

## **Active and fossil geothermal systems in the continental rift zones of the Menderes Massif, Western Anatolia, Turkey**

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The tectonic position of the Eastern Mediterranean area is controlled by the Anatolian and Aegean microplates. This tectonic development results in the lifting of the Menderes Massif in Western Anatolia showing a dome structure due to compressional tectonic features from Oligocene to Miocene. From Early Miocene to Middle Miocene, the continental rift zones of the Büyük Menderes, Küçük Menderes and Gediz were formed by extensional tectonic features which strike E-W generally and are represented by a great number of thermal waters and epithermal Hg, Sb, and arsenopyrite and Au mineralizations in connection with volcanic rocks from Middle Miocene to recent in crustal origin.

The thermal waters and epithermal mineralizations are related to faults striking preferentially NW-SW and NE-SW, and located diagonal to general strike of the rift zones. The faults are generated by compressional tectonic stress attributing to deformation of uplift between two extensional rift zones.

In comparison with each other, the epithermal Hg, Sb, and Au mineralizations can be considered as fossil systems of formerly thermal waters due to various similarities with their equivalents. In connection with cooling magma chamber, Au mineralization of Küre formed at temperatures from 300 to 210 °C as a first stage. As a second stage, Sb mineralization of Emirli took place at temperatures from 260 to 180 °C. The Hg mineralization of Haliköy forms the late stage and indicate homogenization temperatures between 200 and 130 °C.