Table 6. *Partial analyses of glasses prepared by melting natural garnet-bearing calc-alkaline rocks from Victoria. FeO, Fe_2O_3 determinations by chemical methods have been conducted by* E. Kiss, *A.N.U., on the natural rock powder prior to melting. Other determinations were obtained using the electron microprobe*

Specimen	2043	2044	2048	2053	2054	2056	2001
Al_2O_3	16.1	15.7	15.4	15.8	17.6	17.0	14.7
Fe_2O_3	0.3	0.8	0.5_5	0.4	0.9	0.5	1.0
FeO	3.6	3.8	3.6	2.1	3.9	3.3_5	3.5
MnO	n.d.[a]	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MgO	1.5	1.5	1.4	0.5	1.7	1.3	1.6
CaO	3.2	3.2	3.0	1.9	3.6	2.8	1.5

[a] Not detected above background using electron microprobe techniques.

near-liquidus phases in the rhyodacite II at 9 kb. Garnet is not present in either of the runs at 840° C but it does occur in the run at 820° C which shows the greatest degree of crystallization. Thus garnet is not a near-liquidus phase at 9 kb.

Two runs have been conducted at 13.5 kb. At 910° C quartz and plagioclase are the main phases, with minor mica, garnet and amphibole, while at 870° C clinopyroxene was identified as well. No reliable analyses of the garnet crystals were obtained because of the presence of abundant inclusions.

At 18 kb garnet is the near-liquidus phase in a run at 920° C, and it is joined by quartz and possibly clinopyroxene at 890° C, while at 840° C large crystals of garnet and quartz occur, together with minor blue pleochroic amphibole (glaucophane ?). At 800° C near the solidus mica, plagioclase, amphibole and quartz are present, but no garnet or clinopyroxene was identified. Microprobe analyses of the garnets were obtained.

One run on the rhyodacite II composition was conducted at 27 kb. No water was added to this run, so that the liquidus has not been lowered substantially (compared with the runs from 9—18 kb). Garnet (suitable for microprobe analysis) and quartz were the phases crystallizing at 1340° C in this run.

Analyses of garnets from these experimental runs are given in Table 8. Because of the rarity of garnet at 9 kb only one crystal could be analyzed. This proved to be very almandine rich, with minor spessartine, grossular and pyrope. At 18 kb several garnets were analyzed from runs showing different degrees of crystallization. These garnets are almandine-rich with subordinate pyrope, grossular and minor spessartine. With increasing degree of crystallization the almandine and grossular contents increase, while the pyrope content decreases. The garnet at 27 kb is similar in composition to the garnets from the runs at 18 kb showing a low degree of crystallization.

Interpretation of Results

Several results from the study of the composition and petrography of garnet phenocrysts in the Victorian calc-alkaline rocks point to their igneous crystallization origin at depth, over a limited pressure-temperature range, rather than their

mental runs on the rhyodacite II composition under wet conditions

Phases Present							Estimated % of Glass	Comments and estimat crystal phases present
mica[a]	amph		plag	qz	ga	glass	60	Rare large euhedral ga and plagioclase, anh mica ≫ ga
mica[a]	amph ?	cpx ?	plag	qz		glass	70	Common quartz, plagio tification of amphibo garnet; qz > plag, mi
	amph		plag			glass	90	Minor acicular plagioc plag > amph
mica[a]	amph ?	cpx	plag	qz	ga	glass	50	Fine grained except for uncertain identificat cpx > mica > ga, am
mica[a]	amph		plag	qz	ga	glass	70	As above except no cl phibole definitely pre
mica[a]	amph		plag	qz		glass	?	Fine grained, near-soli identified; qz > amp
	amph			qz	ga	glass	70	Common large euhedral blue amphibole prism
					ga	glass	96	Large, euhedral garnet
		cpx ?		qz	ga	glass	80	Well crystallized garn crystals of clinopyrox
					ga	glass	98	Large, clear euhedral g
						glass	100	Above liquidus
				qz	ga	glass	85	Large, inclusion-bearing qz > ga

d by X-ray means alone. [b] No water added to this sample, pyrophyllite spacer dried.