1988/25. Petrography of basalt from Brambles Quarry, Ridgley.

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Abstract

The rocks examined are all olivine basalts with labradorite, titaniferous augite, and little or no glass. Vesicles are small and uncommon, and alteration is ubiquitous but minor.

INTRODUCTION

The Brambles Company has drilled several holes near their Ridgley quarry [DQ037442] to delineate further reserves of road-building aggregate. B. D. Weldon of the Department of Mines collected several samples from these drill holes, and from stockpiles of presently-used material for comparison, to help determine the suitability of these basalt reserves for construction purposes. Sample details are shown in Table 1.

PETROGRAPHIC DESCRIPTIONS

All samples are fine-grained to medium-grained olivine basalt with minor mesostasis, and commonly some vesicles and devitrified glass. The rocks approach being holocrystalline and intergranular, and exhibit little or no preferred orientation of crystals, and very little segregation of any phases.

Olivine comprises approximately 20% by volume of the sections, is microphenocrystic to about one millimetre, as anhedral to euhedral but usually somewhat corroded crystals. Partial alteration to 'iddingsite', chlorite, serpentine and nontronite, along grain boundaries and cracks, is almost ubiquitous.

Plagioclase (labradorite) comprises approximately 50% by volume of each section, as randomly-oriented laths to 0.5 mm. It is rarely microphenocrystic.

Augite comprises about 20% by volume of the rocks, as stubby prismatic granules to 0.2 mm, interstitial to plagioclase and olivine.

Segregations of granular augite are uncommon. Most of the augite has a pale pink tint, indicating it is bordering on 'titanaugite'.

Opaque minerals comprise about 5% of the rocks, and appear to be skeletal magnetite and ilmenite. They may be up to 0.1 mm in size.

True isotropic glass was only noted in one sample (E22101) as patches up to 0.1 mm in size. This glass has a pale green colour, and is partly altered to clay minerals and zeolites. Similar pale green patches of devitrified glass were noted in most samples, particularly E200105 and E200111, where they comprise perhaps 5% by volume of the rocks.

Mesostasis is ubiquitous in this collection of rocks, and varies from about 2% to 10% by volume and about 20 to 100 micrometres in size. This material occurs as interstitial aggregates of fine-grained to very fine-grained crystals of opaque minerals, biotite, amphibole and apatite, commonly

intergrown with coarser plagioclase and augite, or with zeolite and clay minerals. It is most abundant in samples E200101, E200104-107 and E200111.

Vesicles were noted in samples E200101-103, 105 and 110-112, but are small in size and number (maximum size about 0.5 mm and <<1% by volume of the rocks). They are filled with various clay and zeolite minerals.

Alteration, as noted above, is concentrated about and within olivine grains, but is sporadic within these rocks as small veins and patches. Small patches of carbonate were noted rarely, replacing plagioclase. The degree of alteration throughout these rocks appears remarkably constant, approximately 5%. Sample E200110 is less altered than average, and samples E200105 and 111 are slightly more so.

DISCUSSION

Although there is a little variation in glass content in these basalts, it is usually minor, or at least no more abundant in samples from the drill holes than from the stockpiles. Alteration and vesicularity are relatively minor and constant.

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Table 1. *SAMPLE DETAILS*

Sample no.	Location	Approximate %		
		glass	mesostasis	alteration
E200101	BH1, 13.5 m	4	8	5
E200102	BH1, 22.0 m	1	10	5
E200103	BH3, 22.0 m	1	3	5
E200104	BH3, 28.0 m	3	10	5
E200105	BH3, 9.0 m	5	3	8
E200106	BH3, 17.5 m	0	10	5
E200107	BH3, 29.5 m	0	8	5
E200108	Stockpile A	5	5	5
E200109	Stockpile B	1	5	5
E200110	Stockpile C	2	2	2
E200111	Stockpile D	5	5	8
E200112	Stockpile E	0	5	5