that may well account for the variation in the Si–O distance about the mean value 1·62 Å observed by Mozzi and Warren (1969).

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Variations in optical properties of muscovite due to 70 KEV proton irradiation

THE effect of high energy, 70 KEV, protons with a total fluence of $8{\cdot}3 \times 10^{16}$ protons per cm^2 on mica crystals was investigated as part of an initial study of solar wind bombardment of minerals.

The optical properties of the mica before irradiation were: α 1·565, β 1·603, γ 1·609, 2V 42° 36′. After irradiation α was 1·559, β 1·589, γ 1·599, and 2V 56° 4′. Since it was suspected that part of the observed differences in optical properties may have been due to mainly thermal effects related to proton bombardment (Nash, 1967), non-irradiated mica was heated to 450 °C. The optical properties of heated non-irradiated mica were similar to the original mica.

The drastic change in optical properties would indicate a significant change in the refractivity related to either a decrease in the polarizability or a dimensional change of the mica lattice.

Initial X-ray topography by means of a Lang camera before and after irradiation

revealed significant damage to the mica lattice resulting in dislocation and additional mosaic structures.

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Corrections to the system anorthite–åkermanite–diopside by means of Gibb's free energy analyses of the systems anorthite–åkermanite and anorthite–diopside

THE ternary system anorthite–åkermanite–diopside located in the petrologically significant four component system CaO–MgO–Al_2O_3–SiO_2 shows some troublesome abnormalities in the trends of the isofracts and isotherms in the anorthite primary field (de Wys and Foster, 1958). In addition an analysis of the effective molecular weights of the anorthite components in solution for the system anorthite–åkermanite (de Wys and Kapadia, 1971) compared to that of the anorthite components in solution for the system anorthite–diopside (Adams and Cohen, 1966) revealed an untenable combination of anionic group structures to exist in the primary field of anorthite. This anionic group structure conflict is also emphasized by the results of the freezing point lowering analysis of the system anorthite–åkermanite (de Wys, 1960) resulting in a van't Hoff factor of 2 for the anorthite molecule in solution. It was felt that a reanalysis of the anorthite region of the above-mentioned binary system might resolve the above-mentioned anomalies.

Thermodynamic discussion and results. Gibb's thermodynamic potentials, such as $G = H - TS$ where H represents the enthalpy and S the entropy, are very applicable for the evaluation of the liquidus curves of binary phase diagrams. The method consists of evaluating the free energy of the various liquid compositions of the phase