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西藏雅鲁藏布江缝合带西段发现高铬型和高铝型豆荚状铬铁矿体

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摘要：

豆荚状铬铁矿按其矿物化学组分分为高铝型($Cr^{\#}$值为20~60)和高铬型($Cr^{\#}$值为60~80)两类(Thayer, 1970),在全球已报道的豆荚铬铁矿中普遍为在一岩体内只存一种类型的矿体,而在同一岩体内发现两种类型的铬铁矿体较少见。位于雅鲁藏布江缝合带西段普兰岩体中首次发现同时存在高铬型和高铝型铬铁矿,岩体由地幔橄榄岩、辉长辉绿岩、火山岩等组成。地幔橄榄岩主要为方辉橄榄岩、纯橄岩和少量二橄榄岩。在方辉橄榄岩中发现7处透镜状的铬铁矿矿体露头,矿石类型主要有致密块状、稠密浸染状和稀疏浸染状等。矿体长2~6m,厚0.5~m,矿体的最大延伸方向为北西-南东向,与岩体的展布方向一致,矿石的$Cr^{\#}$=52~88,高铬型铬铁矿包括Cr-2~5矿体,$Cr^{\#}$值为63~89,高铝铬铁矿有Cr-1和Cr-6矿体,$Cr^{\#}$=52~55。矿石中脉石矿物主要为橄榄石、角闪石、蛇纹石等。普兰地幔橄榄岩的矿物结构显示,岩体经历强烈的部分熔融以及塑性变形作用,地幔橄榄岩的地球化学特征显示岩体形成于MOR,后受到SSZ环境的改造。并且依据铬尖晶石-橄榄石/单辉石的矿物化学成分,识别出普兰地幔橄榄岩至少经历了3次不同的部分熔融,包括早期部分熔融(~10%)、晚期部分熔融(20%~30%)和后的减压部分熔融作用(~15%)。对比其他铬铁矿矿体和地幔橄榄岩的矿物组合,矿物化学和地球化学等,显示普兰豆荚状铬铁矿矿体与典型高型、高铝型铬铁矿具相似性,并存在较大的找矿空间。

英文摘要：

Based on their mineral chemistry podiform chromitites are divided into high-alumina ($Cr^{\#}$=20~60) ($Cr^{\#}$=100×Cr(Cr+Al)) and high-chromium ($Cr^{\#}$=60~80) varieties (Thayer, 1970). Only one type occurs in a given peridotite massif although some ophiolites contain several massifs which can have different chromitite compositions. We report here the first known occurrence of both high chrome and high alumina chromitite in a single massif, the Purang mafic-ultramafic body in the western Yarlung-Zangbo suture zone of Tibet. This massif consists chiefly of mantle peridotite, with lesser amounts of pyroxenite and gabbro. The mantle peridotites are mostly harzburgite and minor lherzolite; a few dike-like bodies of dunite are also present. Seven small, lenticular bodies of chromitite ore have been found in the harzburgite, with ore textures ranging from massive to disseminated to sparsely disseminated; no nodular ore has been observed. Individual ore bodies are 2~6m long, 0.5~2m wide and strick NW, parallel to the main structure of the peridotite. Ore bodies 1 and 6 consist of high-Al chromitite ($Cr^{\#}$=52~55), whereas orebodies 2, 3, 4 and 5 are high-Cr varieties ($Cr^{\#}$=63~89). In addition to magnesiochromite, all of the orebodies contain minor olivine, amphibole and serpentine. Mineral structures show that the peridotites experienced plastic deformation and partial melting. The mineralogy and geochemistry of the Purang peridotites suggest that they formed originally at a mid-ocean ridge(MOR) and were later modified by suprasubduction zone(SSZ)melts. Base on the chemical composition of spinel-olivine/clinopyroxene we can identify Purang peridotite have three stage different partial melting, including the early partial melting (degree about 10%), later partial melting (degree about 20%~30%), and partial decompression partial melting (degree about 15%). Compare to other typical high Al and high Cr podiform chromitite and peridotite in mineral assemblages, miner

chemistry and geochemistry show that there are many similar character, even existence a good prospecting space.

关键词：高铬型铬铁矿 高铝型铬铁矿 地幔橄榄岩 部分熔融 雅鲁藏布江缝合带西段

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