

## **GEOCHEMICAL EXPLORATION FOR GEOTHERMAL RESOURCES AT THE SE ZONE OF GRAN CANARIA ISLAND (ATIDAMA MINING GRID), CANARY ISLANDS.**

Fatima Rodriguez<sup>1</sup>, Nemesio Perez<sup>2</sup>, Pedro Hernandez<sup>2</sup>, Raul Hidalgo<sup>3</sup>, Eleazar Padron<sup>2</sup>, Gladys Melian<sup>2</sup>, Dacil Nolasco<sup>2</sup>, German Padilla<sup>2</sup>, Jose Barrancos<sup>2</sup>, Samara Dionis<sup>1</sup>, Inigo Hernandez<sup>1</sup>, David Calvo<sup>1</sup>, Cayetano Guillen<sup>1</sup>

<sup>1</sup>Instituto Volcanologico de Canarias, Spain, <sup>2</sup>Instituto Tecnológico y de Energías Renovables, Spain, <sup>3</sup>Petratherm Hispania s.l., Spain

E-mail: fatima@iter.es

Very few efforts have been done to date in the Canary Islands to develop the potential geothermal energy resources in the archipelago. Between seventies and nineties, the Geological Survey of Spain performed intense research on geothermal resources in the country due to the oil crisis of the 70s. Later geothermal research declined sharply and only a few projects on geothermal resources were active in Spain from 1994 to 2006, compared with the many projects carried out during the previous two decades. This overall picture has changed dramatically in recent years and geothermal has become a new source of scientific research activity. In 2011 ITER, University of La Laguna, PETRATHERM Spain and the University of Barcelona started a joint research project (GEOTHERCAN), aimed to develop an experimental study of 3D models to characterize geothermal reservoirs in the subsurface of Tenerife, Gran Canaria and La Palma (Canary Islands), which enables further development of geothermal energy in the Archipelago. The multidisciplinary approach of this project, composed by different methodologies and techniques (geochemical, geophysical, and geological) allow us to address the definition of the geothermal potential in the Canary Islands under the framework of this comprehensive and ambitious project.

Under the framework of this project soil gas geochemistry studies will be carried out at different areas of La Palma, Tenerife and Gran Canaria Islands. In recent years soil gas surveys have become increasingly common in geoscientific studies. Among the objectives of these studies are the quantification of gas and heat flux from volcanic and geothermal systems and the identification and delineation of active faults. Both topics are of central importance to investigations of geothermal resources. In this abstract we are presenting the results of a geochemical survey of soil gases and volatiles that was carried out by ITER during summer 2012 in Atidama area (around 100 km<sup>2</sup>), located at the SE of Gran Canaria island. 600 sampling sites were selected to measured soil CO<sub>2</sub> efflux, <sup>222</sup>Rn and <sup>220</sup>Rn activities, Hg<sub>0</sub> and H<sub>2</sub>S concentrations and soil temperature at 40 cm depth. Soil gas samples were collected at same depth for chemical analysis (He, H<sub>2</sub>, N<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub> and Ar). Relatively low CO<sub>2</sub> efflux values were measured, ranging from non-detected up to 52.9 g m<sup>-2</sup> day<sup>-1</sup>, with an average value of 1.9 g m<sup>-2</sup> day<sup>-1</sup>. The total diffuse CO<sub>2</sub> output was estimated in 144 ± 3 t/d. Significant trends observed in the concentration of other chemical components, suggest the presence of vertical permeability structures in the studied area.