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黄岩海山链俯冲与吕宋岛斑岩铜金成矿

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摘要:

菲律宾吕宋岛上约5Ma以来的斑岩铜金矿床主要集中在北部的Baguio和Mankayan地区,它们在时空上与黄岩海山链密切相关。1907~2013年间的地震数据表明,在吕宋岛中部(16°N)附近存在地震稀疏带。吕宋岛上的斑岩铜金矿床分布在该地震稀疏带的两侧。收集到的相应时期埃达克岩的Sr/Y-(La/Yb)_N、Sr/Y-Y和La/Yb-Yb图解表明,这些埃达克岩几乎都是洋壳部分熔融形成的。与吕宋岛北部侵入型埃达克岩相比,位于16°N附近的埃达克岩具有更高的Sr含量,这可能与南海古扩张脊俯冲撕裂形成的板片窗有关。斜长石是辉长岩的主要矿物之一,因此,撕裂的洋壳边缘的辉长岩层部分熔融,形成具有更高Sr含量的埃达克质岩浆。而位于吕宋岛南部Bataan弧中的埃达克质火山岩,可能是在南海古扩张脊俯冲之前形成的。根据已发表的斑岩铜金矿床数据,Mankayan地区的成矿年龄在约3.5~1.4Ma, Baguio地区的成矿年龄在约3.1~0.5Ma之间,有从北向南变年轻的趋势,这与黄岩海山链沿马尼拉海沟向南迁移一致。此外,吕宋岛北部Mt. Cagua到Baguio之间存在一个延伸了220km的第四纪火山活动的空隙,该区域大部分火山已经在中新世停止活动。这可能是黄岩海山链的俯冲使得俯冲倾角逐渐变缓、挤压加强而导致的。同时期的斑岩铜矿床正好分布在这一火山空隙中,是俯冲洋壳部分熔融的产物。

英文摘要:

The porphyry Cu-Au deposits since about 5Ma in Luzon, Philippines are clustered together in Baguio and Mankayan district s. Seismic data between 1907 and 2013 show that a low frequency of earthquake events happened in the area near 16°N in central Luzon, and the porphyry Cu-Au deposits are located on both sides of this area. As indicated by the Sr/Y-(La/Yb)_N, Sr/Y-Y and La/Yb-Yb diagrams of the known contemporary adakites in Luzon, the genesis of almost all these adakites are associated with partial melting of subducted oceanic crust. Comparing with adakites located in Northern Luzon, those in Central Luzon (near 16°N) have higher Sr concentration. It might be associated with the slab window caused by the subduction of the South China Sea fossil ridge (Huangyan ridge). Plagioclase is one of the main minerals in gabbro. Therefore, melting of gabbro layer in the oceanic crust that was tearing and exposed to asthenospheric mantle formed magmas with higher Sr concentration. Adakitic volcanic rocks in Bataan arc might be formed before the subduction of the ridge. According to the known porphyry Cu-Au deposits, the forming ages of the deposits in Mankayan and Baguio districts are about 3.5~1.4Ma and 3.1~0.5Ma, respectively. It shows that the ages of these deposits located in northern Luzon trend are younger from north to south, which is consistent with the southward migration of Huangyan Ridge along the Manila Trench. There was a Quaternary volcanism gap, where most of volcanism had stopped in Miocene and extending about 220km between Mt. Cagua and Baguio in northern Luzon. This volcanism gap might be produced by decreasing angle of dip due to the subduction of Huangyan Ridge. Contemporary porphyry deposits are located on this volcanism gap, and have a genetic relationship with the partial melting of subducted Huangyan Ridge.

关键词: [海山链俯冲](#) [板片窗](#) [斑岩铜金矿床](#) [埃达克岩](#) [富铋玄武岩](#) [菲律宾吕宋岛](#)

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