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the sub-Plinian Greenish Pumice eruption (19,065±105 yr cal BP) of Mount Somma – Vesuvius. Geochemical and textural constrains.

Géraldine Zdanowicz (1,2), Georges Boudon (1), Hélène Balcone-Boissard (3), Raffaello Cioni (4), Filippo Mundula (5), Giovanni Orsi (2,5), Lucia Civetta (2,7)

(1) Institut de Physique du Globe de Paris, Sorbonne Paris Cité, Univ. Paris Diderot, CNRS, F-75005 Paris, France., (2) Dipartimento di Scienze della Terra, dell'Ambiente e delle Risorse, Università degli Studi di Napoli Federico II, Largo S. Marcellino, 80138 Napoli, Italy. , (3) Sorbonne Universités, UPMC Univ. Paris 06, CNRS, Institut des Sciences de la Terre de Paris (iSTeP), 4 place Jussieu, 75005 Paris, France., (4) Dip. to Scienze della Terra, Universita' degli Studi di Firenze, Via La Pira 4, 50121 Firenze., (5) Dipartimento di Scienze Chimiche e Geologiche. Università di Cagliari, Via Trentino51, 09127, Italy. , (6) Dipartimento di Fisica "E. R. Caianiello" Università degli Studi di Salerno, Via Giovanni Paolo II 132, 84084 Fisciano, Salerno, Italy., (7) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Palermo, Via Ugo La Malfa 153, 90146 Palermo, Italy.

Researches are currently focused on large intensity and stable eruptive columns as for Plinian event. But the large variability in deposits issued from sub-Plinian eruptions needs more observations, theoretical and experimental investigations to be better described and enhances criteria of classification and the knowledge on processes at the origin of this unsteadiness of various timescales.
Here, we focus on the well-known example of sub-Plinian eruption exhibiting by Mount Somma-Vesuvius: the Greenish Pumice eruption (GP). On the basis of coupled geochemical and textural analyses we investigate the volatile behavior (H_2O, CO_2 and halogen (F, Cl)) to better constrain (1) the magma reservoir location and pre-eruptive state and (2) the sub-Plinian eruptive style through a detailed study of the degassing processes in relation with the dynamic of the eruptive column.
Results evidence that Cl act as a geobarometer for the trachytic-phonolitic melt involved during the eruption indicating that magma reservoir was at 100 MPa (Cl buffer value: 5300 ±130 ppm) and wholly H_2O-saturated (pre-eruptive H_2O content between 3.8 and 5.2 wt%). The eruption dynamic is clearly explained by open-system degassing processes responsible of the eruptive column instability, correlated to textural heterogeneities of the eruptive products reflecting conduit heterogeneity (smaller diameter and higher horizontal gradient in magma ascent velocity).