

The role of geochemical and petrographic properties of rocks on the rheology (viscosity) of magmatic systems: Involvement in wave spread and internal dynamics of the Earth, case of the Nyiragongo volcano field in the Virunga Volcanic Province (East African rift)

In this work, we are studying samples from lava collected following successive eruptions on the side of the Nyiragongo volcano, between 1977 and 2002, as well at the inside of the crater in 2016. First part of the work concerns the petrographic and geochemical (major and traces elements) analysis of these samples. In a second part, geochemical data are used to calculate the viscosity of these lavas. Viscosity is an important parameter influencing the effusion rate, lava flow speed and wave spread. Petrology analysis results points to foidites samples as previously mentioned in previous studies of the same volcano. The logarithmic value of viscosity, for lava's temperatures around 1000 °C to 1200°C is around 2.5 Pa.s in average for lavas collected from 2002 to 2016 eruptions, while it is 2.8 Pa.s in average for the lavas from 1977's eruption. So the viscosity from Nyiragongo's lava seams to decrease with time. The average lava flow speed of Munigi and Bitungulu vents (2002 eruptions) are respectively 6 m/s et 5 m/s.

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