

FOGO2014: Geochemistry of dust particles and air quality monitoring during the Fogo 2014 Eruption, Cape Verde

Carla Candeias¹, Paula F Ávila² Célia Alves³, Márcio Duarte³, Eduardo Ferreira da Silva¹, Fernando Rocha¹, Casimiro Pio³, João Cardoso³, Anedito Costa⁴, C4G Team⁵

¹ Aveiro University, Geosciences Department, GeoBioTec. Campus de Santiago, 3810-193 Aveiro – Portugal

² LNEG National Laboratory of Energy and Geology, Rua Amieira, Apartado 1089, 4466-901 S. Mamede de Infesta, Portugal

³ Aveiro University, Environment Department, CESAM. Campus de Santiago, 3810-193 Aveiro, Portugal

⁴ Meteorological and Geophysical National Institute, Monte CP 15, Mindelo, Cabo Verde

⁵ Collaboratory for Geosciences

Corresponding Author: Carla Candeias (candeias@ua.pt)

Abstract Type: Oral Presentation

Abstract:

Volcanic eruptions produce hazardous effects on the environment, climate, exposed populations health, and are associated with the deterioration of social and economic conditions. The unfavorable effects of a volcanic eruption depend on the distance, magma viscosity and gas concentrations. The hazards closer to the volcano include toxic volcanic ashes causing problems in the respiratory system, eyes and skin. These also lead to the deterioration of the water and air quality, scarcer rain events and soil contamination. During volcanic eruptions and their immediate aftermath, increased respiratory system morbidity has been observed as well as mortality among those affected by volcanic eruptions. Unfavorable health effects could be prevented by application of safety measures. Fogo island (Cape Verde archipelago), located in the Atlantic Ocean ~800 km westwards of the Senegal coast, is the fourth biggest island (476 km²) of the country. The origin of the archipelago is related to the Cape Verde hotspot magmatism, which encompasses alkaline silica-undersaturated melts of basanitic to tephritic composition. Fogo, together with Brava, are the youngest (~5 Ma) and the most active seismic islands of the country. Fogo island is an active stratovolcano with a maximum altitude of ~2,830 m above the sea level (Pico do Fogo). The last eruption occurred on November 23, 2014, after 19 years of inactivity. The lava expelled by the current eruption (still active on 2015 January 15, but declining) destroyed two villages, previously evacuated, and covered vast areas of agricultural land, causing very large economic losses. Although the eruption caused no deaths, large amounts of gases and dusts were expelled. The Collaboratory for Geosciences (C4G), a research infrastructure created in 2014 in the framework of the Portuguese Roadmap for Strategic Research Infrastructures, supported the Cape Verdean authorities by co-monitoring the eruption. The objective of this work focuses the air quality monitoring and outdoor dusts collection, that was performed by a C4G team and also by the Meteorological and Geophysical National Institute (INMG, Cape Verde). A detailed description of the monitoring efforts carried out during the eruption and the initial results of the data collected, will be presented. This monitoring effort carried out at the request and in collaboration with INMG, was made possible by an emergency financial support provided by Fundação para a Ciência e Tecnologia, Portugal.