Analysis of aqueous Sr concentration in groundwater of carbon aquifer of Moscow artesian basin

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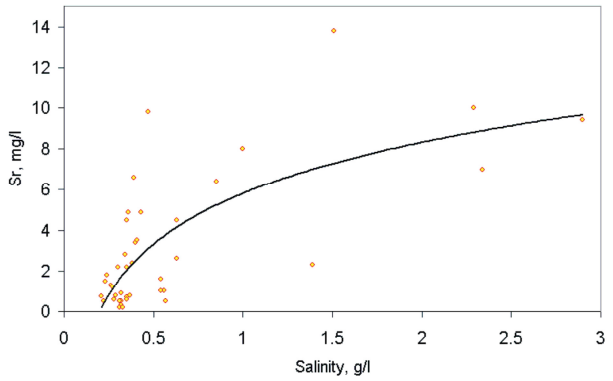
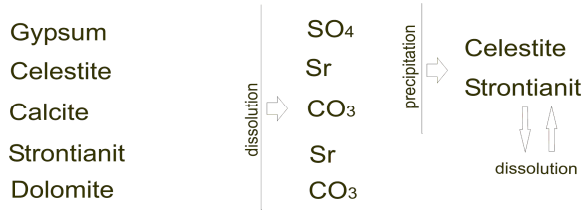
Underground waters of Carbon of Moscow artesian basin are enriched in Sr due to high Sr content in carbonate rocks of the area. The certain part Sr is from clays of confining layers contiguous to carbonate rocks.

The limiting factor of aqueous Sr enrichment is the solubility of Sr minerals. The aqueous Sr concentration curve ($Sr=3.607 \cdot lnS+5.828$, where S is salinity; $R^2=0.508$) is shown in fig below. Two reactions (dissolution of Celestite and deposition of Srtoncianite) occur simultaneously. It results in usually up to 8 - 10 mg Sr /l. In two samples the Sr concentration is even more: 13.8 mg Sr /l (DUBNA borehole, g_2 layer of Upper Carbon) and 27.7 mg Sr /l (KLEPIKI, pd-ks layer of Middle Carbon).



The process of Sr accumulation is influenced by two major factors: the hydrogeochemical type of groundwater alteration along groundwater flow and delay of a groundwater filtration into direction of plunge the water-bearing layers.

Using thermodynamic approach the process of accumulation Sr looks as follows:



Gypsum and Celestite dissolution brings SO_4 and Sr. Stroncianite formation limits the aqueous Sr concentration, thus it is the regulating factor of accumulation Sr in ground waters Moscow artesian basin.

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Formosa Ridge, A cold seep with densely populated chemosynthetic community in the passive margin, southwest of Taiwan

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Chemosynthetic community and massive hydrate are two typical features appeared at cold seep environment. Mussel, clams, bacterial mats, and tubeworms also frequently found in the cold seep environments. In order to understand mechanism driving the chemosynthetic community found in the study area, ROV and Towcam surveys as well as core sampling were conducted on board the r/v Natsushima and r/v OR-I at the Formosa Ridge.

ROV Hyperdolphin survey showed that unusually densely populated chemosynthetic community appeared at water depth of about 1200 m in the passive margin southwest of Taiwan. *Bathymodiolus Platifrons* and *Shinkai cronieri* are two predominant macro fauna, patchy distributed on top of a stratigraphy high with clear Bottom Simulating Reflector (BSR) at depth. Mussel attached on porous carbonate with partially cemented mudstone tubes and laminate acting as gas and fluid conduit. Vent fluids are high in dissolved sulfide and methane. $\Delta^{13}C$ of the authigenic carbonate lamina and vent tubes are as low as -56. Mussel shells, however, showed typical sea water carbon composition. Lower concentrations of pore water chloride indicate hydrate dissociation near surface.

Unlike other cold seep environment, no massive hydrate and tubeworms were found on the sea floor. The chemosynthetic community of the study Formosa Ride is supported by unusually high concentrations of dissolved sulfide and methane seeping through sea floor.