The influence of U, Th mobility in hydrothermal fluids on U-Th radioactive disequilibrium dating of sulphide minerals

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We will show the results of ^{234}U-^{230}Th analyses with a MC-ICP-MS and also compare the results with ages obtained from other dating systems such as ESR dating. We will discuss the influence of U and Th mobility on the U-Th age of sulphide minerals.

Four hydrothermal sites of the Southern Mariana Trough were dated yielding ages from <100 a to 10 ka (Takamasa et al., 2013; Ishibashi et al., 2015). The results suggested that the oldest age from each site is correlated with the distance from the spreading axis of the Trough. The U-Th radioactive disequilibrium ages were roughly consistent with ESR ages.

Most of the samples from the Okinawa Trough samples yielded younger age than the Southern Mariana Trough. Some of them show inconsistent ages with ESR ages (Kumagai et al., 2015).

Sulphide minerals from some sites showed large variations in U and Th abundances, suggesting open-system behaviour. The large variations were more often observed in the samples from the Okinawa Trough than those from the Southern Mariana Trough. We consider that thick terrigenous sediment in the Okinawa Trough caused large scale migration of U and Th with hydrothermal fluids. We will report the results of leaching experiments in the presentation.