1 Introduction

The Yaochong Mo deposit in Xinxian County, Henan Province, China, is a medium porphyry Mo deposit formed in Early Cretaceous in the Da bie Shan orogenic belt. The molybdenum deposits occur along the tectonic lineament of nearly east-west trend and are mostly concentrated in a zone stretching from the Lingshan area of Xinyang in Henan Province to the Shapinggou area of Jinzhai in western Anhui province (Li et al., 2004, 2005; Luo et al., 2010; Li et al., 2011). There are a total of more than 10 large to intermediate molybdenum polymetallic ore deposits in the belt, such as the Shapinggou, Tangjiaping, Dayinjian, Yaochong, Qian’echong, Xiaofan, Mushan, Doupo and Tianmugou deposits. The Yaochong Mo deposit was firstly discovered in 2008 by Henan Non-ferrous Metals Geological Exploration Institute, with a proven reserve of 480,000 tons of Mo metal with an average grade of 0.062%. Mo mineralization is associated with the Yaochong granite porphyry, mainly presenting as numerous veinlets in the altered wallrocks, with potassic, phyllic, argillic and propylitic alteration developed. The hydrothermal ore-forming process can be divided into the early, middle and late stage, characterized by mineral assemblages of quartz + potassic feldspar ± pyrite ± magnetite, quartz ± potassic feldspar + molybdenite ± other sulfides and quartz + carbonate + fluorite, respectively. As a new discovered deposit, it is not mined yet and the scientific research is weak. In this study, six samples were collected from the Yaochong Mo deposit for Re-Os isotope measurements in order to constrain the timing of this deposit.

2 Geology

The Yaochong Mo deposit is located in northern Dabie Shan, to the south of the Xiaotian–Mozitan fault. The strata at the deposit is the Dabie metamorphic complex comprised of high-grade metamorphosed plutons and supracrustal rocks either of Archean or Paleoproterozoic ages. Structures are dominated by the NW-trending faults that are subsidiary to the Xiaotian–Mozitan fault and crosscut by the N–S-trending faults. Intrusions in the Yaochong Mo deposit are mainly the Yanshanian granitoids. The quartz-diorite outcropped in the western. The latest granite porphyry dykes occur along the NW-trending and is considered to connect with the concealed granite, which are composed of plagioclase, K-feldspar, quartz and minor...
A total six ore samples were collected from the ore deposit for Re-Os dating in this study, the sampling locations and their ore types are described in Table 1. The samples were carefully identified under binoculars and then molybdenite separates were picked out by hand, which should be fresh, non-oxidized, and pollution-free. The samples were dissolved in the Carius tube. The brief procedure is described as Mao et al. (2008).

3 Results

The isotopic components, the abundances of Re and Os of the ores from the Yaochong Mo deposit are shown in Table 3. The molybdenite Re-Os model age acquired by this study is 136.2±2.0–138.0±2.0 Ma, with an average of 137.2±2.0 Ma, coinciding well with the rock-forming ages. By using model 1 of the ISOPLOT software (Ludwig, 1999), the six analyses may define a good isochron, with an age of 136.9±1.2 Ma. In the past several years almost all Mo deposits in Eastern Dabie ore belt have been precisely dated using the molybdenite Re/Os. The Re-Os isotope model ages obtained are between 155.7±5.1 ~111.1±1.2 Ma and are formed in two episodes: one in the Late Jurassic-Early Cretaceous at 157.8±0.79 Ma and the other in the Early Cretaceous at 127.82±0.87-111.1±1.2 Ma. They are linked to the tectonic regime of lithospheric thinning, asthenospheric upwelling and partial melting of the crust.

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