

Geochemistry of the Volcanic Rocks in the Bransfield Strait, Antarctica

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Tectonic interpretation of the South Shetland Islands and Antarctic Peninsula suggests that the Bransfield Strait is possibly the young back-arc basin developed over the last 1.4 m.y. In the South Shetland Islands two different volcanic activities have been recognized. The Jurassic to late Tertiary one is typical island-arc volcanism due to the subduction of the Pacific Plate beneath the Antarctic Peninsula; the Quaternary one is due to back-arc spreading in the Bransfield Strait after the cessation of the subduction. In the strait volcanic islands such as Bridgeman, Penguin, and Deception islands and a number of seamounts have developed. We introduce the geochemical contrasts of the volcanic rocks in the islands.

Among the volcanic rocks of Bridgeman, Penguin, and Deception islands, prominent differences in the geochemical natures are observed. The contribution of "island-arc basalt source mantle" to "depleted MORB-source mantle" as a source material is assumed to have been much greater in generation of the volcanic magma erupted on Bridgeman Island, slightly great in case of Penguin Island, and very small in the event of Deception Island. Therefore it is likely that the geochemical contrasts can be from the compositional variation of the upper mantle by the temporal and spatial change of subduction of the Pacific Plate since Jurassic time.