Geophysical Research Abstracts
Vol. 16, EGU2014-14198, 2014
EGU General Assembly 2014

Mineralogical and petrological investigations of rocks cored from depths higher than 440m during the CFDDP drilling activities at the Campi Flegrei caldera (southern Italy).

Angela Mormone (1), Monica Piochi (1), Giuseppina Balassone (2), Stefano Carlino (1), Renato Somma (1), Claudia Troise (1), and Giuseppe De Natale (1)

(1) Osservatorio Vesuviano- Istituto Nazionale di Geofisica e Vulcanologia, (2) Dipartimento di Scienze della Terra, Ambiente e Risorse (DiSTAR), Università degli Studi di Napoli Federico II, Naples, Italy

The Campi Flegrei caldera is one of the highest-risk volcanic areas on the Earth and the drilling exploiting activities carried by the Azienda Geologica Italiana Petroli (AGIP) and the Società Anonima Forze Endogene Napoletane (SAFEN) since the ‘40 have produced the main constrains to the definition of the subsurface structure of the caldera.
The eastern part of the caldera represents among the least known in the area in terms of both volcanic and geothermal evolution.
Recently, in the 2012, the Campi Flegrei Deep Drilling Project (CFDDP) allowed performing a 506m hole in this sector of the caldera, i.e. in the Bagnoli Plain, where the western districts of the Neapolitan city developed.
Here, we present the preliminary results from mineralogical, geochemical and petrological investigations of drilling core samples collected at -443 m and -506 m of depths.
Scanning electron microscopy (SEM), microanalysis by energy dispersive spectroscopy (EDS) together with investigations by back-scattered electron mode (SEM-BSE), and powder X-Ray diffraction (XRD) allowed: 1) defining the primary sample lithology; 2) examining the features of both primary and secondary minerals; 3) describing the relationships among texture and secondary mineralization. Sr isotope analyses were furthermore performed on separated feldspars. Density measurements were also carried out on the bottom core.
The investigated samples are representative of strongly altered, massive pyroclastic tuffs, which made of a chaotic ashy to sandy matrix including low crystalline juvenile scoria and pumice fragments. Textural features of secondary mineralization are consistent with circulation of hydrothermal fluids as the results of a wide geothermal resource in the caldera.
Comparing the paleo-temperature inferred by authigenic minerals occurrence and the temperature measured at the bottom hole ($\sim$60°C) during geophysical logs, we suggest the cooling of the hydrothermal system in the eastern sector of the caldera.