



Comparison of Oceanic and Continental Ultramafic Hosted Hydrothermal Sulfide Deposits under Slow-spreading Mid-ocean Ridge Setting

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Recently, slow-spreading mid-ocean ridges have attracted lots of researchers, especially in the MAR (Mid-Atlantic Ridge) and the Indian Ocean Ridge. People have found many hydrothermal vents or hydrothermal sulfide deposits around MAR, such as TAG, Rainbow and Lost City. The slow-spreading ridges are characterized by variations in magmatic, tectonic, and alteration processes along ridge segments. Because of the difficulties of the seafloor exploration, we need an example on the continent for compare with the hydrothermal sulfide deposits on mid-ocean ridge. So we found De'erni Cu (Co) ore deposit on the north of Tibet.

De'erni Cu (Co) ore deposit is a typical VHMS developing in the north of Tibet, China. The ore body is hosted by the ultramafic rocks of the A'nyemagen ophiolite suite, which is the symbol of the residual crust of Paleo-Tethys Ocean. Through the detailed geological analysis to De'erni Cu (Co) ore deposit, lots of reminded geological records of submarine hydrothermal system, including: 1) thin-layer exhalative rock covering on the ore body; 2) the colloform structure, raspberry-like structure and breccia structure reserved in the porous-type ores; 3) the main mineral composition; 4) the calcite and felsic cement in the synchronization with the pyrite clast; 4) the ore zonality similar to the TAG hydrothermal sulfide deposit. According to the TiO_2 content in the MORB basalts, the approximate half-spreading rate is 1.1-2.5cm/a, of the Paleo-Tethys Ocean represented by the De'erni ophiolite. Comparing to the mineralization processes of present mid-ocean hydrothermal sulfide deposits, we insist that De'erni Cu (Co) deposit has experienced three stages: submarine exhalation stage, cooling deposition and subduction emplacement. And the OCC (Oceanic Core Complex) may be the host setting of the submarine hydrothermal exhalation stage. Compared to other similar sulfide deposits on the continent in the world, De'erni Cu (Co) sulfide deposit has a younger age (340Ma Carboniferous) and a more completed ore deposit structure. De'erni Cu (Co) ore deposit is a typical case of ultramafic hosted hydrothermal sulfide deposits.