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OIB-type Basalts and Its Significance from Dongbo Ophiolite in the West Part of Yarlung Zangbo Suture Zone, Tibet

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Ophiolites that discontinuously crop out along the Yarlung-Zangbo suture zone (YZSZ) are remnants of Neo-Tethyan ocean lithosphere emplaced during subduction of the Indian plate beneath Eurasia. The western part of the Yarlung Zangbo Suture Zone (YZSZ) is divided into two sub-belts, the genesis of the south belt plays a crucial role in the interpretation of the geological setting, magmatic and tectonic processes of the Neo-Tethyan Ocean. Previous research on Dongbo ophiolite was poor, due to harsh natural environment and traffic inconvenience. This paper reports the data on petrography and geochemistry of oceanic island basalts (OIB) type and associated sedimentary rocks in Dongbo ophiolite and discusses the source characteristics and geological significance. Dongbo ophiolite consists of peridotite (including harzburgite, minor Cpx enriched harzburgite and dunite), mafic dikes and submarine volcanic-sedimentary rock sequences, no cumulates and typical pillow lavas. The stable marine volcanic - sedimentary sequence composed mainly of siliceous limestone, red chert, shale interbedded sandstone, basalt and basaltic volcanoclastic rock. OIB-type basalts are characterized by low SiO₂ and MgO, high TiO₂, P₂O₅ and (K₂O + Na₂O),

enrichment of Nb, Ta and REE, depletion of Th, K, Pb, Sr. Trace elements and Sr, Nd, Pb isotope data show that the basaltic source derived from 2% to 5% partial melting of garnet spinel lherzolite. Zircon U-Pb dating from an OIB-type basalt yielded a concordant age of 140±0.6Ma. Siliceous rocks are of biogenic origin, and show a close relation to terrigenous component and seamount or island arc basalts on the basis of whole rock geochemical composition. Above evidences indicate that Dongbo volcano - sedimentary sequences resemble the typical seamount features, Dongbo ophiolite probably was related to a plume hotspot. This implies that the plume hotspot underplating and interacting with the subcontinental lithospheric mantle of the Gondwana northern margin, not only promoted opening Daba-Xiugugabu Tethys oceanic basin during Late Upper Jurassic to Early Lower Cretaceous, but also prompted diamond and other abnormal mantle minerals to be migrated shallow mantle and wrapped in peridotite and chromite.

Key words: OIB-type basalt, Chert, Plume hotspot, Ophiolite, Dongbo, Yarlung Zangbo Suture Zone

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