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*Dave; For your information, here
are the results of the
sulphur isotope analyses on the
samples Gregg and I collected
from Arctic Chief last year.*

Dave S.

Your file Votre référence

Our file Notre référence

1980 November 20

Mr. Gregg Morrison
Geology Department
University of Western
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Dear Gregg:

Here are the results of the sulphur isotope analyses on the Arctic Chief samples. I haven't had time to study the results in detail but a few things are fairly evident. The sulphur in the quartzite (samples 103A and 103B) appears to be biogenic. The sulphur in the marble samples (99A and 99B), however, is probably biogenic but thermally re-equilibrated at temperatures of 250 and 550°C, respectively (according to the data of Kajiwara and Krouse, 1971). These temperatures are very approximate as the analyses are really not precise enough for accurate determination. Also, if these temperatures are to be taken seriously, they suggest that temperature gradients must have been very steep locally because the two samples were collected only 10 feet apart.

It is also interesting that two of the three chalcopyrite-bornite pairs have almost identical $\Delta\delta^{34}\text{Scp-bn}$ values. These values probably represent equilibrium conditions and could probably be used for temperature calibration if there were data for the chalcopyrite-bornite pair, but I don't believe there are any. The third pair has a very large $\Delta\delta^{34}\text{Scp-bn}$ value that probably reflects disequilibrium.

Most of the individual values fall in a range of -3.24 to -6.46 except for the more obviously sedimentary sulphur and the three chalcopyrite analyses that range from 8.78 to 12.65. These latter values probably represent disequilibrium conditions in a magmatic-hydrothermal environment. How else can such high $\delta^{34}\text{S}$ values be derived?

My initial impression of the results is that they represent equilibration at relatively high temperatures (>500°C?). However, the results must be interpreted taking into consideration the geological setting of the respective samples, which you are better qualified to do.

I hope the results will be use to you; please feel free to include them in your thesis. I will be interested to get your impressions. Any thoughts regarding publication?

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WDS /mmh

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Regards,

Dave

W.D. Sinclair