

Petrology and geochemistry of the 2011 eruption of Nabro, Eritrea

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Nabro volcano in Eritrea is a large caldera system that forms a lineament between the Red Sea and the main Afar spreading system. The largest recorded historical eruption in Africa took place at its neighbour, Dubbi, in 1861 (Wiert and Oppenheimer, 2000). Nabro erupted in 2011, producing a trachy-basaltic lava flow that travelled 15km along the Ethiopia-Eritrea border, displacing communities and generating the largest SO₂ emission since Pinatubo (Bourassa et al., 2012). Older deposits around Nabro range from trachybasalt to rhyolite in composition, following a mildly alkaline trend with LREE-enrichment. There is a very large ignimbrite deposit, possibly associated with caldera formation, around much of the volcano, demonstrating its range of potential impacts. We present new geochemical and petrological data from the eruption, including whole-rock and mineralogical data. Preliminary results from experimental studies of the 2011 products will be discussed. These studies provide insights into tectonic processes in the Afar region and its dynamic evolution, as well as the potential hazards from future eruptions of a complex caldera system.