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雅鲁藏布江缝合带西段普兰蛇绿岩中地幔橄榄岩的岩石学研究

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摘要:

西藏雅鲁藏布江缝合带西段普兰蛇绿岩以出现面积约600余平方千米的特大型地幔橄榄岩体而引人注目。该地幔橄榄岩以方辉橄榄岩为主体, 含有少量的二辉橄榄岩和纯橄榄岩, 岩体中另有一些橄榄单斜辉石岩、辉长岩和辉绿岩等侵入体。地幔橄榄岩的主要造岩矿物橄榄石的Fo 90~93, 其中呈包裹体的橄榄石的Fo略高, 斜方辉石为顽火辉石(En 88~90), 单斜辉石主要为顽透辉石和透辉石, 以低铝(0.48%~3.96%)和高Mg[#](91~96)为特征, 铬尖晶石的Cr[#]值为18~69, 其中方辉橄榄岩和二辉橄榄岩中的铬尖晶石属富铝型尖晶石, 而纯橄榄岩中为富铬型尖晶石。橄榄单斜辉石岩的橄榄石Fo值一致较低, 平均为88.4, 斜方辉石、En平均87, 单斜辉石以透辉石为主, 铬尖晶石的Cr[#]值为45~69。普兰地幔橄榄岩及橄榄单斜辉石岩都具有相似的稀土元素和微量元素配分模式, 表现为LREE相对富集, Eu亏损不明显, 微量元素中大离子亲石元素含量较低, 部分样品高场强元素亏损, 另一些则相对富集, 显示地幔橄榄岩具有亏损地幔源区特征, 但也具有俯冲带流体的交代特征, 表明普兰岩体可能经历了MOR和SSZ两种构造环境, 该特征与雅鲁藏布江缝合带东段的罗布莎地幔橄榄岩的特征可以对比。

英文摘要:

The Purang ophiolite in the Yarlung-Zangbo suture zone in Tibet is characterized by containing a large mantle peridotite massif of ca. 600km² in area. The mantle peridotite consists of dominant harzburgite, minor lherzolite and dunite, and contains some dikes or veins of olivine clinopyroxenite, gabbro and diabase in the massif. The Fo values of olivine in mantle peridotite vary in the range of 90 ~ 93, and in which relatively higher Fo values of olivine are from the inclusions within other minerals in the rocks. The orthopyroxenes in the rocks are enstatite (En 88~90), and the clinopyroxenes are endiopside and diopside with low Al₂O₃ (0.48%~3.96%) contents and high Mg[#] (91~96) values. Chrome spinels have various Cr[#] values from 18 to 69, and in which aluminum-rich spinels are from harzburgite and lherzolite, but chromium-rich spinels from dunite. In olivine clinopyroxenites, olivines have uniformly low Fo values of around 88 and orthopyroxenes have En values around 87. Clinopyroxenes in the rocks are dominated by diopside, and chrome spinels contain both aluminum-rich and chromium-rich types with Cr[#] values varied in the range of 45~69. The mantle peridotite and olivine clinopyroxenite in Purang have the similar distribution patterns of rare-earth elements and trace elements, characterized by their slightly enrichment in LREE and weakly depleted in Eu, relatively lower content of large ion lithophile element (LILE), and either depleted or enriched in high field-strength element (HFSE). These features imply a depleted mantle source, which were overlapped by fluid alteration in a subduction zone. It concludes that the Purang ophiolite formed in a MOR setting and was modified by fluids in a SSZ setting, similar to the Luobusa ophiolite in the eastern Yarlung-Zangbo suture zone.

关键词: [地幔橄榄岩](#) [蛇绿岩](#) [普兰](#) [雅鲁藏布江缝合带](#)

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