

between Z_3 and Z_4 , temperature below T_4 of figure 3). Therefore, with our present knowledge of the subsolidus relations of the plagioclases, we can not use the equilibrium between plagioclase and epidote as a general geological thermometer.

Mineralogisk-geologisk museum, Tøyen, May 1959.

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Crystallization experiments with alkali olivine basaltic glass from Egersund.

By

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Some dikes of alkali olivine basaltic dolerite from the Egersund area contain glass as a border zone. This glass was heated partly dry, partly under controlled water pressure. The dry heating was made in nichrome

or platinum furnaces, the heating under water pressure was made either in cold seal bombs or in a bilaterally heated hydrothermal bomb. Similar experiments have been made by H. S. YODER jr. and C. E. TILLEY (1956).

Table 1

Weight per cent	Mol norm	Weight per cent	Weight norm
SiO ₂ 45,05	Q 4,97	SiO ₂ 49,16	Or 2,78
TiO ₂ 2,83	Or 17,02	TiO ₂ 2,29	Ab 17,82
Al ₂ O ₃ 16,93	Ab 12,67	Al ₂ O ₃ 13,33	An 25,30
Fe ₂ O ₃ 1,45	An 18,50	Fe ₂ O ₃ 1,31	
FeO 11,63	C 6,38	FeO 9,71	Di 22,93
MnO 0,16		MnO 0,16	Hy 15,35
MgO 4,91	En 14,46	MgO 10,41	Ol 9,14
CaO 7,26	Fs 13,87	CaO 10,93	
Na ₂ O 1,33		Na ₂ O 2,15	Mt 2,09
K ₂ O 2,71	Mt 1,60	K ₂ O 0,51	Il 4,41
P ₂ O ₅ 2,82	Il 4,17	P ₂ O ₅ 0,16	Ap 0,34
H ₂ O ⁺ 3,51	Ap 6,34	H ₂ O ⁺ 0,04	
H ₂ O ⁻ 0,13		H ₂ O ⁻ 0,05	

Composition of 1. studied glass, anal. Christie, and 2. of glass used by YODER and TILLEY (1956).

Plagioclase formed in the glass in all the runs, and magnetite or hematite was mostly present. In some of the runs pyroxene formed a stable phase. In some of the runs quartz formed metastably.

Petrological examination of the glassy selvages showed that plagioclase

Table 2.

°C	Water pressure bars	Time	Product
650	heated in air	3 months	He + Plag + Q
850	—	1 week	He + Plag
1175	—	1 hour	He + Plag
275	790	3 months	Mag + Plag
280	410	3 months	Mag + Plag
580	1120	1 week	He + Plag + Q
600	1560	2 days	He + Plag + Q
630	450	1 day	He + Plag + tr. Pyr.
800	1380	10 minutes	Plag + Pyr + Q
1000	50	5 minutes	He + Plag + Q
1000	600	5 minutes	Melt.

Selected data from crystallization experiments with alkali olivine basaltic glass from Egersund. He: Hematite Mag: Magnetite Plag: Plagioclase Pyr: Pyroxene Q: Quartz.

clase and pyroxene had formed simultaneously under the pressure and temperature conditions existing during the intrusion of the rock. From table 2 and figure 1 it becomes apparent that the pressure-

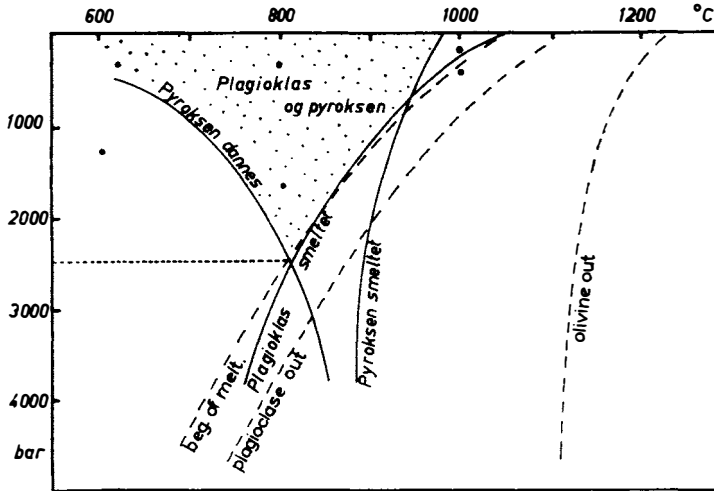


Fig. 1. Full lines, norwegian text: curves constructed from the data of table 2. Dashed lines, english text: curves from Yoder and Tilley (1956).

temperature conditions during the intrusion of the dikes correspond to the dotted area within figure 1.

Thus the temperature of the intruding melt would seem to be between 1000° and 700° C, and the water pressure to be less than 2500 bars.

Mineralogisk-geologisk museum, Tøyen, June 1959.

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H. S. YODER jr. and C. S. TILLEY: Ann. Rept. of the Dir. Geoph. Lab. Wash. 1955-56, p. 169.