

Numerical simulations of mid-ocean ridge hydrothermal circulation including the phase separation of seawater

yoshifumi kawada[1], Shigeo Yoshida[1], Sei-ichiro Watanabe[1]

[1] Earth and Planetary Sci., Nagoya Univ.

Mid-ocean ridge hydrothermal circulation is a phenomena that seawater enters through oceanic crusts, and cools heat sources underneath the ridge area. This is essentially important to know what decides the environment of habitat of deep-sea biotic communities. We numerically investigated the hydrothermal circulation, including the phase separation of seawater. We found that the phase separation leads to two-layered structure. The seawater circulates vigorously in the upper layer, whereas dense brine settles to form a stagnant lower layer. This is the most important mechanism to decide the temperature and concentration of hydrothermal fluids.