SAMPLE PETROGRAPHIC REPORT

Unknown #1

Hand Specimen: 30
Thin Section: UL-11

Rock Name: Olivine gabbro

Hand Specimen Description: Medium-grained (phaneritic) dark rock largely composed of plagioclase + ferromagnesian silicate minerals.

Mineralogy:

Olivine (20%) - subequant to tabular medium-sized grains showing euhedral to subhedral outline. High birefringence and high relief. The grains are fractured and the fractures are filled with opaque minerals and serpentine.

Augite (10%) - compared to olivine, augite exhibits a lower relief and birefringence. Cleavage traces show inclined extinction. Augite typically rims the olivine and augite and plagioclase are intergrown. The augites are subhedral to anhedral in outline and exhibit irregular crystal shapes.

Hornblende (<5%) - in cross-section the hornblende shows the 120^{o} - 60^{o} cleavage typical of amphibole. The hornblende is pleochroic from colorless to orange brown. The hornblende typically occurs as a replacement of pyroxene.

Biotite (5%) - biotite occurs as individual anhedral lath-like crystals and replacing hornblende and augite. The mineral is pleochroic from colorless to orangish-red to orange, shows a high birefringence, and extinction is parallel to the cleavage traces.

Opaque Minerals (5%) - the grains are generally subhedral in outline and equant to elongate in shape. The opaque minerals occur as fracture filling in olivine and as individual grains widely dispersed through the section.

Plagioclase (55%) - subhedral to anhedral in outline. Shape varies from subequant to lath-like. Most grains show distinct zoning from labradorite cores to andesine rims.

Thin Section Description: The rock is medium-grained. Rounded to stubby olivine grains are widely dispersed and are the most abundant mafic silicate. The olivines are fractured and the fractures are filled with opaque minerals and serpentine. Small plagioclase grains occur as inclusions in the olivine. The olivines are often rimmed by augite and the augite is intergrown with plagioclase. Along the grain margins augite is often altered to a reddish-brown hornblende. Orangish-red biotite replaces augite and hornblende and is also found as separate grains showing a lath-like habit. Plagioclase is the dominant mineral in the rock, occurs in subequant to lath-like habit, and is strongly zoned from labradorite cores to andesine rims. Plagioclase occurs as inclusions in olivine and intergrown with augite, indicating that plagioclase and olivine were the first minerals to crystallize from the magma. With continued crystallization augite became the liquidus ferromagnesian silicate and co-crystallized with plagioclase. Hornblende and biotite are late stage minerals which replaced earlier ferromagnesian silicates and crystallized as interstitial phases. The opaque minerals occur as inclusions in most of the other minerals indicating that they formed throughout much of the crystallization history of the magma.