

**SAMPLE: 562805**

**SUMMARY:** This rock was a hyaloclastite derived from an augite-phyric basalt. It contains a low greenschist facies alteration assemblage.

**HAND SPECIMEN:**

This rock is a grey-green lava breccia with diffuse-edged (highly altered?) clasts of dacite or andesite in a darker more chlorite-rich matrix.

**THIN SECTION DESCRIPTION:**

This sample is likely to have been a monomict glassy lava breccia or hyaloclastite composed dominantly of augite-phyric basaltic glass fragments to almost 1cm long. Many fragments were exceptionally vesicular, crystal-free glass that altered to pale brown to honey coloured sideromelane in which quite large (to 3mm) clear augite phenocrysts are set. The augite phenocrysts are euhedral and are commonly partially altered to calcite and chlorite. No plagioclase phenocrysts were present in this sample. Less vesicular glassy lava fragments do not show sideromelane alteration, but rather show heterogeneous and rather messy quartz-albite-chlorite-sericite mosaic intergrowths. In many places, these lighter coloured areas texturally resemble alteration-brecciation rather than primary volcanic brecciation, and appear to have resulted from the passage of hot fluids through the mass of glassy fragments, leaving some sideromelane areas 'unstewed'; in such areas, augite phenocrysts have been quite strongly altered to chlorite. Vesicles are filled with quartz and calcite that is riddled with sheaves of pale green actinolite needles. Veinlets of lower-temperature actinolite-free calcite cut the rock.

This was probably a basaltic hyaloclastite derived from a single flow of vesicular, augite-phyric basalt. It has suffered fairly strong hydrothermal alteration, reaching greenschist facies as indicated by the unusual presence of actinolite; temperatures of the calcite-quartz-actinolite alteration assemblage would have been around 300-350°C.