Peperites Associated Pillow Lavas within Ophiolites and New Insight to Tectonic Setting: Comparative Study between Oman and West Junggar of China

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Abstract: Peperites are generated by magma intruding and mingling with wet unconsolidated or poorly consolidated sediments. Late Paleozoic peperites have been identified in the Darbut and Baijiantan ophiolitic belts at West Junggar, NW China. The peperites form successions up to 500 m thick interbedded with basaltic lava (sometimes pillow lava) and sedimentary rocks (i.e. limestones). The peperites are described and interpreted as resulting from basaltic lava bulldozed into wet, unconsolidated sediments at their basal contacts. The peperite-bearing units are generally undeformed, occurring in continuous stratigraphic sections distributed regionally over a distance of 100 km on either side of the Darbut and Baijiantan ophiolitic belts, in contrast to the highly deformed slices of ophiolite. They demonstrate that the Darbut and Baijiantan ophiolitic belts should not be interpreted as significant plate boundaries and represent the underlying ocean crust uplifted along tectonic lineaments within a continuous shallow remnant ocean basin. Jordan et al. (2008) reported an occurrence of peperite in the Oman—United Arab Emirates (UAE) border region. In this border area the field relations of the pillow lavas surrounded by limestone with deformed bedding and peperite boundaries between the pillows and the limestone are consistent with the pillow lavas forming directly within carbonate sediments. The pillow lavas in Oman- UAE border area likely have formed as intrusions into water-saturated carbonate sediments deposited along the edges of seamounts. Based on the comparative study on the peperites associated pillow lavas within ophiolites between West Junggar and Oman, this paper proposes that the ophiolites with peperites associated pillow lavas surrounded by limestone were not formed in a typical ocean basin, but a shallow remnant ocean basin.

Key words: peperite, pillow lava, limestone, tectonic setting, Oman, West Junggar

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Fig. 1. Carbonate sediments between lava pillows (Left: Oman; Right: West Junggar).

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