Geophysical Research Abstracts
Vol. 14, EGU2012-1116-1, 2012
EGU General Assembly 2012

Fluid Inclusion Characteristics of Domaniç (Kütahya) Porphyry Cu-Mo Mineralization

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The study area is located at 30 km northwest of Domaniç (Kütahya) and covers on approximately 250 square kilometers. The Devonian (Paleozoic) schists which are composed of gneiss, mica schist and chlorite schist is the oldest unit of the study area. This units are overlain unconformably by the Permian Allıkaya Marbles. Eocene granodioritic intrusives cut other rock series and located as a batholite. Magmatic units present porphyric and holocrystalline textures. Granodioritic intrusions are represented by tonalite, tonalite porphyr, granodiorite, granodiorite porphyr, granite, diorite, diorite porphyries. Potassic, phyllitic and prophyllitic hydrothermal alteration zones are determined in host rocks and wallrocks. Mineralizations are observed as disseminated, and stockwork types within the granodioritic rocks. Ore minerals are pyrotine, pyrite, chalcopyrite, molybdenite, rutile, bornite, sphalerite, marcasite and limonite. Geochemically, it is of sub-alkaline affinity, belongs to the high-K, calc-alkaline series and displays features of typical I-type affinity. They show enrichment in large-ion lithophile elements (LIL) and depletion Nb and Ti indicating a subduction zone related magmatic signature for their origin. Fluid inclusion assemblages (FIAs) were measured from quartz using a Linkam THMS-600 heating/cooling stage. The inclusions contain two-phase aqueous fluids (L+V) at room temperature. All fluid inclusions belong to the H_2O- NaCl-CaCl2 system. Fluid inclusion microthermometry in the ore deposits suggest two main hydrothermal fluids, with modal homogenization temperatures and salinities (wt. % equivalent NaCl): (a) between 380.2o 140.7oC and ∼22.3 - 13.1 %, (b) 75.2o -128.7oC and between ∼10.8 - 9.2 %, respectively.