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The mineralization of W from quantitative analysis of fluid inclusions by SXRF and the composition of trace elements

Kyoko Masukawa[1*], Ken-ichiro Hayashi[1], Yoshiro Nishio[2]

[1]University of Tsukuba, [2]JAMSTEC

Fluid inclusions contain direct evidence of the composition of fluids derived from magma. In the study of mineral deposit, chemical analysis of individual fluid inclusion is significant to clarify the mechanism of ore formation in terms of metal transport, fluid cooling, and mineral precipitation. The authors have analyzed concentrations of heavy metals in individual fluid inclusion trapped in quartz at the vein-type W-Sn deposit of the Takatori mine by means of synchrotron X-ray fluoresce (SXRF) method. Early stage fluid contains very high concentration (1,000-10,000 ppm) of metals such as W, Fe, Mn, Cu and Zn. Concentrations of these metals suddenly dropped to several hundred ppm at middle stage, and those of late stage fluid were below the detection limit (<50 ppm). The oxygen isotope of the quartz suggests the origin of ore-forming fluid is magmatic water(Shibue et al., 2005), and the Sr and Li isotope ratios increases at later stages(Masukawa and Nishio, 2008). These data suggest that ore-forming fluid responsible for the Takatori deposit must be magmatic origin; composition of fluid has changed during mineralization through precipitation of minerals and reaction with country rock.
In present study, the result of synchrotron X-ray fluoresce (SXRF) analysis is reviewed, and new analytical data on the trace elements composition of the fluid inclusion extracted by whole rock destruction will be discussed.

Keywords: fluid inclusion, synchrotron X-ray fluoresce, quantitative analysis, W-deposit, Li isotope, Sr isotope