Fluid inclusion microthermometry at the Miduk Porphyry Copper Deposit, Kerman Province, Iran

N. TAGHIPOUR[1]*AND A. AFTABI[2]

[1]School of Earth Sciences, Damghan University of Basic Sciences, Damghan, P.O. Box: 36715-364, Iran (*correspondence: taghipour@dubs.ac.ir)
[2]Department of Geology, Shahid Bahonar University of Kerman, Kerman, P.O. Box: 76135-133, Iran (aftabi@mail.uk.ac.ir)

The Miduk porphyry copper deposit is located 85 km northwest of the Sarcheshmeh porphyry copper deposit in Kerman province. The deposit is hosted by Eocene volcanic rocks of andesite-basalt composition and porphyry-type mineralization is associated with two calc-alkaline intrusive phases (P_1 and Miduk porphyry) of Miocene age. Five hypogene alteration zones at the Miduk deposit are distinguished including magnetite-rich potassic, potassic, potassic-phyllic, phyllic and propylitic. The high intensity of mineralization occurs as disseminated and stockwork in the Miduk porphyry intrusive phase. On the basis of shape and number of phases, five major fluid inclusion types have been identified in quartz crystals including multiphase brine, opaque-bearing brine, simple brine, vapor-rich and liquid-rich inclusions. Based on the petrography and crosscutting relationship, the multiphase brine inclusions (halite+ multiple opaque and transparent solid phases) are formed in the early stage of deposit with potassic alteration zone. The highest homogenization temperature and salinity (450-500°C, 50-60 wt% NaCl) are present in this type of inclusions. The final homogenization temperature and salinity of opaque-bearing brine inclusions is 400-500°C and 40-60 wt% NaCl, respectively. Boiling identified at the Miduk porphyry copper deposit by coexisting opaque-bearing brine and vapor-rich inclusions that constrained copper deposition at a temperature range of 400-500°C and pressure 200-400 bar. The final homogenization temperature of majority of brine inclusions is indicated with halite disappearance and display a positive correlation between final homogenization temperature and salinity of these inclusion types at the Miduk deposit. On the basis of stratigraphy sequences and fluid inclusion data, the emplacement depth of the Miduk deposit is about 2.5 km.

Mineralogical studies of blue vein amphibole in High Zagros salt domes (Chaharmahal and Bakhtiary Province)

S. TAGHIPOUR[1]*, B. TAGHIPOUR[2] AND M.A. MACKIZADEH[3]

[1]Department of Geology, Tehran University, Tehran, Iran (*correspondence: sedigheh.taghipour@gmail.com)
[2]Department of Earth Sciences, College of Sciences, Shiraz University, Shiraz, Iran (goharrr@yahoo.com)
[3]Department of Geology, Esfahan University, Esfahan, Iran (*ma_mackizadeh@yahoo.com)

According to the mineralogical and petrographical studies of High Zagros igneous rocks related salt deposits, they have complex mineralogical composition. The minerals assemblage in these rocks are formed in three stages, 1. Magmatic stage (plagioclase, clinopyroxcene, apatite), 2. Late magmatic stage (amphibole, biotite, quartz, albite, calcite and sphene) and 3. vein mineralization stage (quartz, albite, epidote, amphibole, calcite and garnet). In this area asbestos amphiboles are formed in cracks of basalts, diabases, tuffs and gabbroes. Based on the new amphibole classification and nomenclature, the general formula of amphibole is AB2C5T8O22(OH2). Amphibole in these rocks is actinolite in which Si=7.87-7.93, CaB>1.5,CaA<0.5, (Na+K)A<0.5. This mineral is stable in the widespread thermal (320°C -520°C) environment and 2k bar pressure.