

Geochemistry of pore waters around gas chimney structures in the Mogami Trough, Japan

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Shallow gas hydrates have been often found on the gas chimney structures in the eastern margin of the Japan Sea. Although the strong gas flux through the gas chimney is a key for the massive accumulation of gas hydrates near the seafloor, geochemical nature inside/across the gas chimney has not been discussed well. We have collected pore waters from shallow sediment inside/outside the gas chimney in the Mogami Trough and analyzed major ion concentrations to understand the special change of pore water geochemistry reflecting the activity of gas chimney. We found significant relation between the distance from the center of gas chimney and the gradient of alkalinity/depth of sulfate-methane interface, indicative of methane flux; they decrease similarly in response to the distance, particularly outside the chimney. Although the activity of gas chimney indicated by the chimney size and methane flux varies in the same area of the Mogami Trough, gas hydrates potentially accumulate near the center of gas chimneys.

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