Comparison of Luobusha and Xigaze Chromite Mineralization from the Yarlung-Zangbo Ophiolite Belt

XIANGKUN ZHU, YUWEI SHE, YUAN HE, JIAN SUN, JIANXIONG MA AND HONGQING WAN

MLR Key Laboratory of Isotope Geology, Institute of Geology, Chinese Academy of Geological Sciences, Beijing 100037, China (xiangkun@cags.ac.cn)

Podiform chromitites are characteristically occurred in the mantle sequences of ophiolites. However, the metallogenic processes for podiform chromitites are still unclear. Although great progresses have been made towards understanding the genesis of podiform chromitites, some fundamental issues remain unanswered. For examples, what are the major controls on the size of chromitites? And why some ophiolites contain large podiform chromitite bodies, whereas most ophiolitic massifs are essentially chromitite-barren?

The Yarlung-Zangbo Ophiolite belt is one of the most famous ophiolite zone in the world. It contains fresh peridotites as well as different-sided podiform chromitites. The Luobusha ophiolite in the eastern segment of the belt hosts the largest chromite deposit in China. In the central and western segments of belt, the Dazhuqu and Dongbo ophiolitic massifs contain some small-sized chromitite mineralisation. Such characteristics make the Yarlung-Zangbo Ophiolites an ideal object to investigate the major controls on the metallogenesis of podiform chromitites.

In order to understand what are the main controlls for the sizes of chromite mineralisation, investigations including field geology, petrophy-petrology and geochemistry have been carried out, and systematic differences have been mapped out. In short, the Luobusha chromitites deposit crystallized from a Cr-rich melt in a dynamic conduit, where fractional crystallization and crystal settling from migrating melts play a key role in the formation of the large chromitites. In contrast, the small-sized mineralizations of the Dongbo and Dazhuqu chromitite pods are formed from locally produced melts. Podiform chromitites can be formed in MOR environment, whereas the higher Cr content in boninitic melt and assimilation of subducted slab materials at SSZ setting may benefit the formation of large chromite deposit.