

The following chemical data are strongly suggestive of a sedimentary origin for some of the Skelton amphibolites:

(1) Rb/Sr of Sample FS-4 is 0.46; the average for shales given by Faure and Hurley (1963) is 0.50, whereas the average for basalt is 0.056 (Taylor and White, 1966).

(2) The TiO_2 content is rather low (0.58 percent) for mafic igneous rock (Evans and Leake, 1960: 356, table I, analysis 12).

(3) K_2O is greater than Na_2O , which is common in shales but rare in mafic igneous rocks.

(4) For the SiO_2 content the Mg/Fe ratio is high for a mafic igneous rock.

CONCLUSIONS

On the basis of chemical and mineralogical data presented in this paper several conclusions regarding the genesis of these rocks have been reached. In summary these are:

(1) In major-element chemistry the Mt Falconer pluton is very similar to other granite bodies mapped as Irizar Granite elsewhere in Victoria Land.

(2) The mafic dyes are considered to be genetically related to emplacement of the Mt Falconer quartz monzonite pluton. Small amounts of mafic magma are inferred to have been mobilised by hot, water-undersaturated quartz monzonite magma.

(3) Field and chemical evidence indicate that the Skelton Group amphibolites in the Mt Falconer area are para-amphibolites, i.e., of sedimentary origin.

(4) K/Rb ratios for total rocks fall on the "main trend" as defined by Shaw (1968); however, they cannot be used to unravel the complex sequence of igneous events.

(5) Strontium partition between alkali feldspar and plagioclase is not a reliable geothermometer for the Mt Falconer pluton; this is likely to be due to subsolidus redistribution of strontium.

(6) Phase relations of alkali feldspar, plagioclase, and quartz can be compared with those in the experimental system orthoclase–albite–anorthite–quartz–water. Chemical analyses of co-existing feldspars and total rocks, when compared with experimental results, indicate (a) the compositions of co-existing feldspars in the Mt Falconer pluton are comparable to those found in the experimental "granite" system; (b) the petrographically determined order of crystallisation: plagioclase, alkali feldspar (quartz) is consistent with the plots of total rock analyses in both the quartz-saturated orthoclase–albite–anorthite–water system and the albite–orthoclase–quartz–water system (7.5 weight percent anorthite).

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APPENDIX: METHODS OF CHEMICAL ANALYSIS

Wet chemical analyses of rocks and minerals reported in this paper were done at the Department of Geology, University of Calgary, and at the Institute of Sedimentary and Petroleum Geology, except for ferrous–ferric iron determinations on biotite, which were done by Technical Service Laboratories, Toronto. Silica was done by the rapid spectrophotometric method outlined by Shapiro and Brannock (1962). All other analyses were done on a Perkin Elmer Model 303 atomic absorption spectrophotometer following the methods outlined by Billings and Adams (1964).

As a check on the accuracy of the analyses, we have obtained analytical data on the new U.S. Geological Survey silicate rock standards. Our results and the averages compiled by Flanagan (1969) are listed in Table VII.