

Preliminary major element data for the volcanic rocks collected in the scope of the CONTANTARC Project for Deception Island, Antarctica

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Integrated in the CONTANTARC project, a set of 32 sediment and volcanic samples, collected in different environmental (lake, smokers, beaches, permafrost and rivers) and geographic settings of the Deception Island are being studied.

With the main goal of understanding sources, fate and environmental processes based on the chemical composition of the sediments, all the 32 samples collected were separated through a 2 mm sieve. The lower 2 mm fraction was physically prepared for major and trace analysis, and presently the major elements are being quantified by X-Ray Fluorescence Spectroscopy (XRF).

Additionally, sample rock fragments were also analyzed by XRF to obtain their major element composition in order, firstly, to address the geochemical composition of the volcanics of Deception Island and, secondly, to study and understand the petrology of the corresponding magmas.

The volcanic samples studied maybe included in two distinct textural groups – the first, highly vesicular (vesicles having circular shape with ~1 mm in diameter, occupying up to 50% volume of the rock) and presenting small microphenocrysts of plagioclase, whereas the second group of lavas are massive, and totally aphyric. This is indicative of distinct types of extrusion, probably related with the magmatic volatile content.

The major element geochemistry revealed that all the volcanic rocks analyzed belong to the alkalic volcanic series (typical of the Ocean Island basalts – OIB) and, based on the Total Alkalies vs. Silica (TAS) discriminate diagram, can be classified as basaltic andesites. Only the volcanics of Punta Murature are trachyandesite basalts and are the most incompatible-element enriched samples off all ($K_2O/TiO_2 \sim 0.5$). The obtained fractionation trends indicate a major role of olivine and plagioclase in the differentiation of the magmas, but mantle heterogeneities and/or different melt degree should be invoked to explain the distinct geochemistry presented by the Punta Murature lavas, which can only be clarified with the trace element and radiogenic isotopic data.