Unusual mantle peridotites and chromitites with ultrahigh pressure (UHP) minerals have been identified in the Luobusa ophiolite of Tibet, suggesting a depth of formation >300 km. Heavy mineral separates from these rocks contain not only UHP minerals such as diamonds and moissanite but a wide range of mantle minerals including native Fe, Si, Ti; metal alloys such as Fe-Ni, Fe-Ni-Cr, and Mn-Ni; oxides such as FeO, Fe₂O₃, MgO, rutile, ilmenite and corundum; sulfides including pyrite, sphalerite, nickel sulfide, bismuth sulphide and tetrahedrite; and silicates, tungstates, phosphates and carbonates.

Preliminary study of corundum grains from the chromitites shows that they contain abundant inclusions including simple oxides (such as rutile); nature titanium; alloys such as Ti-N, Ti-Si, Ti-C, Ti-Si-P, Ti-B and so on; REE-bearing silicate minerals, as well as some unknown minerals. Some of the unusual inclusions, such as Ti-N, Ti-C and Ti-B, range up to 25 μm in size. TiN and BN were previously identified as inclusions coesite from the Luobusa chromitite (Dobrzhinetskaya, 2009). The new discovery of nitrides as inclusions corundum may offer a new window into the deep mantle and the distribution of nitrogen in Earth. Combined the previous study, we conclude that the corundum and their inclusions formed in a high reduced and high pressure environment at deep mantle, and the corundum in the Kangjinla chromitite might be regarded as a new mineral index of a high-pressure environment.

Key Words: mineral inclusions; corundum; chromitite; Luobusa; Tibet

References