The evolution of melt inclusions in podiform chromitite in Oman

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Melt inclusions are tiny inclusions which trapped in the host magmatic minerals. After trapping, the host mineral can be considered as a closed and isolated system (Roedder, 1984). Thus, melt inclusions behave as time capsules, which record the liquid line of descent of magmatic systems (Frezzotti, 2001). Therefore, melt inclusions can provide important information of the primary melts (Kent, 2008).

We studied the melt inclusions in chromite from a chromitite deposit mine in the north of Maqsad and the core sample from the Oman drilling project phase 2. The silicate inclusions range in diameter from 5 μm to 200 μm, contain pargasite, tremolite, aspidolite, high Cr# (=Cr/[Cr+Al] atomic ratio) chromite, diopside, enstatite, forsterite, grossular, albite, titanite, pentlandite, apatite, chlorite, wollastonite and serpentine. We found the high Cr# chromite occurs as lining of the inclusion, moreover the daughter minerals precipitated in the high Cr# chromite lining. Those phenomenon can be explained by the crystallization of chromite on the wall of inclusion. In addition, this is the first report about the necking down of melt inclusion in chromitite. The necking down of inclusions is an originally large, liquid-filled inclusion divided into smaller inclusions. If the necking down happens after the phase change of inclusion, the compositions of smaller inclusions probably are inhomogeneity. Last year, we conducted the high temperature homogenized experiments, the result showed that the homogenized quenching glass are heterogeneous. We consider the inhomogeneity of inclusions perhaps caused by the necking down. Based above all, we suggest the composition of homogenized inclusion can not represent the parental melt.

To summarize, we suggest before analysis and experiment of inclusions in chromite, the origin and the evolution of inclusions should be carefully studied.

Reference
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