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摘要：

柴胡栏子金矿位于华北板块北缘,属中温热液蚀变岩型金矿。金成矿与矿区北部的早中生代辉石闪长岩体有密切关系。在辉石闪长岩体内发育大量包体,可以分为基性麻粒岩和角闪岩两类包体。包体的地球化学、形成温压条件表明基性岩包体为来源于大陆下地壳的基性麻粒岩包体,来源深度大约相当于下地壳中部-中上部位置,为早中生代时期底侵作用的产物。角闪岩包体来源于下地壳上部-中地壳下部位置,被上升岩浆带至地壳浅部。包体和寄主岩石具有相似的地球化学和氧、铅、锶、钕同位素特征,说明二者具有相同的岩浆来源。基性麻粒岩包体为底侵作用早期形成的堆晶岩受到后续岩浆的烘烤发生麻粒岩化形成。基性麻粒岩和寄主岩石辉石闪长岩与金矿床形成的密切时空关系显示底侵作用对柴胡栏子金矿含矿流体形成、运移和矿质富集有重要控制作用,其中 H2O和CO2等挥发性组分对控制流体形成和演化有至关重要作用。基性麻粒岩包体发育为成柴胡栏子金矿成矿物质来源于深部提供了有力的证据。

关键词：基性麻粒岩包体 金矿床 柴胡栏子 矿床地球化学 底侵作用

The Mafic Granulite Xenoliths and Its Implications to Mineralization in Chaihulanzi Gold Deposit, Inner Mongolian, China

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Abstract:

Chaihulanzi gold deposit is an alteration-type mesothermal gold deposit, situated in the northern margin of North China Plate. Its metallogenesis is related to the early Mesozoic augite diorite, in which anumerous xenoliths were occurred, at the northern part of the ore deposit. The xenoliths at the Chaihalanzi gold deposit maybe grouped as mafic and amphibolite xenoliths. The mafic xenoliths usually have fine blastic texture and cribriform blastic texture, mainly consist of clinopyroxene, hypersthene and mafic plagioclase, and various amount of amphibolite and phlogopite which was formed in late retrograde metamorphism. Amphibolite xenoliths has granoblastic texture and replacement texture, mainly consists of amphibolite, plagioclase and less amount of pyroxene and quartz. Geochemistry, P-T conditions and isotopes of the mafic xenoliths indicates that it has experienced granulite metamorphism, was from continental lower crust and resulted from the magmatic underplating during early Mesozoic. The amphibolite xenoliths were from the upper part of lower crust and the lower part of middle crust, bring up to the shallow area of crust . The occurrence of mafic granulite xenoliths and regional geotectonic data indicate that the lithosphere of studied area was in extensional state, which has provided favorable tectonic background for basalt underplating. The similarity in geochemistry and isotopic composition between host rock and mafic granulite xenoliths indicate that they were the product evolved from the same magma sources. The cumulates deposited from early underplated basalt magma were heated by later arrived basalt magma, experienced granulite facies metamorphism, then entrained and were transported into shallow crust as mafic granulite xenoliths by the evolved diorite magma resulted from underplated basaltic magma. The closely relationship between mafic granulite xenoliths, host augite diorite and gold deposit suggests that the underplating during early Mesoic had been played an important role to the ore source, the formation and migration of ore-forming fluids and the precipitation and enrichment of in Chaihulanzi gold deposit, H2O and CO2 constitutes is key factors to control the formation and evolution of ore-forming fluids. The occurrence of the mafic xenoliths vigorously supports the point of view that the metallogenetic material of Chaihulanzi gold deposit was from the deep area.

Keywords:mafic granulite xenoliths gold deposit Chaihulanzi geochemistry underplating

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