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Chemical Characteristics of Cr-spinel of Chromites in Kuda Ophiolite of Western Kunlun and Its Geological Implications

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The Kuda ophiolite belongs to the early Paleozoic ophiolite belt in Western Kunlun Mountains and is composed of metamorphic peridotites, cumulate peridotites, mafic volcanic rocks and quartzites (Li et al., 2008; Dong et al., 2010). The Kuda ophiolite can be divided into four lithofacies, and chromite with the podiform texture occurs in the dunite and pyroxene peridotite facies (Shen et al., 1996). In the light of their geochemical composition, the chromites contain the highest Cr₂O₃ content, maximum Mg[#] value and minimum Fe[#] value in the all samples. It can be inferred that the chromites formed a Mg-rich environment and experienced a higher grade of partial melting. On the basis of olivine-spinel geothermometry, the crystallized temperature of the Cr-spinel is estimated to be from 1366°C to 1404°C, 1379°C on average. Similarly, according to the Cr-spinel geobarometer, the mantle pressure is estimated to be from 2.98 GPa to 3.03 GPa, 3.00 GPa on average. The degree of partial melting of the upper mantle is estimated to be from 17.33% to 18.84%, 18.28% on average. These parameters provide some clues of the physicochemical conditions: these peridotites were derived from garnet lherzolites located in the asthenosphere of the upper mantle, and the

incompatible element-depleted mantle might have resulted from previous partial melting. The tectono - discrimination diagrams imply that the Kuda ophiolite was formed in a island-arc setting overlying subduction zones.

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