

## Storage conditions of microbial core samples from ocean drilling in case of a hydrothermal system, eastern Manus Basin, ODP Leg193

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Recently, microbial studies of hydrothermal area below seafloor have been focused on with the progress of sampling techniques for understanding of the early earth's environments. However, very little investigation of microbial habitat is in felsic volcanic rocks around hydrothermal area below seafloor. Problems on microbial observation techniques, contamination tests, influence to microbes by decreasing pressure are still remained. In this study, microbial samples were collected from drilling of seafloor around felsic-hosted hydrothermal system in a convergent plate margin setting in the eastern Manus Basin in the Bismarck Sea north of Papua New Guinea. Total 27 microbiological samples were collected from 3 drill sites (Site 1188, Site 1189 and Site 1191) for investigation of habitat of microbes. Storage of microbial samples for one year in seawater or artificial seawater are studied.

Whole-round core or large fragments of the core were selected for microbial samples. After the outside of sample was flamed (sterilized) using a torch, the sample was transferred into the anaerobic chamber, usually within 30 min. of the core arriving on deck. The outer surface of the whole-round core was split off using a hydraulic rock trimmer to minimize transfer of drilling-induced contamination from the outer sample surface to the interior of the sample. The trimmed samples were placed in sterile opaque vessels. In addition, the pieces of the samples (0.5 - 5 g) immersed within different seawater types (natural seawater, sterilized seawater, filtered sterilized seawater, artificial seawater) (20 ml) were stored at + 4 degrees centigrade under anaerobic and dark conditions. The changes of microbial habitat in the vessels were observed under optical microscopy during storage of samples. The mineralogical and clay mineralogical properties of 26 microbial samples with the exception of one sample (193-1188A-2R1) were analyzed by a X-ray powder diffractometer. In addition, these chemical compositions were also analyzed under an energy dispersive X-ray fluorescence spectroscopy and a NCS elemental analyzer.

Optical microscopic observation revealed that bacteria exist not only in samples from Site 1188 and Site 1189 which are altered volcanic rocks, but also in unaltered ones from Site 1191. The bacteria in the samples largely did not differ in quantity with the exception of one sample immersed with artificial seawater in which a few kinds of bacteria terribly multiplied. While, bacteria were not found in all samples at deeper than 106.80 m (1188A-13R) below seafloor. These results indicate that the presence of bacteria does not depend on kinds of rock faces and a limitation of temperature, at which bacteria can not be alive, exists. Besides, chemical composition analyses revealed that microbial samples contain C (0.014 - 0.206wt%), S (0.028 - 19.013w %), P (0.04 - 0.57wt%, only sample of 1189B-1R shows less than 0.04wt%) and K (0.08 - 4.48wt%, only sample of 1189B-1R shows less than 0.08wt%). The contents of N show less than 0.01 wt% in all samples. The necessity of these elements for microbes will be estimated in relation with maintenance of bacterial activity and multiply. The utilities of storage of microbial samples in this study will be also discussed.

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