

The geological characteristics of India Ladakh - Pakistan Kohistan island arc and volcanic rock

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India Ladakh - Pakistan Kohistan island arc is situated in between Ladakh area northwestern India and the northern Pakistan, land arc belt is called as Ladakh one or Dras one in Ladakh area northwestern India (Clift et al, 2002). The northern boundary of belt is MKT or which is called as Shyok ophiolite complex belt, the southern boundary of belt is IYS ophiolite complex belt. The area is divided into Ladakh massif (Paleozoic sedimentary rock, volcanic rock, granite batholith) and Dras volcanic arc from north to south. The Dras volcanic arc is tectonic microlithon which is reversed northwards over the Ladakh massif, the time of volcanic rock Dras group is Cretaceous which is probably over the Chilas complex, which both is formed into ocean inner arc (Clift et al, 2002). Volcanic rock after the collision is called as Kardung formation, SHRIMP zircon U—Pb age is 67~60Ma (E1) (Dunlap et al, 2002), which is probably equal to the volcanic rock of Linzizong Group. the collision time of volcanic rock arc in area with Eurasia continent is 83.5~93.5Ma (Clift et al, 2002). The characteristics of the volcanic rock lithogeochemistry shows that it is influenced by the contamination of continental sedimentary rock before the collision, compared by the western the Pacific island arc, which is testified that the Dras volcanic arc is nearer to the Eurasia continent. compared by Dras volcanic rock, Kardung volcanic rock after collision is characterised by LREE enrichment, the higher Th/La, the lower εNd, which shows that more continental crust matter is influenced by the contamination of Kardung volcanic rock. In the Dras collision, 20% percentage of Nd is Kalakunlun massif, 45% percentage of Nd in Kardung is from this area (Clift et al, 2002).

Kohistan island arc is situated in northern Pakistan, to the west of the high Himalaya crystalline wedging body which is belong to the west part of Gangsisi grand island arc belt, the southern and northern boundary is MMT and MKT, namely is main mantle fault and main Kunlun fault, the two fault is linked with India river and Bangonghu-Yaluzangbu river. Main Kunlun connection fault (MKT) is called by northern, which is regard as a branch of IYS (Tahirkheli, 1996), the belt is called as Shyok connection belt or ophiolite complex belt in Ladakh area which is connected with Bangonghu belt in Tibet, China, but also researcher insist that it is connected with the Shiquanhe inner Gangsisi (Dunlap et al, 2002). The Tethyan is behalf of MKT closed in 102~75Ma, which resulted convergence of Ladakh - Pakistan island arc and the northern Eurasia continent. Main collision is behalf of MMT belt is formed in 50Ma almost which result that Kohistan massif overrided the Eurasia continent. Therefore, in the western tectonic area, India Ladakh - Kohistan island arc and northern Eurasia continent have the direct collision (Tahirkheli, 1996): the south belt comprise Jijal complex and Chilas complex, the south belt and the north belt is dismembered by the Kamila hornblende dike swarm. The studies of fossil and

isotopic geochronology shows that Kohistan island arc formed in early-middle Cretaceous period, the Tethyan ocean closed late before long. Paleocene –early Eocene epoch Dir group is composed of Baraul Banda slate at bottom and upper Utror volcanic rock which comprise the andesite, dacite, rhyolite, pyroclastic rock et al. the Kohistan is similar to the Lhasa massif in rock association, it is a ocean inner arc in in early-middle Cretaceous, volcanic rock in Cenozoic era is a result of the intracontinental convergence.