P35. Basaltic explosive volcanism: magma ascent, degassing and eruptive dynamics

THE NATURE OF THE SHALLOW CONDUIT OF STROMBOLI IN THE MAJOR EXPLOSION OF 21 JANUARY 2010 REVEALED THROUGH TEXTURAL AND GEOCHEMICA CHARACTERIZATION OF BOMBS

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From May 2009 to March 2010, nine major explosions were recorded at Stromboli volcano. The major explosion of 21 January 2010 from the central crater was the characterized by a SSE-SW dispersal direction. This study focus on this bomb-dominated deposit. The quenched rings of twelves bombs was used to perform density analyses, textural and chemical analyses in order to define the mechanisms operating in the shallow conduit during this major explosion. Although density valu quenched portions are always lower than the global bombs density values, they confirm their large variations (1,1-2,3 g/cm^3). Textural data highlight a vesicularity be % and 60 %, with unimodal distributions and a main mode at 1,8 mm. Crystallinity ranges from 30-60 % and through crystal size distributions (CSDs) measurement (<100 μm), microphenocrystals (100-350 μm) and phenocrystals (>350 μm) were distinguished. The presence of a single nucleation event is consistent with a St burst dominated by a slug characterized by a single bubble nucleation event, growth, coalescence and expansion. Vesicles and crystals content variations are consi recent textural studies, which show strong textural variation in the shallow magma. This variability cause important rheological differences but not chemical contrast these samples are characterized by a strong chemical homogeneity. The matrix glasses and the melt inclusions are comparable, with 50-55 wt % SiO_2 and 0,3 CaO/Al_2O_3. The volatile content is representative of a shallow magma with a maximum of 0,5 wt % H_2O and CO_2 below the detection limit, corresponding to a depth 500 m. For this explosion, all data keep out the participation of the deep magma and only the shallow magma was involved. We suggest that the dense, degassed an rich magma forms a plug at the top of the conduit, determining the slug accumulation; when the volatile pressure is enough for breaking the plug, the explosion occur same dynamics of the normal activity. The long inactivity of the crater involved (a few days) allow the plug to mature and promote a bigger explosion.

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