

changes in pH must be relative solubilities of periments designed to alinity accelerates the n in silica activity is a

s of calcite-laumontite fossils is a matter for

large quantity of water available. Thus in many cases alteration may be tion of zeolite facies same temperatures and of course, for possible erned, traces of zeoliti- ill be just as significant a rocks the assemblage ium. Nevertheless the ll less hydrous phases. dite \rightarrow laumontite are that P_{H_2O} has been ons for persistence of tic or the result of lack not those of true water of laumontite could be

O or $CaO \cdot Al_2O_3 \cdot SiO_2$ - lution at any arbitrary olite in the presence of ee tectosilicates may of three-phase zeolite ma, does not therefore ali-alumina ratios or idote or prehnite may

in petrogenetic inter- on need to be known ome cases these appear

to be clear cut, as in the conversion of analcime to pseudomorphs of albite. If calcic heulandite alters to calcic laumontite the interpretation is simple but if sodium is present its distribution between the phases will be important and this factor has not yet been examined experimentally. Similarly the experimental reaction: prehnite \rightarrow anorthite + wollastonite + vapour does not occur when prehnite breaks down in regional metamorphism and it will certainly not take place under the same P - T conditions.

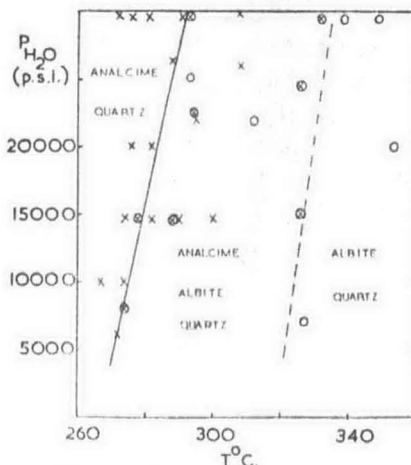


Fig. 10. Results of crystallization of oxide mixes of composition: albite + SiO_2 . The full line represents the lower limit of albite and is considered to be nearer the equilibrium boundary than the upper dashed line which represents the upper limit of analcime. Run times vary from 4 to 340 hr.

5. FIELDS OF SYNTHESIS AND STABILITY OF ZEOLITES AND RELATED PHASES (A. J. E., W. S. F.)

5.1. General

In large part this must be considered a progress report on work which has already occupied about 3 years and a revision of some previous work by one of the writers (FYFE, 1955). The present position is not one of finality; in fact it abounds in problems which are incompletely solved. Experimental data are recorded in Appendix 1.

The majority of experiments reported here involve the crystallization of glasses or oxide mixes. Gels were not used for reasons outlined below. Mixes were made mainly from calcium oxide, sodium hydroxide solution, active chromatographic alumina, and Mallinckrodt A.R. silicic acid. It became clear as work proceeded that these mixes favoured products high in silica, so in later mixes ground quartz was used with little apparent change in the times necessary for reaction. Many experiments were conducted using minerals as starting materials.

A wide range of apparent phase boundaries have been recorded for the same phase using different starting materials. Although in many cases no satisfactory conclusion can be drawn about the true equilibrium boundary, it is certain that if attainment of equilibrium is desired the worst possible starting materials are the most reactive, i.e. gels, mixes and glasses. These are so unstable that a large number