1 Geologic characteristic

Located in the southern of Erlian-Hegen mountain belt, Bilugangan is a newly discovered Mo deposit of large scale in the center section of Inner Mongolia. Molybdenum mineralization occurs within the Indosinian granite stock or along its contact zone with Permian strata, consisting of veins, veinlets. The exposed stratigraphic unit is the upper Permian part of the Linxi group which mainly composed of dacite, sandstone, crystallinoelastic tuff et al. Magmatic activity occurred in the center district with northeast direction (Fig.1). The Indosinian magmatic units include granite, granite-porphyry. The texture of the ore-bearing granite is porphyritic-like. The typical major constituents of granite are present that phenocrystal: feldspar (~25vol.%), plagioclase (~20vol.%), feldspar (~20vol.%), quartz (~30vol.%), biotite (~5vol.%). There are 3 rich molybdenum ore section in the mining area, the molybdenum mineralization occurs in the granite and hornstone.

2 Major and Trace Elements of the Indosinian Granite

Bilugangan intrusive rocks are high potassic calc-alkaline series, with high SiO₂ (73.35 ~76.89), rich in alkali and aluminum, K₂O/Na₂O between 1.06 ~1.11, Mg# (50.10 ~86.71) (Fig.2). The REE elements of the intrusive rocks exhibit a low amount of total rare earth elements (REE) and weak negative Eu anomaly (Fig.3.a), with obvious differentiation between light rare earth elements and heavy rare earth elements, the ratio of LREE/HREE is 6.38 ~12.38, the ratio of LaN/YbN is 6.82 ~18.11. (Fig.3.b).

3 Re-Os Isotopic Age

Re-Os dating of 5 molybdenite samples collected from * Corresponding author. E-mail: yurengna@163.com
the main ore body shows that the model age is (238 ±239.4) Ma and the isochron ages is 237.6Ma±4.6Ma (MSWD=0.116), the mineralization age is later than its host granite (Fig.4). The Re contents of molybdenite are indicating that w (Re) :58.6 × 10⁻⁶ ~140.6 × 10⁻⁶, w (¹⁸⁷Re) :36.81 × 10⁻⁶ ~ 88.39 × 10⁻⁶, w (¹⁸⁷Os) :158.0 × 10⁻⁹ ~351.2 × 10⁻⁹, they were mainly derived from crust – mantle mixed, the Mo deposit was driven by the syn-collisional setting.

4 Discussion and Conclusions

Thus Bilugangan molybdenum deposit is formed at the early Indosinian period and related to the tectonic - magmatic activities. In consideration of other isotopic age data from the molybdenum deposits in adjacent areas, it can be inferred that magmatism- mineralization of the molybdenum deposit exist more stage in the Erlian Haote- Xilin Haote area, the metallogenic time centralized in the Indosinian and Yanshan period. The Re contents of molybdenite are indicating that they were mainly derived from crust – mantle mixed, the Mo deposit was driven by the syn-collisional setting.

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