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Zircon evidences, ultrahigh-pressure metamorphic growth of Tso Morari gneisses, Ladakh India

Barun Kumar Mukherjee
Wadia Institute of Himalayan Geology, Petrology & Geochemistry Group, Dehradun, India (barun@wihg.res.in)

The Tso Morari is a metamorphic unit of polyphase paragneiss-orthogneiss –metabasic complex. The metabasics are present as boudins within gneisses, spread over hundreds of kilometre along Indus Suture Zone, Himalaya, and this preserve relict of ultrahigh- pressure eclogite facies. While paragneiss and orthogneiss representing greenschist to low grade amphibolites facies metamorphism at P > 5 kbar and T >550 oC, suggest subsurface metamorphic growth of Tso Morari gneisses. The contrast relationship between UHP -metabsics and surrounding gneisses are due to the subtle preservation of UHP mineral assemblages in the felsic crustal rock. The TMC region usually preserves poor evidence of UHPM, possibly due to the pervasive deformation and strong retrogression process. The key minerals especially UHP indicator normally preserves only in tiny inclusion armor in chemically inert mineral like zircon and garnet. It's a rewarding task to search the inclusion in zircon, exceptionally the unique phases of high pressure mineral like phengite, pyrope-garnet, clinopyroxene, coesite, etc. The above study reveals first evidence of UHP metamorphism preserve within Tso Morari gneissic bodies. The studied zircons from TMC gneisses qualify the extreme UHPM condition suffered by this area at around 50 Ma and these zircons are grown with polyphase metamorphic condition, shown coeval nature to Tso Morari UHP eclogite. Our data provide strong evidence that the metasedimentary rock of$\sim$500 Ma even older could probably occupy core part of the TMC unit including metabasics patches, are suffered maximum grade of metamorphism at $\sim$4 GPa, ever known from Himalaya.