite, pyrope, almandite.



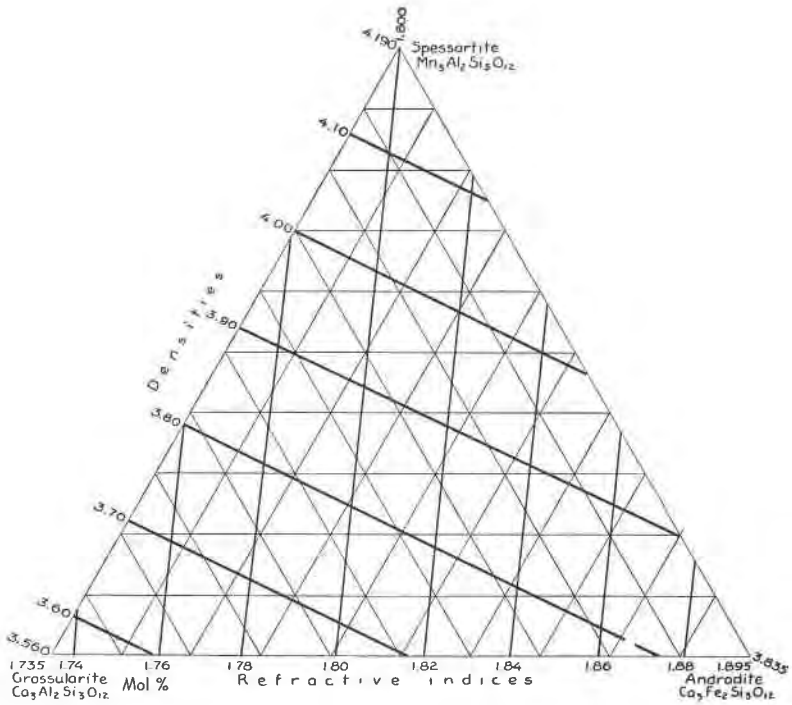
b. Almandite, grossularite, andradite.



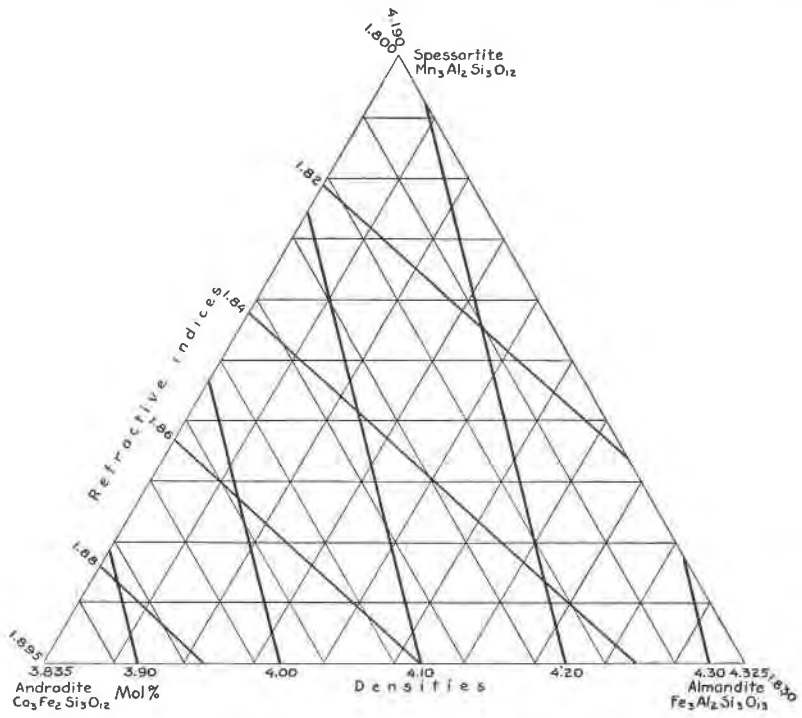
c. Pyrope, grossularite, andradite.



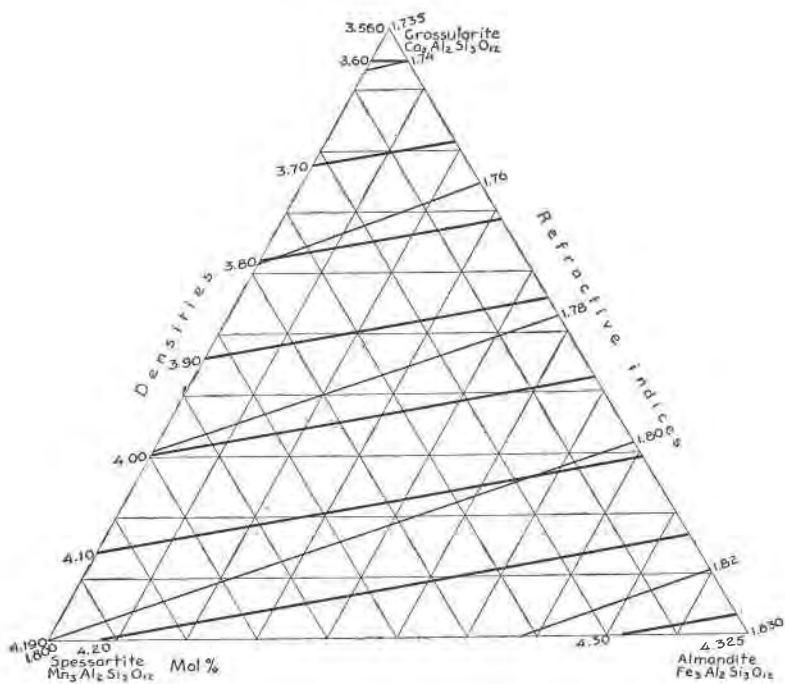
d. Pyrope, spessartite, almandite.



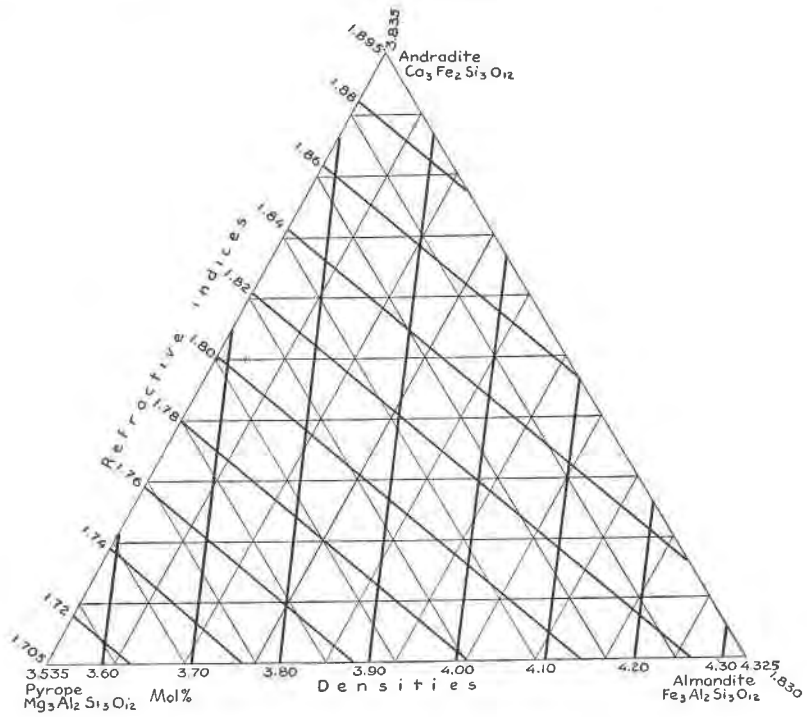
e. Spessartite, grossularite, andradite.



f. Spessartite, andradite, almandite.



g. Grossularite, spessartite, almandite.



h. Andradite, pyrope, almandite.