Yaxar YALKUN, XUE Chunji, ZHAO Xiaobo, DING Zhenxin, CHEN Yinghui and DAI Zhijie, 2014. Geology of the Hardaban Zn-Pb Deposit in Xinjiang, NW China, and Its Comparison with the Tekeli Zn-Pb Deposit, Kazakhstan. *Acta Geologica Sinica* (English Edition), 88(supp. 2): 229-230.

# Geology of the Hardaban Zn-Pb Deposit in Xinjiang, NW China, and Its Comparison with the Tekeli Zn-Pb Deposit, Kazakhstan

Yaxar YALKUN, XUE Chunji, ZHAO Xiaobo, DING Zhenxin, CHEN Yinghui and DAI Zhijie

*State Key Laboratory of Geological Processes and Mineral Resources, School of Earth and Resources, China University of Geosciences, Beijing 100083, China*

## 1 Introduction

The Kazakhstan-Yili plate, is one of the major continental constituents the Central Asian Orogenic Belt, which is a Precambrian land mass located in Devonian-Carboniferous Residual ocean basin E-W trending ore-forming subzone across Kazakhstan and northern Xinjiang in NW China. It rifted of the northern Kazakhstan-Yili plate during Proterozoic; large-scale convection and circulation of basin fluid causing a series of important Sedex Zn-Pb mineralization, e.g., the Tekeli Zn-Pb deposits in Kazakhstan. But no typical examples have been identified in the Xinjiang, NW China. The new-found Hardaban deposit is located in Precambrian strata of northern Xinjiang, of which shows many similarities with Tekeli and has a huge potential for a large Sedex type mineral deposit. In this study, we provide a review of geology at Hardaban, and its comparision with the Tekeli deposit, in attempt to shed some light on the Sedex Pb-Zn prospecting in Xinjiang.

## 2 Geology of the Hardaban Pb-Zn Deposit

The Hardaban lead-zinc deposit is located in Wenquan County, Xinjiang Province, NW China, and it was discovered by Xinjiang Non-ferrous Exploration Institute of Geology and Mineral Resources during the year of 2005-2006. The tectonic area of the Hardaban deposit is located in the northwestern margin of the Kazakhstan-Yili plate, which is sandwiched between Siberia and Tarim cratons in west Tianshan Mountains (Cheng et al. 2012).

The strata in the deposit area are divided into a lower serious of clastic rocks, a middle combination of clastic-bearing carbonate and an upper serious of clastic rocks. Tectonically, the Hardaban deposit is located within the Sailimu micro-block which is a part of the Kazakhstan-Junggar plate. Late period of the Early Proterozoic and the Middle Hercynian intrusive rocks which mostly distributed EW-trending are exposed along the structural lineament in the region. The acidic intrusive bodies are formed mostly as large batholiths; conversely, alkaline intrusive stocks are rather small and rarely exposed.

Nearly twenty mineralized outcrops have been discovered along the ore district, and most of them trend east-westwards. Attitude of the orebodies are similar to the host rocks of northeastwards. The orebodies are characterized by cloddy and disseminated structures. The automorphic, hypidiomorphic and xenomorphic granular textures are the main ore textures, and stripped, brecciaous, veinlet-disseminated and massive structures are the main ore structure. The ores consist of more than 25 kinds of minerals, such as limonite, galena, sphalerite, chalcopyrite, pyrite, quartz, malachite, smithsonite, and dolomite.

## 3 Comparisons of Geology and Mineralization between Hardaban and Tekeli

In accordance with stratigraphic analysis, the Pre-Cambrian basement was formed under shallow-water conditions in a marginal palaeo-basin of $PR_{1-2}$ age, the platform cover was formed as a regressive sequence in an epicontinental basin of R-V age; volcanic-sedimentary complexes in depressions, graben-shaped and riftogenic structures, of the continental slope were formed in connection with continental rifting of V-Є and $O_{1-2}$ age.

As a conclusion, compared with the Tekeli lead-zinc deposit of Kazakhstan (Table 1), the output environment, the age of mineralization, geological characteristics and ore quality characteristics are very much alike, such as recognition for its genetic type is sedimentation reformation type (stratabound type).Presumably, the

* Corresponding author. E-mail: 13811443042@163.com

**Table 1 Characteristic contrast between Hardaban and Tekeli lead-zinc deposits (adapted from Cheng et al.2013)**

| Ore deposit | | Hardaban deposit | Tekeli deposit |
|---|---|---|---|
| Country | | China | Kazakhstan |
| Age of formation | | Mesoproterozoic | Riphean to Middle Ordovician |
| Mineralization background | | Kazakhstan–northern Yili paleo-continent passive margin | |
| Ore rock | | carbon-contained aplitic limestone, dolomite, carbon-contained micrite, carbon-contained slate of Haerdaban group | carbonaceous-siliceous-calcareous shale, carbonaceous-batt with limestone-dolomite of Tekeli group |
| Intrusive rock | | mafic dikes of middle-late Variscan | basic, acid rock bed, dike of upper-middle Variscan |
| Wall rock alteration | | silicification, dolomitization, sericitization, chloritization | silicification, dolomitization, pyritization sericitization, chloritization |
| Ore characteristics | | stratiform-like, lensoid structure | lensoid structure, possess the same occurrence as wall rock |
| Orebody characteristics | ore mineral | sphalerite, galena, pyrite | pyrite, sphalerite, galena, |
| | gangue mineral | calcite, dolomite, sericite | quartz, calcite, dolomite, sericite, |
| | structure of ores | veinlets, disseminated, massive | dense block, veinlets-disseminated |
| | Lead and zinc content ratio | <<I:1~1:4 | 1:2 |

Tekeli lead-zinc metallogenic belt extending into the Sailimu micro-block from east, distributed along the Hardaban group.

## References

Cheng Yong, et al. Discovery of Haerdaban Stratabound Lead-Zinc Deposit and Its Prospecting Significance，Wenquan，Xinjiang. Northwestern Geology, 2012, 281(3):116-122.