

## ***In-situ* mineral precipitation experiment by using a deep-sea artificial hydrothermal vent**

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During four scientific drilling research cruises at seafloor hydrothermal sites in the middle Okinawa Trough from 2010 to 2016, some drill holes with hydrothermal discharge, so called “deep-sea artificial hydrothermal vents (AHVs)” were formed [1]. These AHVs allowed us to conduct researches from the various aspects of economic geology, geochemistry, petrology, biology and deep-sea engineering [2-5]. We installed totally three Kuroko-ore cultivation apparatuses on the AHVs to perform *in-situ* mineral precipitation experiment by conductive cooling without seawater mixing and long-term monitoring for pressure, temperature and flow rate of hydrothermal fluid together with the load cell to monitor the weight change by hydrothermal precipitation.

One of three Kuroko-ore cultivation apparatuses was at first accidentally filled with pumice fragments derived from drilling waste. Then, hydrothermal fluid passed through pumice fragments and caused hydrothermal alteration and mineralization. As different stages of pumice replacement process by sulfide minerals can be observed, we can take a view of subseafloor replacement mineralization on a deep-sea floor through this *in-situ* mineralization experiment.

[1] Takai et al. (2012) *Sci. Drill.*, **13**, 19-27. [2] Kawagucci et al. (2013) *Geochem. Geophys. Geosys.*, **14**, 4774-4990. [3] Nakajima et al. (2015) *PLoS ONE*, **10**, e0123095. [4] Nozaki et al. (2016) *Sci. Rep.*, **6**, 22163. [5] Bodenmann et al. (2017) *Robomech. J.*, **4**, 22.