Veined quartz of the Urals: Structure, mineralogy

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There are three major groups of the Ural quartz deposits: the Subpolar Urals group, the Middle Urals group and the South Urals one. The Subpolar group is represented by the typical hydrothermal veined deposits. is Zhelannoe - one of the big Subpolar quartz deposit is discribed. It is located in monomineralic quartzy sandstone. The quartz vein may be to 100 meters thick. Rutile, turmaline, zircon and sericite are the major accessory minerals. The chief deleterious constituent in quartz is water, which is located in gas-liquid inclusions. The effective method for H_2O elimination is described. High quality quartz glass may be produced after primary quartz enriching.

The Middle Urals is represented by two giant quartz deposits: Gora Khrustal'naya and Svetlaya Rechka. Gora Khrustal'naya is represented by one quartz body which size is 380X140X160 m. The content of quartz in this body is 98.89%. Quartz deposit was formed on the big massive of quartz-diorite and granite contact. The main accessory minerals are microcline, muscovite, kaolin, hydrogoethite and pyrite. Quartz has giant crystalline structure. The specific enriching technology is described for this quartz deposit.

The South Ural group of quartz deposits is represented by quartz veins disposed in East part of the Ufaleisky gneiss-migmatite complex. Length of quartz vein area is 50 km. There are more than 3000 quartz veins on this area. Granulated quartz is prevalent for this group of deposits. Field spars, micas, rutile, sphene, ilmenite and carbonates are the main accessory minerals. Concentration of impurities in granulated quartz is as the IOTA STD. There is standard technology of quartz enriching for these deposits.

One more type of quartz deposits associated with small Naily gold deposit is vein Tolstikha. It is situated 35 km north from Miass and localized at the contact of small gabbro pluton with the large Talovskii massif of serpentinized dunites, peridotites, and pyroxenites. This is a new economic quartz object. To date, the gold deposit has been mined. The vein is 1000 m along the strike, up to 50 m wide, and is traced up to 450 m deep.

Biogeochemistry of the deep mud-volcano biosphere in the Kumano forearc basin of the Nankai Trough

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Submarine mud-volcanoes are formed by the vertical intrusion of a lower density and deformable materials from deep realm to the seabed. The mud-volcanism transports deep-sourced fluids, elements and hydrocarbons to the seafloor, of which seepages support chemosynthetic benthic life, including microbial communities that mediate anaerobic oxidation of methane with sulfate reduction. However, biogeochemical and microbiological characteristics of the deep realm of submarine mud-volcano have remained largely unknown.

In 2009 and 2012, using the deep-sea drilling vessel *Chikyu*, we drilled one of the most active submarine mud-volcanoes in the Kumano forearc basin of the Nankai Trough, off the Kii Peninsula of Japan, down to 200 meters from the summit (33°67.581N, 136°56.8085E: 1,986.7 m in water depth). Cell count and molecular analysis indicate the presence of relatively small microbial communities (less than 10^5 cells/cm^3) throughout the cored depth. Carbon isotopic compositions of bicarbonate and acetate in the pore water were found to be highly enriched in ^{13}C. High concentrations of hydrogen were also observed, indicating a thermodynamically preferential condition for microbial acetogenesis via CO_2 reduction (i.e., homo-acetogenesis) rather. Radiotracer incubation experiments showed that activities of homo-acetogenesis were 2-3 orders of magnitude higher than those of homo- and acetoclastic methanogenesis.

Consequently, our accumulative biogeochemical and microbiological data indicate that the deep biosphere in the submarine mud-volcano of the Nankai Trough accretionary wedge is characterized by tectonic and sedimentological regimes, and hence different from the previously explored subseafloor biosphere in stratified sediment on the continental margins.

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