

Continental Subduction of Indian Margin in Himalayan Orogen Leading to Development of Ultrahigh Pressure Metamorphic (UHPM) Regime

SINHA, ANSHU K. Birbal Sahni Institute of Palaeobotany, Lucknow, India

In the Himalayan Orogenic belt the geologic and tectonic setting for Ultrahigh Pressure (UHP) Metamorphism regime, is perhaps the most recent discovery. In 1993 David Spencer first reported eclogite outcrops from Kaghan Valley in Northern Pakistan area. The discovery of Coesite was first reported by Patrick O'Brien in 1999 at 14th Himalaya-Karakoram-Tibet workshop at Kloster Ettal, Germany. Interestingly the eclogite reported by de Sigoyer and others in 1997 and substantiated by Himanshu Sachan from Wadia Institute in 1999 has opened a new vista of pressure regime well above 20 kbar to search for coesite at Tso Morari dome area in Ladakh region. The first discovery of coesite and considering the P-T regime it is estimated from the garnet-clinopyroxene-phengite geobarometry that the northern edge of Indian crustal margin must have subducted to considerable depth of 90 to 100 km, estimating the 27 kbar pressure and almost the three times the normal thickness of continental crust. The ultrabases of the Upper Kaghan Valley have been interpreted as the metamorphic equivalents of mafic lavas, dykes and sills of Permian age corresponding with Panjal Trap volcanics. So it is wisely interpreted by O'Brien that the leading edge of the Indian plate constituting the continental crust was subducted to extreme depth greater than 90 km but also that part was quickly exhumed. Both the areas in Kaghan Valley and Tso-Morari dome lie very close to Indus Suture Zone. Himalayan Orogen is still a grey area to discover more localities of UHPM regime with coesite and diamond.

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