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Mineral Inclusions in Corundum from the Chromitites of the Luobusa Ophiolite, Tibet

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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 μ m 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 Kangjila chromitite might be regarded as a new mineral index of a high-pressure environment.

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

References

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