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北秦岭马河钼矿区花岗岩类的锆石U-Pb年龄、地球化学特征及其地质意义

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摘要:

本文对北秦岭马河钼矿区桃官坪中-细粒二长花岗岩和西沟斑状二长花岗岩进行了LA-ICP-MS锆石U-Pb年龄测定,分别获得了 $157 \pm 1\text{Ma}$  (NSWD=13)和 $153 \pm 1\text{Ma}$  (NSWD=14)的谐和年龄,表明其为晚侏罗世侵入体。马河钼矿的形成与这两个侵入体密切相关,据此限定该钼矿床成矿时代略晚于 $157 \sim 153\text{Ma}$ ,为侏罗世晚期成矿。桃官坪和西沟花岗岩具有高硅(68.12%~76.33%),富碱( $\text{Na}_2\text{O} + \text{K}_2\text{O} = 6.35\% \sim 10.38\%$ )的特征, $\text{K}_2\text{O}/\text{Na}_2\text{O}$ 变化较大(0.91~1.89),A/CNK在0.85~1.14之间,为准铝质-弱过铝质高钾钙碱性系列。微量元素上富集U、Pb、Hf等高场强元素,亏损Rb、Ba、K、Sr、P等大离子亲石元素。稀土元素配分曲线为轻稀土相对富集的右倾型,多数具有弱的负铕异常( $\delta\text{Eu} = 0.5 \sim 0.9$ ),少数样品具有弱正铕异常( $\delta\text{Eu} = 1.05 \sim 1.08$ )。与华北地块南缘与钼矿有关的花岗岩相比,二者均具有高硅、高钾、富碱的特征。但马河钼矿区成矿花岗岩比华北地块南缘的稍基性,这可能是导致马河钼矿的矿床规模比华北地块南缘较小的原因之一。

英文摘要:

LA-ICP-MS U-Pb dating for the granites from the Taoguanping and Xigou plutons in the Mahe Mo deposit in the North Qinling yields concordant ages of  $157 \pm 1\text{Ma}$  (NSWD=13) and  $153 \pm 1\text{Ma}$  (NSWD=14) respectively indicating that the two plutons were formed at late Jurassic. The Mahe Mo deposit is closely related to the two plutons. Therefore these ages may suggest the Mo deposit formed at Late Jurassic appreciably later than  $157 \sim 153\text{Ma}$ . The granites from the Taoguanping and Xigou plutons are characterized by high in silica (68.12%~76.33%) and alkali ( $\text{Na}_2\text{O} + \text{K}_2\text{O} = 6.35\% \sim 10.38\%$ ) with the A/CNK of 0.85~1.14 and larger variation of  $\text{K}_2\text{O}/\text{Na}_2\text{O}$  (0.91~1.89), showing that they are metaluminous or weakly peraluminous and high-K calc-alkaline series. The Taoguanping and Xigou granites are enriched in U, Pb, Hf, but depleted in Rb, Ba, K, Sr and P. The REE patterns are characterized by enrichment in LREE with weak negative abnormal of Eu (0.5~0.9), but a few samples have weak positive Eu anomalies (1.05 to 1.08). The granites are similar to the molybdenum deposits related granites in the southern margin of the North China Block in enriched in  $\text{SiO}_2$  and  $\text{Na}_2\text{O} + \text{K}_2\text{O}$ . However, these granites are lower in  $\text{SiO}_2$ ,  $\text{Na}_2\text{O} + \text{K}_2\text{O}$  and higher in CaO and MgO than the granites in the southern margin of the North China Block. It may be one reason that the Mahe Mo deposit is not as larger as the deposits in the southern margin of the North China Block.

关键词: [花岗岩](#) [LA-ICP-MS锆石U-Pb年龄](#) [地球化学](#) [马河钼矿](#) [北秦岭](#)

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