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东波超镁铁岩体:西藏雅鲁藏布江缝合带西段一个甚具铬铁矿前景的地幔橄榄岩体

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摘要：

东波超镁铁岩体产在雅鲁藏布江缝合带的西段,与周边白垩纪沉积岩地层和火山岩以断层接触。航磁资料显示该岩体约400km^{2}规模,地表出露连续,地下有一定延深。超镁铁岩体由亏损的地幔橄榄岩组成,主要有高镁的方辉橄榄岩、纯橄岩和少量二辉橄榄岩。方辉橄榄岩和二辉橄榄岩中橄榄石和斜方辉石属高镁型,分别为 Fo=89.5~91.5和Mg$^{\#}$=90~91.5。但二辉橄榄岩中的Al_2O_3和CaO含量明显高于方辉橄榄岩。方辉橄榄岩中单斜辉石Mg$^{\#}$=92~95,二辉橄榄岩的Mg$^{\#}$=92~93,两者的值也重叠。二辉橄榄岩中的Al_2O_3和CaO含量要明显高于方辉橄榄岩。这些均为阿尔卑斯型地幔橄榄岩的典型特征。纯橄岩中的橄榄石Fo=92~93.2,其斜方辉石和单斜辉石的Mg$^{\#}$=~93,但Al_2O_3和CaO的含量比方辉橄榄岩和二辉橄榄岩的低。三种岩石的成分变化规律,反映了地幔部分熔融程度的差异。二辉橄榄岩铬尖晶石的Cr$^{\#}$值20~30,反映为典型深海橄榄岩特征,指示MOR环境。与其不同的是,方辉橄榄岩的铬尖晶石的Cr$^{\#}$=20~75,指示MOR和SSZ两者兼有环境。岩石的原始地幔标准化的REE和微量元素蛛网图模式支持了上述的认识。东波地幔橄榄岩中的岩石学特征与产有大型铬铁矿床的罗布莎地幔橄榄岩可对比,岩体中已多处发现块状铬铁矿石,其铬铁矿的Cr_2O_3含量56%~59%,表明东波是寻找铬铁矿大矿和富矿甚具前景的一个超镁铁岩体。

英文摘要：

The Dongbo ultramafic massif is located in the western part of the Yarlung Zangbo suture zone, where it is in fault contact with the surrounding Cretaceous sedimentary and volcanic rocks. The massif has a surface exposure of about 400km^2, and extends to a certain depth referred by air magnetic pole. It consists of depleted mantle peridotites, mainly high-Mg harzburgite and dunite with minor lherzolite. Both the olivine (Ol) and orthopyroxene (Opx) in the peridotites are highly magnesian (Fo=89.5~91.5) and (Mg$^{\#}$=90~91.5), respectively. The orthopyroxenes in the lherzolite have somewhat higher Al_2O_3 and CaO than those in the harzburgites. Clinopyroxenes (Cpx) in the harzburgite have Mg$^{\#}$s of 92~95, whereas those in the lherzolite range from 92~93. The Cpx in the lherzolites also has higher Al_2O_3 and CaO contents than that in the harzburgite. These are typical features of Alpine mantle peridotites. Olivine in dunite has Fo ranging from 92 to 93.2, whereas Opx and Cpx both have Mg$^{\#}$s of ~93 but lower Al_2O_3 and CaO contents in harzburgite than in lherzolite. The regular variations among the three rock types suggest formation by different degrees of partial melting in the mantle. Chromium spinels in the lherzolite have Cr$^{\#}$s of 20~30, showing an affinity with abyssal peridotites and indicating a MOR setting. In contrast, chrome spinels in the harzburgite have Cr$^{\#}$s ranging from 20 to 75, indicating both MOR and SSZ settings. Primitive mantle-normalized REE patterns and trace element spider diagrams support these inferences. The petrological features of the Dongbo massif are similar those of the Luobusa peridotite massif in the eastern part of the Yarlung Zangbo suture zone, which contains numerous podiform chromitites. These similarities, along with the high content of Cr_2O_3 (56%~59%) in the massive chromitites of the Dongbo massif, suggest that it may also contain a significant large chromite deposit.

关键词：地幔橄榄岩 蛇绿岩 铬铁矿 东波岩体 雅鲁藏布江缝合带

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