Gas-hydrothermal activity in the Derugin basin (the Sea of Okhotsk).

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The report presents fresh data about hydrothermal activity in the Derugin basin (the Sea of Okhotsk). In sediments of the Derugin basin authigenic barite was found in the early 80's by dredging of small elevations at a depth of 1480-1460 m. In 1998 barite structures were observed in the same region as well (28th German-Russian cruise of RV "Akademik M. Lavrentyev" under the Project KOMEX). A water layer above the barite structures contained high methane concentrations (up to 1780 nl/l).

Studies of the recovered rocks revealed several types of barite mineralization: monomineralic travertine-like barites; barite-siliceous spherulitic formations; cement in polimictic sandstones; "tubular" bodies and vugs within host sediment. Carbonate mineralization is linked to barite mineralization. Carbon isotope composition in carbonates ($\delta^{18}C = -38.8‰$) suggests its formation due to biological oxidation of thermogene methane.

Barite and carbonate mineralizations were also determined in sediment cores taken in the vicinity of the barite structures. But minerals found here are clearly subdivided into authigenic and recycled minerals.

The recycled minerals include specific split barite crystals which form travertines; fragments of barite, barite-siliceous and carbonate tubes.

The authigenic minerals are represented by carbonate and barite nodules, numerous nests of transparent crystalline barite, barite cement, thin barite veinlets, sulfides.

A detailed investigation of authigenic minerals, analysis of sediment microelements allowed one to draw conclusion about a cyclic character of hydrothermal activity in the Derugin basin during Holocene and late Pleistocene and its rise nowadays. High methane content in the bottom water above the field of hydrothermal barite structures confirms our conclusion.