

Morphology, geochemistry and genesis of fault-related travertines in the Aran Anticline (Avaj area), Qazvin Province, NW Iran

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Abstract

Biab travertine and the Pole-Arvan travertine deposits are located in anticline Aran, north of Avaj city and in the south of Qazvin Province. One section of the Pole-Arvan travertine the forming quarry body and two sections of the Biab travertine were examined. The deposits morphologically are cascading in both regions, which is affected by faults in the region. According to the physical characteristics, four lithotypes have been identified, including laminar, coated bubbles, vegetative and dendritic. Micritic fabric with Peloidal allochems has been the most important fabric, and also dissolution and cementation are among the most important diagenetic processes in the region's travertine. Based on the results of XRD analysis, calcite in Biab region, and calcite and aragonite in the Pole-Arvan are the main minerals. It also contains small amounts of illite, chlorite, and hematite minerals, which are originated of layers of upper Miocene and Pliocene under travertine. According to the results of ICP-OES analysis, there is the highest concentration of calcium and lower amounts of magnesium, sodium, iron and strontium in travertine samples. The amount of these elements in the Pole-Arvan travertine is higher than in the Biab region and is related to the presence of cyanobacteria, the activation of the travertine springs and the deposition of aragonite. The hydrogeochemical results of this water indicate the passage of spring water through the salt layers of the region and the deposition of travertine from saline water. The water type is both Chlorocalcite, which is the result of a mixture of bicarbonate and salt water, reverse cation exchange between saline water and carbonate surrounding rocks.

Keywords: *travertine, lithotypes, hydrogeochemistry, Avaj region, Qazvin Province.*