

Deep Minerals in Ophiolitic Mantle Peridotites: Discovery and Progress

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In the classic theory of plate tectonics, ophiolitic mantle peridotites (i.e., abyssal peridotite) are thought to originate in the shallow mantle beneath ocean spreading centers. Diamonds and other UHP minerals have been found in ophiolitic mantle peridotites and chromitites along the Neo-Tethyan Yarlung Zangbo suture of southern Tibet, and in a Paleozoic ophiolite in the Polar Urals of Russia, suggesting that UHP minerals may be widespread in ophiolitic peridotites. Diamonds from these different localities all have very similar features in C isotope and mineral inclusions,

and are distinct from the other two well known types, i.e. kimberlitic diamonds and UHP metamorphic diamonds. The occurrence of diamond in ophiolite indicate a completely new environment for diamond formation, which can be regarded as ophiolite-type diamond. These new findings indicate a need to reconsider the nature of the upper mantle and the conditions under which ophiolites form.

Key Words: diamond; deep mineral; peridotite; ophiolite, Tibet