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1986/85. Petrology of samples from the Lune River-Hastings silica deposit

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Abstract

Three samples from a percussion drill hole through the Lune River-Hastings silica deposit were examined petrologically. The two uppermost samples were determined to be mature quartzarenites, with variable but small amounts of ferruginous clay and other impurities. The lowermost sample exhibits a range of rock types indicating silicification of dolomites and ?dolomitic sandstones below the quartzarenite.

INTRODUCTION

Three samples of rock chips from Lune River borehole 14, a percussion drill hole through the Lune River silica deposit, were received from V. M. Threder for description. Details of the samples are given below:

<i>T.D.M. Reg. No.</i>	<i>Borehole depth (m)</i>	<i>Description</i>
C100049	15-17.5	Brown and white silica
C100050	28.5-31	Brown and white silica
C100051	36-38.5	Silica and dolomite

All samples were examined by transmitted light microscopy.

DESCRIPTIONS

C100049

Both the brown and white rock chips proved to be well sorted, fine- to medium-grained quartzarenites. The brown silica has a ferruginous argillaceous matrix, containing very fine-grained hematite, silty quartz, kaolinite and trace sericite. Some coarse aggregates of similar material were probably derived from rock and feldspar grains. The white silica is of two different types, one with a cherty matrix (and sand-sized chert grains) and the other with little or no matrix. The latter type exhibits, in part, quartz overgrowths and sutured to orthoquartzitic textures.

Trace amounts of white mica flakes, zircon and tourmaline are present. The original quartz sand was mainly sub-rounded to rounded, from coarse silt to coarse sand in size.

C100050

This sample is very similar to the above, but rare schist grains are evident.

C100051

This sample contains brown and white silica identical to the above samples, and also dolomite and chert. There is a gradation from quartzarenite with a cherty matrix to cherts with only minor quartz sand and mica. Some chert contains relict dolomite fragments, and exhibits textures compatible with

replacement of the granular dolomite. The dolomites are mainly fine to medium grained with only a trace of quartz sand, and some exhibit stylolites and patchy coarse-grained areas. Poorly sorted quartzarenite is rarely present.

DISCUSSION

The silica deposit is basically a mature quartzarenite with variable amounts of ferruginous and argillaceous impurities. Purer silica may be associated with zones of silicification.

Chert has formed at the base of the arenite, where it grades into dolomite and sandy dolomite, and other silicified arenites in the sequence may represent original carbonate-bearing horizons. Alternatively they may simply represent zones of enhanced permeability. The secondary silica was probably deposited largely by reaction of acidic groundwaters, dissolving silica from above formations and precipitating it by reaction with the alkaline dolomite below.

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