1 Introduction

The Elashan area of Qinghai Province, as an important copper metallogenic belt in China, lies in the southeast Qaidam Basin. Part of the deposits in this area locate on the top or the ridge of the Indosinian intrusive bodies, another part are controlled by the Triassic volcanic stratum, which seems that the metallogenic time, space and genesis of the ore deposits are related closely to Indosinian igneous rocks. So in this paper we study the genesis relationship between the ore deposits’ mineral sources and the Indosinian igneous rocks through analyzing the rock-mineral isotopic composition.

2 Geological Setting

The Elashan area, located in the connecting and translating geotectonic setting between the Eastern Kunlun orogenic belt and Western Qinling orogenic belt, occurred two major minerogenetic serieses. One was porphyry minerogenetic series related to the hypabyssal intrusive rock, such as Jiadanggen Cu-Mo deposit, Saishitang Cu deposit, Shiduolong Pb-Zn deposit, Suolagou Cu deposit and Elashankou Pb-Zn-Ag deposit; Another was exhalative sedimentary deposit series, such as Tongyugou Cu deposit and Suolagou Cu deposit.

The Indosinian magmatic rocks of the Elashan area is an important ore-controlling factor in the spatial distribution of the areal deposits and ore occurrences. The orientation of the areal deposits and ore occurrences’ distribution is NNW, consistent with the distribution of the areal faults and rock mass. The Saishitang Cu deposit controlled by the EW structure at the border of west Qinling and Kuhai-Saishitang ophiolitic melange, is a contact metasomatic skarn type deposit related to intermediate quartz diorite. The Jiadanggen Cu-Mo deposit and Shiduulong Pb-Zn deposit locate in the NW Elashan tectono-magmatic arc which is controlled by the NW Wahongshan-Wenquan regional fault. The type of the two deposits are respectively porphyry Cu-Mo deposit and skarn Pb-Zn deposit related to intermediate-acid granodiorite which distributed in the Southeast of the Elashan granodiorite mass.

3 Characteristics of Isotopic Composition

The $\delta^{34}$S of skarn type deposits related to intermediate-acid magmatic rocks in the Elashan area are
nearly zero (the Saishitang Cu deposit) and positive (the Shiduolong Pb-Zn deposit), showing the characteristic of deep magmatic sulfur which is obviously different to the positive value of sedimentary strata (the Tongyugou Cu deposit and the Rilonggou Sn polymetallic deposit) (Fig 1). Further the rare-earth element patterns of some ores in the Shiduolong Pb-Zn deposit are consistent with the magmatic rocks'. So the intermediate, intermediate-acid magmatic rocks directly provide mineral sources for the porphyry deposit and skarn deposit. The Pb isotope composition of ores in the mines of the Saishitang Cu deposit and Shiduolong Pb-Zn deposit mainly focus in magmatism at the tectonic setting of the subduction, a little locate in the orogeny (Fig 2), which provide another evidence for the magmatic source.

Acknowledgements

Grateful to the help of Copper Mining Company of Saishitang in the field survey.

References


