

Pegmatites - St. Kilda: an illustrated account of the geology

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Figure 14A Black pyroxene crystals, up to 6 in (150 mm) long, and opaque minerals surround a leucocratic core of albite, prehnite and epidote. Pegmatite veins at a height of 400 ft (122 m) below Claigeann an Tigh Faire

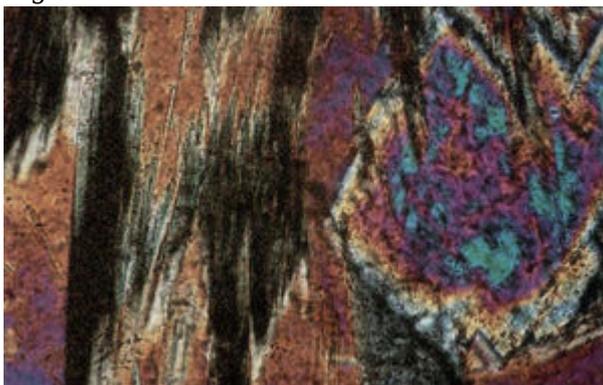


Figure 14B Rhomb-shaped cross section of epidote next to Fibrous chlorite (at extinction) intergrown with prehnite. Pegmatite from south-east end of the Cambir, (S64900), field 1 mm across, cross polarised light

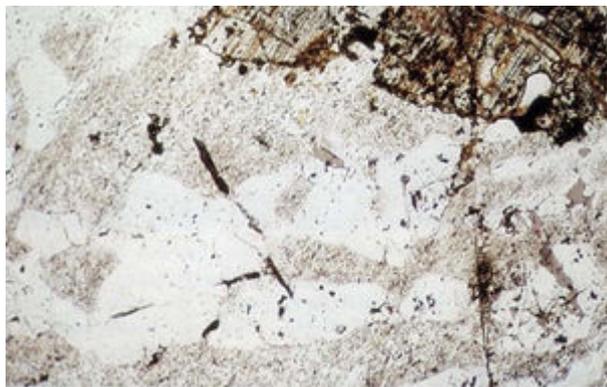


Figure 14C Pyroxene partly altered to opaques and iron-stained chlorite, long needles of apatite (colourless) and shorter acicular grains of zirkelite (brown) lie in a groundmass of turbid alkali feldspar intergrown with quartz. Pegmatite in Glen Bay Gabbro; (S65207), field 4 mm across, plane polarised light.

Chapter 8 Pegmatites

Keywords: residual fluids, mineralogy, zirkelite

Throughout the Western Gabbro a relatively coarse facies of gabbro occupies irregular fractures parallel to or transgressing the banding and layering. In some places on the eastern slopes of the Cambir, on Dun or below Mullach Bi ([Figure 14A](#)) the veins are coarsely pegmatitic with crystals of pyroxene reaching 10 inches (250 mm) in length. The smaller and thinner veins have a mineralogy comparable with that of the gabbro except that olivine is scarcer, but the coarser pegmatites are altered to varying degrees and the primary augite, labradorite-andesine and magnetite-ilmenite grains are partly replaced by chlorite (pynochlorite), epidote, albite and prehnite. The pale-coloured centres of the wider pegmatite veins consist almost entirely of these secondary minerals ([Figure 14B](#)) and here also accessory zircon is found. The composition of the augite is comparable both in major elements ($\text{En}_{42}\text{Wo}_{43}\text{Fs}_{15}$) and in TiO_2 (0.5%) and Al_2O_3 (1.6%) contents to augites in the Western Gabbro and it is likely that these pegmatites represent the residual fluids after crystallisation of most of the E^W magma. They indicate a residue rich in Na, Ca and Fe and poor in Si and K, for neither quartz nor alkali feldspar were found with the albite-chlorite-epidote-prehnite association.

In contrast the pegmatites which cut the Glen Bay Gabbro on the eastern rock shelves of Glen Bay contain a different and more extensive suite of minerals. Ferroaugite (see [Figure 5](#)), amphibole (ferroedenite), chlorite (diabantite), magnetite, ilmenite, quartz, oligoclase and orthoclase are the essential minerals with accessory biotite, epidote, allanite, sphene, apatite, zircon and zirkelite ([Figure 14C](#)). Some minerals from this suite occur in tiny patches of residual crystallisation in Glen Bay Gabbro and it is likely that the pegmatites represent, on a slightly larger scale, concentration and segregation of many of the incompatible elements (K, P, Ti, Zr, Y, rare earths) in the tholeiitic magma that could not be incorporated in the olivine, pyroxenes and feldspar of the Gabbro. The rare earth elements are largely concentrated in the allanite grains (22%) but they also occur in small quantities (7%) in the rare Zr -Y titanate, zirkelite, and in trace quantities in sphene.

Although the pegmatitic patches and veins in the gabbros of Glacan Mor, Boreray and Soay vary in composition between the two extremes described above, most contain the

albite-chlorite-epidote-prehnite assemblage and there are relatively small quantities of quartz and alkali feldspar.

References

At all times follow: [The Scottish Access Code](#) and [Code of conduct for geological field work](#)

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