Fluid inclusions planes and anisotropy of magnetic susceptibility studies in Porto granite massif (Northern Portugal)

A. DÓRIA*, H. SANT'OVAIA, M.A. RIBEIRO AND M. ALVES

Centro de Geologia da Universidade do Porto, Depart. Geologia, Fac. Ciências, Rua do Campo Alegre, 4169-007 Porto, Portugal (*correspondence: adoria@fc.up.pt)

The three main facies of Porto granitic massif, a monzogranite, a granodiorite and a granite were characterized through a multidisciplinary methodology: petrography, Anisotropy of Magnetic Susceptibility (AMS), geometry of the Fluid Inclusion Planes (FIP) and microtermometric characterization of the fluids. These facies present similar AMS values: 53.4x10-6 SI (granite), 50.0x10-6 SI (monzogranite) and 44.3x10-6 SI (granodiorite). Magnetic foliations are organized in two groups: NNE-SSW (granite) and WNW-ESSE (granodiorite and monzogranite), both with strong dips. Magnetic lineations are organized in two main groups with SE and W azimuths and with variable dips: horizontal in granodiorites and monzogranites and strong dips in the granite. The FIP corresponding to healed microcracks in quartz are mostly intragranular and are organized in two main directions: NNE-SSW to NE-SW and NW-SE. In the granite, magnetic lineations represent a magmatic flow in the NW-SE direction according to the regional structures, suggesting that the granite emplaced in NW-SE fractures still active during the brittle deformation as is attested by the NW-SE PIF. The strong dipping magnetic lineations and foliations, suggest an emplacement within a deep structure. In the monzogranite and granodiorite the vertical magnetic foliations associated with subhorizontal magnetic lineations, suggest an emplacement controlled by a shear regime, according to the macro and microscopic structures and also confirmed by the magnetic anisotropy values (11 and 13% respectively). The fluids inclusions (FI) in the different FIP are aqueous (H_2O-NaCl system) with low salinity (<9mass% eq.NaC1). The FI in NW-SE FIP homogeneize at temperatures (Th) between 300 and 350ºC; in NE-SW FIP homogeneize at intermediate Th and in NNE-SSW FIP present the lower Th (<250°C). This FIP chronology is compatible with the late-Variscan stress field in the Iberian Peninsula. The microfractures occurred during the late-Variscan cooling of the granites during uplift. Low-salinity H_2O-NaCl fluids were the dominant fluids during this stage.

New discovery of the Ulaanbulag goldbearing massive sulphide deposit in the Bayankhongor ophiolite zone Central Mongolia

D. DORJNAMJAA[1], TS. TULGAA[2] AND TS. AMARSAIKHAN[1]

[1]Paleontological Center, Mongolian Academy of Sciences, Ulaanbaatar, Mongolia (ddorj2001@yahoo.com)
[2]"Science Elements" Co.ltd., Ulaanbaatar, Mongolia

The New Methodics

The authors worked out and applied the method of the ore-facial analysis for volcanic massive sulphide /VMS/ deposit based on petrographic, geochemical, mineralogical, geophysical researches and drilling in comparison with volcanic rocks of modern geodynamic settings.

The New Results

According to Dorjnamjaa *et al.* [1] the Ulaanbulag VMS deposit is established for the first time in Central Mongolia. The deposit is wonderfully-preserved from erosion and active denudation, and characterized by both well natural exposures and diversity of the Neoproterozoic-Cambrian volcanogenic and sedimentary rocks. During 2008 prospect holes have boring 215 metres deep and revealed ore bodies on the numerous intervals. Main ore minerals are pyrite, chalcopyrite, chalcocite and arsenopyrite. In the deposit of weathering among an oxidized ores there are cuprite, turquoise, azurite, malachite, covellite, tenorite and limonite. Content of copper in primary ore is changed, as Cu 0,31-4,4%, Au 0,11-11,9 g/t, Ag 2,8-25,73 g/t.

Conclusions

The Ulaanbulag VMS deposit was formed at the margins of the Paleoasian ocean. The studied structure corresponds to the back-arc basin, the volcanism and ore formation are developed in conditions of scattered spreading.

[1] Dorjnamjaa *et al.* (1999) *Mongolian Geoscientist* **13**, 57-58.