Geogical significations of Qiatekaer Cu-Ni-Sulfide mineralized occurrence in West Kangguer ductile shear belt, Jueluotage area, Eastern Tianshan, Northwest China

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Geology and geophysics of the Qiatekaer occurrence

The Qiatekaer Cu-Ni occurrence is located in the east section of Kangguer deductile shear belt, eastern section of Jueluotag tectonic belt, Eastern Tianshan, Xinjiang, China. which have the same geological setting as the Cu- Ni deposits in the east part. The mafic dyke out crops in Qiatekaer area was found sulfides such as pyrite and pentlandite, and Ni concentration of some mineralized gabbros reach more than 400ppm, and Cu-Ni mineralized abnormalities are obviously indentified by geophysical methods such as gravity, magnetism and CSAMT [1].

Discussion

Geological characters indicate that Qiatekaer area has large potential to form Cu-Ni deposits, and there are obvious Cu-Ni sulfide mineralization judged by geochemical and geophysical characters[2, 3]. The identification of Qiatekaer Cu-Ni sulfide mineralized occurrences gives good direction to further explorer Cu-Ni deposits along the Kangguer deductile shear belt, which extends more than 500 kilometers.

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Microanalysis of trace element in Fe oxide and sulphides using LA ICP-MS and EMPA

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Our aims are to investingate the trace element concentrations and distributions in natural Fe oxides and sulfides using LA ICP-MS combined with EMPA,which are predominantly important in the study of ore genesis, economic geology of ore deposit.

In our study we analysed 267 individual magnetite and 139 pyrite in 48 samples using a GeoLas 193 nm excimer laser ablation system coupled to a Varian 820-MS series ICP-MS, and conducted elemental maps on 12 magnetite grains and sulphides grains on a Jeol JXA8200 super-probe at the Advanced Analytical Center (AAC) at James Cook University. The laser system parameters are :repetition rate:10 Hz, laser beam energy: 8J/cm^2, analysis time: 65 (30s measurement of background (laser off) and 35s analysis signal), external standard: NIST SRM 610, 612 and Mass -1, the internal standard: Fe.

EMPA trace element maps indicate that magnetite is not zoned with respect to trace element distribution, so we can use analysis limited spot on magnetite to represent the whole concentration of individual grain. The typical detection limits for a 45 micron spot are Li (1.62 ppm), Na (518ppm), Mg (0.58 ppm), Al (0.93 ppm), Si (80 ppm), K (1.41 ppm), Ca (18.39 ppm), Ti (0.17 ppm), V (0.03 ppm), Cr (1.13 ppm), Mn (0.29 ppm), Fe (5.73 ppm), Co (0.03 ppm), Ni (0.89 ppm), Cu (0.28 ppm), Zn(0.96 ppm), Ga (0.55 ppm)), Ge (0.82 ppm), As (0.17ppm), Mo (0.03 ppm), Ag (0.01 ppm), In (0.08 ppm), Sn (0.11 ppm), Sb (0.03 ppm), Ba (0.29 ppm), W (0.005 ppm), Au (0.004 ppm), Pb (0.01 ppm), Bi (0.003 ppm), Th (0.001 ppm)

The results suggests that LA ICP-MS combined with EMPA is a effective and powerful tools to investigate the trace element concentration and distribution in Fe oxides and sulphides.