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1987/49. Heavy mineral concentrates from Safety Cove.

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Abstract

Microscopic examination of heavy mineral concentrates revealed them to be dominated by zircon, ilmenite and pyroxenes, with lesser amounts of rutile, leucoxene and other minerals. The sedimentological significance is discussed.

INTRODUCTION

Two heavy mineral concentrates, prepared from 'black sands' collected from Safety Cove, Tasman Peninsula, by B. Cox, were received for mineralogical analysis. The samples were examined by transmitted and reflected-light microscopy, and results are summarised in Table 1.

DISCUSSION

The pyrite occurs as framboidal aggregates and the siderite as sheath-like crystalline aggregates, together indicating a semi-marine reducing environment. The pyroxenes are strongly etched, suggesting somewhat acid conditions during diagenesis. These conditions suggest an organic-rich, waterlogged environment, perhaps a lagoon behind a coastal dune.

Most of the sand is moderately to well-rounded, except for the etched and authigenic grains (pyrite and siderite), and garnet (mainly angular).

The ilmenite is variably altered to leucoxene. A considerable portion appears fresh and thus the alteration is predominantly predepositional. The 'hematite' is all altered magnetite, containing some ilmenite. The zircon, tourmaline, rutile and chromite are coarse grained, well rounded, and practically unaltered.

The pyroxenes, ilmenite, magnetite and hematite are probably mainly derived from the Jurassic dolerite. The other minerals could be derived from granites further north, reworking of older sediments (e.g. local Permo-Triassic sandstones), and other sources.

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Table 1: COMPOSITION OF HEAVY MINERAL CONCENTRATES, SAFETY COVE (Approximate %)

Reg. No.	400320	400321
Ilmenite	45	35
Magnetite	5	tr
Rutile	5	5
Leucoxene	5	5
Hematite	5	10
Pyrite	5	5
Chromite	tr	tr
Zircon	10	10
Tourmaline	tr	tr
Pyroxene	10	25
Garnet	5	tr
Quartz and lithics	5	tr
Siderite	tr	5