A Study of the Feldspars from the Mica Pegmatites of Nellore.

THESE feldspars comprise different types varying in composition and mineralogical properties. The most common of these is an albite with a Na_2O content of about 10 per cent. and an orthoclase with a potash content of about 16 per cent. In addition to these two main types there are also found appreciable quantities of perthites and microperthites, the most conspicuous of these being a beautiful green moonstone composed of a perthite-microperthite. A flesh-red microcline with typical microcline structure is also present in large quantities.

A quantitative study of almost all the main types of these feldspars was carried out both chemically and microscopically. The potash member in the flesh-red specimens of perthites and microperthites was found to be microcline, while in the other specimens, it was a moonstone of an orthoclase type. In the green feldspars the potash member is always green having very fine microcline twinning. The presence of this microcline twinning led to the common and erroneous view that this feldspar was microcline. But it differs from microcline in many of the essential optical properties. Sections cut parallel to (*001*) show straight extinction with reference to the trace of (*010*) cleavage. In addition, sections cut parallel to (*010*) show almost symmetrical interference figures in convergent polarized light. These observations show that it is not microcline but a moonstone of the orthoclase type. It is not anorthoclase as its sodium content was found to be very low. The microcline structure is perhaps an anorthoclase effect produced by that portion of albite which is in solid solution in the potash member.

Results obtained from chemical and micrometric data show definitely that mutual solubility exists between the *Or* (potash member) and *Ab* members on the one hand and *Ab* and *An* members of these feldspars on the other, whereas the *Or* and *An* members are not miscible. It is also noticed that *Ab* is more soluble in *Or* than *Or* in *Ab*.

The perthitic structure and the microcline twinning of these moonstones are not destroyed by heat, but continued heating at a tempearture of about 1000° gives rise to a change in the potash member at its contact with the albite member. The sharp contact

disappears and one notices a somewhat coarse area which does not extinct simultaneously with either of the feldsapar members.

Almost all the coloured feldspars, excepting the flesh-red ones, lose their colour on heating them to 300°. The green moonstone perthite changes into a pearl-white feldspar which retains all the original properties excepting the colour.

Though almost all the perthites examined exhibit the schiller phenomenon, the colours shown by them are not real schiller colours, but are produced by a metallic impurity, probably iron, which occurs as a ferrous compound in the green feldspars, and as a ferric compound in the flesh-red feldspars. In these feldspars no correlation could be found between the nature of the microperthitic structure and the colour, but the schiller behaviour which is always white in these feldspars is due to the microperthitic structure.

The flesh-red feldspars which contain the maximum amount of iron owe their colour to the microcline portion which holds numerous ferruginous vesicles distributed throughout its mass.

The green feldspars owe their colour to a green turbidity, probably due to a ferrous silicate which occurs as green cloudy patches within the body of the feldspars. Heated specimens do not show any special areas of turbidity. It appears therefore that the loss of colour is due to a change in the state of aggregation of the iron compound present in the feldspar.

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