AN INTERGROWTH BETWEEN ALBITE AND SODALITE

K. V. SUBBARAO*
Department of Geology, Sri Venkateswara University, Tirupati, India

During the course of a detailed petrographic investigation of the Kunavaram Series—a group of alkaline rocks that occur in an area (Longitude 81°4′ and 81°18′39″, and Latitude 17°36′30″ and 17°19′39″) in the Khammam District, Andhra Pradesh, India (Subbarao, 1967), the author has observed intergrowths between albite and sodalite in a ferro-hastingsite-biotite-sodalite nepheline syenite displaying a hypautomorphic granular texture. Microcline-microperthite is abundant. The albite occurs as blebs, stringers and patches in the perthite and as rims around it. Nepheline is fresh and clear and occurs both as discrete grains and also as islands in albite. Vermicular intergrowths of nepheline and albitic plagioclase occur marginal to broad plates of albite, similar to some described by Tilley (1957) in the alkaline rocks of York river, Bancroft area, Ontario. Sodalite occurs as a rim around nepheline and also as veins along the contacts of nepheline and microcline-microperthite (Fig. 1). In places sodalite has replaced the nepheline present in the vermicular intergrowths of nepheline and albite, and owing to this, it displays a "drop" texture due to the presence of blebs of albite.

The vermicular intergrowths between albite and sodalite are found both as vermicules of albite in sodalite and, conversely, as vermicules of sodalite in albite. Vermicules of albite occur in grains of sodalite, which in turn, are enclosed by broad plates of albitic plagioclase with vermicular sodalite (Fig. 1). Also, where sodalite occurs as rims around nepheline, there are similar vermicules of albite in the sodalite and also of vermicular sodalite in adjoining grains of albite grains (Fig. 1). Furthermore, these vermicules of albite in sodalite are connected, and in optical continuity, with the adjacent albite grains.

Nepheline may be the first mineral formed since it occurs as a core mantled by sodalite, as islands and also as discrete grains. Vermicular albite and sodalite might have been simultaneously formed followed by a second generation of albite. This albite forms mantles around grains of sodalite. Vermicules of albite are closely interwoven within the sodalite.

It may be that there are two generations of feldspars as well as sodalite, since both these minerals occur as individual grains and also as vermicules in the intergrowths of sodalite and albite.

These intergrowths may be regarded as resulting from reaction in the

*Present address: Dept. of Geology, University of Manitoba, Winnipeg, Canada.

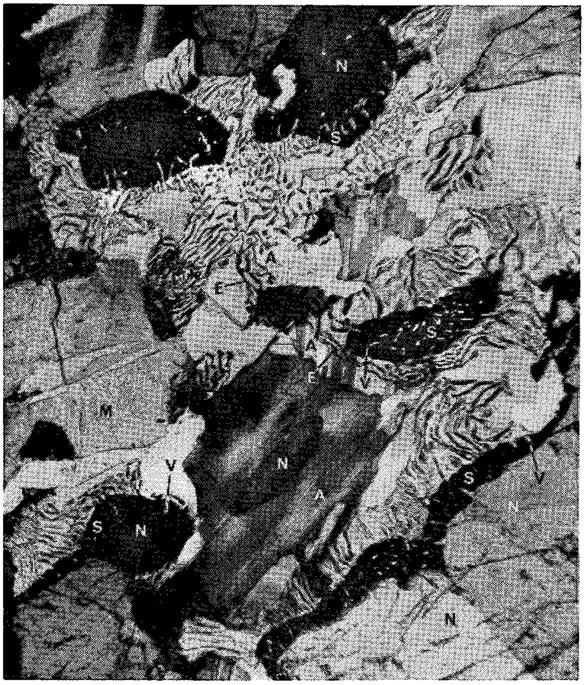

FIG. 1. Intergrowth between albite and sodalite, A = albite, V = vermicular albite, S = sodalite, E = vermicular sodalite, N = nepheline, M = microcline microperthite. Nicols crossed, ×50.

last stages of the solidification of the magma or from post-magmatic replacement. The author prefers to support the latter view for the following reasons:

1. When sodalite occurs as vermicules, albite acts as a host mineral, and it is not uncommon to find a reversible relationship between these two minerals.
2. Wherever the intergrowth exists, the guest mineral mostly cuts the boundary of the host. Sometimes blebs of albite occurring within the sodalite rims show connection with the adjoining albite grains.

Vermicular intergrowths between nepheline and feldspar, quartz and potassium feldspar, quartz and plagioclase, quartz and tourmaline, and feldspar and magnetite, are recorded by many workers. The intergrowth between nepheline and feldspar in foyaite from Hiriroa, Ribeirao do Capitao, Brazil (Johannsen, 1962, Fig. 63) has been called a myrmekite-like intergrowth. But vermicular intergrowths between albite and sodalite in the nepheline syenites of this area is noteworthy, as it has not been reported from anywhere else. This intergrowth may be the result of post-magmatic replacement.

Acknowledgments

The author expresses his thanks to Dr. K. V. Suryanarayana and Professor M. G. C. Naidu for their kind help and encouragement during the course of the present work at the Department of Geology, Sri Venkateswara University, Tirupati. He is greatly indebted to Professor C. E. Tilley of Cambridge University, and Professors R. B. Ferguson and A. C. Turnock of the University of Manitoba for their stimulating discussions and critical reading of the manuscript. Thanks are also due to Mr. R. Pryhitko for taking the photomicrograph.

References

Johannsen, A. (1962): The manual of petrography of the igneous rocks, Chicago University Press, vol. 1, p. 43.

Subbarao, K. V. (1967): "Kunavaram Series"—a group of alkaline rocks from India, *Curr. Sci.*, **36**, p. 267–268.

Tilley, C. E. (1957): Problems of alkali rock genesis, *Quart. Jour. Geol. Soc. London*, **113**, p. 323–360.

Manuscript received February 9, 1968

OPTICAL ABSORPTION STUDIES OF GROSSULAR, ANDRADITE (VAR. COLOPHONITE) AND UVAROVITE

P. G. Manning*

In this note are reported the optical absorption spectra of an andradite (var. colophonite), two grossulars and an uvarovite. The purpose of the work is the identification of the band marking electronic transitions to the second field-independent state in octahedrally-bonded Fe^{3+}, i.e., the $^6A \rightarrow {}^4E(D)$ transition in Fig. 1.

A very sharp band in andradite spectra at 22,700 cm^{-1} has earlier been assigned to transitions to the first field-independent state (Fig. 1) in Fe^{3+} (Manning, 1967; Grum-Grzhimailo *et al.*, 1963). The same band is observed in the colophonite spectrum (Fig. 2) at 22,700 cm^{-1} and also in the spectra of the two grossulars at 22,800 cm^{-1} (Figs. 3 and 4). The spectra of the

*Research Scientist, Mineral Sciences Division, Department of Energy, Mines and Resources, Ottawa, Canada.