INSTITUTO DE INGENIEROS DE MINAS DEL PERÚ

proEXPLO2021 Bicentennial Year

VIRTUAL SEMINARS - "TOWARDS PROEXPLO 2021"

GEOCHEMISTRY APPLIED TO EXPLORATION OF MINERAL DEPOSITS

Tuesday 29 septiembre, 2021

From 6:00 pm. to 9:00 pm.

Idioma: Español (traducción simultánea)

CONTROLS ON THE FORMATION OF PORPHYRY COPPER AND GOLD DEPOSITS

Porphyry deposits are natural suppliers of most significant copper and gold to our society. Whereas the Cu-richest (Au-poor) porphyries are related to Andean-type subduction and calc-alkaline magmatism, the Au-richest porphyries are associated with high-K calc-alkaline and alkaline rocks in post-subduction or post-collision and extensional settings, and subordinately with calc-alkaline magmatism. The reasons for these associations and for the large variations in metal endowments of porphyry Cu-Au deposits remain obscure. Here, I show that porphyry Cu-Au deposits defi¬ne two distinct trends in Au-Cu space (Cu-rich and Au-rich). Metal endowments for both trends grow larger the longer the mineralization process is. However, Au is precipitated at much higher rates in Au-rich than in Cu-rich porphyry deposits. Using Monte Carlo simulations of petrologic processes, I show that, whereas Cu-rich porphyries require large amounts of magma and water to be formed, Au-rich porphyries are the result of a better efficiency of Au precipitation.

INSTRUCTOR

PhD Massimo Chiaradia

Massimo Chiaradia is Senior Lecturer at the Department of Earth Sciences of the University of Geneva (Switzerland). He obtained his MSc at the University of Padova (Italy) and a PhD at the University of Fribourg (Switzerland). His research focuses on the petrogenesis of arc magmas with implications for continental crust formation and the relationship among magma chemistry, dynamics of subduction zones and the formation of porphyry-type deposits. To carry out his research, Massimo combines fieldwork with petrologic modelling and various analytical techniques including petrography and ore microscopy, mineral and rock geochemistry, light and heavy stable isotopes, radiogenic isotopes and high-precision radiometric dating.

LITHOGEOCHEMISTRY APPLIED TO THE EXPLORATION OF COPPER PORPHYRIES

In this lecture, some procedures used to study compositional rock and soil data commonly applied during different stages of mineral exploration will be discussed. Likewise, the integration of these data with mineralogical data obtained by short-wave infrared spectroscopy will be described. The exhibition will be divided into four parts: 1) identifi¬cation of rock types, 2) identi¬fication of different types of hydrothermal alteration, 3) identifi¬cation of the presence of different types of sulfides and sulfates, 4) identi¬fication of hydrothermal cells based on the dispersion of trace elements. These stages will be illustrated with practical examples applied to the exploration of copper porphyry.

INSTRUCTOR

PhD Federico Cernuschi

With more than 15 years of international experience in the exploration/mining industry, I specialize in the geology and geochemistry of ore deposits, in particular of porphyry Cu-Mo-Au deposits and other magmatic-hydrothermal ores. I combine detailed fi¬eld mapping and core-logging using the anaconda method with whole rock and soil trace element geochemistry and short-wave infrared spectroscopy ore identifi¬cation to further infer mineralogical and geologic features that cannot be observed with a magnifying glass. I apply these techniques to the vectorization of concealed targets and geometallurgy of known deposits, by compiling and analyzing the data in hand-made maps, cross-sections and 3D leapfrog models. Petrography, mineral chemistry and age dating complement the offered services. My regular clients include First Quantum Minerals, Fortescue, CSA Global, and Rio Tinto.

INVERSIÓN

CATEGORIAS	TARIFAS
No Asociado	USD 70.00
Asociado Activo IIMP	USD 50.00
Docente / Estudiante - Pre Grado	USD 30.00
Paquete corporativo (de 3 participantes a más)	USD 60.00

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