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SAMPLE NUMBER: 563786 HAT-1, 91.75m

SUMMARY:

This is a less-altered and more primitive basalt than the previous sample, with subequal amount of altered olivine and fresh augite phenocrysts, and quartz xenocrysts, in a quenched groundmass.

THIN SECTION DESCRIPTION:

This is a better preserved olivine+augite-phyric basaltic lava with clear affinities to typical Hellyer basalts. It contains a few large (to 4mm long) oval vesicles filled by calcite, but consists of almost equal amounts (10-12 modal% each) of perfectly fresh euhedral clinopyroxene phenocrysts usually less than 1mm long, and larger, altered olivine phenocrysts that reach 3mm long set in a quenched groundmass. Olivine phenocrysts have been replaced in almost every case by a zoned assemblage composed of olive chlorite in the core and extremely fine-grained quartz mosaics around the outer third to two-thirds of each crystal; these are not uncommonly partially overprinted by calcite. Small chromite euhedra are not uncommon in the altered olivines. As in the previous sample, cpx grades in size from phenocrysts through microphenocrysts to stubby groundmass prisms. Also as in the previous rock, this basalt contains five or six quartz xenocrysts to a few mm across, that show pronounced reaction rims composed of very fine-grained clinopyroxene.

The groundmass of this basalt was finer-grained than that of the previous sample, and probably consisted mainly of glass charged with feathery aggregates and sheaves of quenched plagioclase and augite. Glass has altered to very fine-grained secondary quartz and intimately-intergrown dull green chlorite, with minor spotting by calcite.

As for the previous sample, this is unambiguously a Hellyer-type quite primitive basalt, that shows the same unusual quartz xenocrysts discussed under 563785. It may be a valuable exercise to test whether these rocks with quartz xenocrysts are from a single eruptive unit, or whether they are more widespread within the thick pile of Hellyer basalts. I interpret the xenocrysts to mean that basalt pumped into a magma chamber in which quartz-phyric rhyolite was sitting. The only evidence of such magma mixing, if the volume of basalt exceeded the rhyolite, would be reacted quartz phenocrysts.