

Sample: S449; PSD6782

Location:

LS 8 at 352.0 m

Field Specimen:

A greenish-grey, fine-grained rock with a streaky appearance. Near one end of the sample there is a thin, irregular band or seam containing yellow sulphide.

Thin Section:

This was cut to include the band containing sulphide.

The thin band contains up to 50% of pyrite with lesser but varying amounts of sphalerite, galena and chalcopyrite. Minor magnetite is present throughout the rock and in the sulphide-bearing band magnetite has been partly replaced by hematite.

Most of the pyrite occurs as rather elongate crystals between 0.05 mm and 0.2 mm long and these are parallel to the general foliation of the rock. In some zones, however, there are smaller elongate pyrite grains which are also parallel to the foliation. Interrelated textures show that the pyrite was the first sulphide to crystallize and it is intergrown with non-opaque silicate which contains, or contained, small crystals of magnetite. Although some of the pyrite appears to have crystallized around magnetite very few of the pyrite crystals actually contain inclusions of magnetite. Much of the magnetite intergrown with non-opaque silicate and pyrite has been replaced by porous masses of fine-grained hematite.

In some zones of the sulphide-bearing band sphalerite has filled a few interstices between pyrite crystals and where this sphalerite is concentrated at the ends of pyrite crystals, the texture suggests that it may be intergrown with pressure shadow quartz or have crystallized in pressure shadows at the ends of the pyrite crystals.

Galena and chalcopyrite are intergrown with some quartz along the sulphide-bearing band and where these sulphides are associated with the pyrite they either fill interstices or partly enclose crystals of pyrite. Some chalcopyrite has invaded porous, partly oxidized magnetite and some chalcopyrite contains small inclusions of a sulphide which is either arsenopyrite or marcasite and is more likely to be arsenopyrite. Galena occurs mainly in interstices and is intergrown with some chalcopyrite and sphalerite.

Interrelated textures suggest that galena was the last sulphide to crystallize and most of it varies in grain size between 0.03 mm and 0.1 mm but there are a few thin films along grain boundaries and very few small fractures in pyrite.

Conclusion:

A magnetite-bearing volcanic rock contains a concentration of sulphide along one thin seam. Pyrite is the most abundant sulphide and this is associated with lesser amounts of sphalerite, galena and chalcopyrite.