Two main structural trends were recognized, having NW-SE and NE-SW orientation from which the latter seems to be particularly active at present.

GEOCHEMICAL AND ISOTOPIC CHARACTERISTICS OF PRESENT-DAY AND PAST GEOTHERMAL SYSTEMS OF MILOS ISLAND (AEGEAN ARC)

C. Pflumio[*], L. Briqueu[**], J. Boulegue[*] and A. Liakopoulos[***]

[*] Laboratoire de Géochimie et Métallogénie, UPMC, 4 place Jussieu, 75230 Paris Cedex 05, France
[**] Laboratoire de Géochimie Isotopique, USTL, Place E. Bataillon, 34095 Montpellier Cedex 05, France
[***] IGME, 70 rue Messogion, Athens, Greece

The present-day geothermal system of Milos (Aegean arc) only develops in the eastern part of the island. It is characterized by warm springs, fumaroles and an aquifer whose termperature reaches 315°C at 1150-1200 m. The manganese oxides, Pb-Zn sulfides and barite deposits that are present in the western part are the evidence of a past hydrothermal activity. Additional concentrations of kaolinite, bentonite and barite occur throughout the island.

Oxygen and hydrogen isotopes indicate that the fluids from the deep reservoir is derived from seawater and undergoes subsurface liquid-vapor phase separation within the aquifer. The study of the chemical composition of the residual liquid and the vapor sampled at well-head allows to specify the relative affinity of several elements for each phase and discuss the importance of this phenomenon in the genesis of the mineral deposits.

The other fluids sampled on the island are derived from the mixing between seawater, meteoric water, vapor and the residual liquid. The contribution of each of these fluid end-members has been investigated using 18O/16O, 2H/1H, 87Sr/86Sr ratios and Cl and Sr concentrations. Sr isotopic compositions and concentrations, Na/K ratios point out the contribution of a rock end-member in several samples.

Sr isotopes also show that Sr in the mineralizing fluids was derived from the same source through time: the greenschist basement of the island. Lead isotopes suggest that the lead in the modern geothermal system results from the mixing of two sources, the volcanics and the metamorphic basement, whereas in the older system the contribution of a third more radiogenic component is suggested by the isotopic composition of the manganese oxides.