

The chemistry, mineralogy, and petrology of the George Ashley Block pegmatite body

WALLACE D. KLECK^{1,*} AND EUGENE E. FOORD^{2,†}

¹23940 Basin Harbor Court, Tehachapi, California 93561, U.S.A.

²U.S. Geological Survey, Denver Federal Center, Denver, Colorado 80225, U.S.A.

ABSTRACT

The George Ashley Block (GAB) is a rockslide block located in the Pala pegmatite district of Southern California. It is layered, asymmetric, pocket containing, and peraluminous. The GAB consists of quartz (42 vol%), Na-rich plagioclase (27%), potassium feldspar (24%), muscovite (7%), Mn-rich garnet (2%), biotite (1%), and a trace of tourmaline and gahnite. It contains only small amounts of the incompatible elements that characterize differentiated pegmatite bodies. P₂O₅, MnO, and F are present in amounts of <1 wt% each; B, Be, Ce, Li, Nb, Nd, and Th are <100 ppm each.

More than 90% of the garnet grains in the GAB are zoned toward Mn-rich rims, and a symmetrical change in garnet-core composition occurs across the body. The mean X site contents for garnet (in at%) are 57% Fe, 40% Mn, 3.1% Mg, and 0.4% Ca. The Mn contents of garnet range from 30 to 55 at%; Fe contents vary inversely with Mn and range from about 66 to 43 at%.

It is concluded that the bulk chemistry yields little information about fractionation, but the garnet, muscovite, and biotite mineral chemistry is more useful. There may have been two separate injections of magma to form the GAB.