Geophysical Research Abstracts, Vol. 9, 08385, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08385


# The Udokan-Chiney ore-magmatic system in the Northtransbaikalia, Siberia, Russia

(1) B.Gongalskiy, N.Krivolutskaya(2)

(1) Institute of Ore Deposits RAS kgrt-61@narod.ru

(2) Vernadsky Institute of Geochemistry RAS, Moscow, Russia (nakriv@mail.ru) Fax 7 495 9382054

**Introduction.** The North Transbaikalia is a unique ore region containing extra large deposits of different metals and genetic types concentrated within very small area (1500 $km^2$**).** They are **the** Katugin rare elements metasomatic deposit, the Sulumat ferriginous quartzite deposit, the Golevskoe synnyrite deposit etc. Especially copper deposits of different scale represent the most importance: the unique Udokan deposit of copper sandstones and a lot of satellite deposits of this type around it (the Sakinsky, the Pravoingamakitsky, the Unkur etc.) and so the Chiney copper magmatic deposit with noble metals and extra large reserves of Fe-Ti-V ores. They were all formed during Early Proterozoic epoch which was very productive in terms of Cu. But up to now the relationships and origin of numerous deposits and ore manifestations are not yet established. A question about genetic relations between different types of copper deposits is not very important for theory, but for practice. It helps finding new perspective ore objects.

**Geological background.** For the first time magmatic, hydrothermal and sedimentary copper ores in the North Transbaikalia are regarded as different parts of common the Udokan-Chiney ore-magmatic system. Many kilometers of country-rock displacements along the deep faults exposed to heterogeneous components of this system that allowed to study these different fragments.

On the modern surface the Udokan deposit of copper sandstones is eposed within transaction zone of two cycle structures (Kemenskaya and Ingamakitskaya) fixed by geophysical data and results of interpretation It is situated in the central part of the region. It is framed by the cropping outs of the gabbroides of the Chiney, the Mylove,

the Luktur massifs. Inside the intermediate zone (between the Udokan sedimentary and the Chiney magmatic deposits), numerous ore manifestations and deposits having signs of the both genetic types are situated. They are located in izometric antickynes structures/ Firstly, the Pravoingamakitsky, the Unkur and the Sakinsky deposits belong to this group. All these deposits have very close chemical (Cu, Ag, Au) and mineralogical (bornite-chalcocite and chalcopyrite) composition.the Main Dyke of Udokan and small bodies with copper (especially chalcopyrite) of sulfide ores, enriched in noble metals. Inside the intermediate zone (between the Udokan sedimentary and the Chiney magmatic deposits), numerous ore manifestations and deposits having signs of the both genetic types are situated.

**Results.**The authors have studied geological structure, mineralogical and chemical composition of copper ores of different genetic types. The Udokan and the Chiney deposits are characterized here briefly because they had been discribed.The main attention will be paid to, where such features of typical hydrothermal origin are found at the first time.

The Udokan deposit is located in the same-named overturned syncline (fig.1), 8 x 12 km, stretched along west-north-west direction. Ore horizon is of 350 m thickness and consists of disseminated and massive bornite-chalcocite bodies shaped in bands and lens among sandstones. All mineralogical types of ores have copper composition with Ag admixture (0.8 ppm). Parallel with the concordant position there are echelon-like small chalcocite-bornite and chalcopyrite lens and veins perpendicular to sedimantary rock stratification (fig.4). High Au concentrations have been discovered: in intersecting veinlets – up to 0.3 ppm, in subconformable veins – up to 0.1 ppm and in ore-free sandstones – 0.03 ppm.

The main components of the Udokano-Chiney ore-magmatic system are mafic-ultramafic rocks of the chiney complex, including the Chiney, the Luktur and the Mylove massifs and subvolcanic rocks.

The Chiney massif contains copper deposits: the Contaktovoe, the Skvoznoe, the Rudnoe located inside the contact zone of massif with surrounding terrigenous rocks.

The most part of satellite deposits of the Udokan located in the sedimentary rocks differ from this extra large deposit by essentially chalcopyrite ore composition and high Ag concentrations.

The Pravoingamakitsky deposit is one of the examples of hydrothermal type of deposits in the the Udokan-Chiney ore-magmatic system. There were found veins and breccia bodies with thickness up to 3 m and longitude with 5-7 m on the area of 2 $km^2$. They consist of pyrite-chalcopyrite ores which cement quarts fractions and sandstones.

The limp of ore comprises of up to 370 ppm Ag, 1.2 - Au, 0.8 - Pd, 0.2 - Pt ppm.

**Conclusions.** Sulfide ores located in different heteroabyssal blocks of lithosphere represent parts of a common ore-magmatic system. They are a result of fractional crystallization of basic-ultrabasic melts. There were consecutively formed the following types: magmatic ores in inner parts of layered intrusions, magmato-hydrothermal ores in exocontacts of massifs, hydrothermal and hydrothermal-sedimentary ones in sandstones. Hydrothermal fluids played very important role in the origin of copper ores in the Kodaro-Udokan region. Copper precipitated from fluids in submarine conditions in the Udokan deposit. This observation is not in contrast with the sedimantary genesis of the deposit.