

of the greenschist facies (or possibly a new facies) to accommodate the rocks concerned.

(8) Extensive laboratory studies on systems related to zeolites have emphasized limitations of synthetic methods of establishing equilibrium phase relations. Change of starting materials has been shown to change apparent phase boundaries by more than 200°C even when run times exceed 30 days.

(9) The determination of phase boundaries by measurement of solubility may provide a sounder approach to the study of some silicate equilibria. Preliminary work on analcime appears promising and suggests that the analcime + quartz → albite + water transition occurs near 200°C at low pressures.

(10) The state of silica in starting materials appears critical where the phases on opposite sides of a phase boundary have different silica contents. The field of high-silica phases such as wairakite and mordenite is extended when the silica activity is higher than that of quartz. Observed effects of silica activity can be correlated with thermodynamic expectations and with natural occurrences. Similar conclusions could be drawn for other components in other systems.

(11) We consider that in quartz-bearing systems sodium and calcium zeolites are not stable above temperatures of about 320°C although they may be synthesized readily at temperatures as high as 450°C.

(12) We consider that the prehnite subfacies, transitional between the zeolite facies and greenschist facies, may come in at temperatures around 300°C ($\pm 50^\circ$) in regions where water and load pressures are approximately equal and at lower temperatures if osmotic conditions occur.

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APPENDIX I

Experimental

(A. J. E., W. S. F., A. M. T.)

A1. 1. *Apparatus*

A great number of experiments were conducted in small closed vessels of capacity 2–10 cm³. Two features of these should be noted. Firstly they are most satisfactory in the water liquid-vapour range, i.e. at small degrees of filling and temperatures below the critical temperature of water. At supercritical temperatures the density of the fluid was maintained at approximately 0.33 and pressures were calculated from the data of KENNEDY (1950b). Secondly, the initial