A1.4. *Experiments with glasses*

Experiments were carried out on 130 glass samples having the following compositions and refractive indices:

	Composition	*R.I.*
A	Ab + 4·25 SiO_2	1·472
B	0·8Ab + 0·2An + 4·25 SiO_2	1·484
C	0·6Ab + 0·4An + 4·25 SiO_2	1·490
D	0·4Ab + 0·6An + 4·25 SiO_2	1·502
E	0·2Ab + 0·8An + 4·25 SiO_2	1·508
F	An + 4·25 SiO_2	1·515

The lower silica content of the glasses is reflected in the lack of free silica in some end products. The crystallization was conducted at 2000 bars for 14 days in each case. Calcium-rich glasses react readily above 300°C, but with increasing soda content the tendency to crystallize falls off. The sodium glass would not crystallize in 2 weeks at 300°C even at a water pressure of 5000 bars. To obtain results from this glass, sodium fluoride was added as a flux ($\frac{1}{2}$ mole of NaF per mole of $NaAlSi_3O_8$). With calcium members NaF could not be added as insoluble calcium fluoride would form. The crystallization of the soda-rich members was erratic and it appears that small amounts of impurities may have an influence.

Pure calcium glasses did not react rapidly below 275° at 3000 bars but at 5000 bars crystallization was fairly rapid at least down to 212°C. The major results are summarized in Fig. 12. In Table 6 results at 5000 bars are summarized.

Table 6

Glass	T°C	Products
F	212	E
	450	W, An, Q
	460	An, Q
	470	An, Q
D	250	E
	335	M + E
	350	M + E

Some separate experiments (Table 7) were conducted on the crystallization of albite glass at 2000 bars. The glass (R.I. 1·488) was made by melting the very pure albite from Amelia, Virginia. Once more sodium fluoride was added to facilitate crystallization.

Table 7

T(°C)	220	240	255	270	298	310
Products	A	A	A	A	Ab	Ab

The boundary indicated is close to that of Valpy, using oxide mixes, but as found by Mackenzie (1957) a silica phase was not obtained in sufficient quantities to produce an X-ray pattern. In the presence of fluoride the significance of this observation must be treated with caution as some silica may be held in solution as SiF_6^{2-} or sodium silicate.