



TRACE ELEMENT CHARACTERIZATION OF DECEPTION ISLAND TEPHRAS: IMPLICATIONS FOR THE ORIGIN OF MAGMAS ASSOCIATED TO RECENT VOLCANISM

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Deception Island (South Shetland Islands) is a volcanic island in a high tectonic stress setting: it is located in the border of the Antarctic Plate, but in a region of highly tectonic complexity whereas a subduction zone, a back-arc basin and 3 plate tectonics co-exist. Given such complexity in the tectonic settings, it is expected to find great variability in the magmas' geochemistry. It is also envisage that such variability could be extended to the magma mantle sources too. Given this scenario, one important question can be raised: Is the younger volcanism associated to the South Shetland arc (as the one occurring in Deception Island) directly connected to the subduction or, alternatively, related to the rifting leading to the opening of the marginal basin of the Brainsfield Strait? To address this question we measured certain major and trace elements, both being highly discriminant chemical parameters, which also allowed studying the fractionation processes acting at distinct stages of magmatic evolution and the composition and evolution of the mantle beneath Deception island.

Integrated in the CONTANTARC project, a set of 32 volcanic samples (Tephra), collected in different environmental (lake, smokers, beaches, permafrost and rivers) and geographic settings of the Deception Island were analyzed in terms of their major (X-Ray Fluorescence Spectroscopy) and trace element compositions (Inductively coupled plasma mass spectrometry).

All the samples studied can be classified as basaltic andesites with the exception of Punta Muratare's volcanics, which are trachyandesite basalts and are more enriched in incompatible elements. In the representative Masuda-Coryel plots of the Rare Earth Elements (REE) data, all the samples are light REE enriched with respect to heavy REE (where $(La/Yb)_n$ varies between 2,34 and 2,65). The main outcome from the relationship among major and trace elements through the use of spider diagrams is the significant negative anomaly in the normalized concentrations of Nb and Ta, reflecting an important role of the subduction associated chemical processes in the generation of Deception Island magmas.