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1. Series of "quartz bubbles". 7 cm high. Demidovsky section, Murzinskoe-1 deposit, Krasnoshchekovskiy rayon, Altaisky Krai, Russia. Inset: magnified fragment. Specimen: Vladimir S. Lednev. Photo: Boris Z. Kantor.

2. "Quartz bubbles". 6 cm high. Demidovsky section, Murzinskoe-1 deposit, Krasnoshchekovskiy rayon, Altaisky Krai, Russia. Specimen: Vladimir S. Lednev. Photo: Boris Z. Kantor.

A pair of interesting specimens from the Murzinskoe deposit, Altai, Russia (Figs. 1, 2) was brought to the authors' attention. They contained a series of "bubbles" of 2 to 8 mm in diameter with shells consisting of tiny quartz crystals.

The Murzinskoe (Murzinskoe-1) gold deposit is a type of skarn (Gusev, 2014) and is located in the Krasnoshchekovskiy rayon of the Altaisky Krai, Russia. It is open-cut mined and contains masses of chalcopryrite, chalcocite, sphalerite, galena, and other sulphides. A mighty oxidation zone is present there.

The specimens mentioned above were found by Vladimir S. Lednev in October 2017 in the Demidovsky section of the deposit at a depth of about 80 m beneath the sur-



7. **Chalcedony** pseudostalactites. Specimen 5.5 cm tall. Staraya Sitnya, Stupino rayon, Moscow oblast, Russia. Specimen and photo: Boris Z. Kantor.

8. **Chalcedony** pseudostalactites. Specimen 7 cm tall. Staraya Sitnya, Stupino rayon, Moscow oblast, Russia. Specimen and photo: Boris Z. Kantor.



action of the oxidation products with carbonate minerals caused the carbon dioxide emission as a "bubble" with low pH. Apparently, these "bubbles" hit in a liquid containing alkali element silicates. Such media are marked by high pH (and monomer-polymer character of mobile silica) which causes their relatively high viscosity. The latter contributed to the relatively slow emerging of "bubbles" and their gliding by the rock surface with branching when met an obstacle (Fig. 2). The high viscosity of the solution contributed to keeping the "bubbles" in the liquid sufficiently long enough to be preserved with a solid silica shell.

The formation of the shell could take place on the contact of media with different pH due to the exchange reaction:



As can be seen in the magnified fragment of Fig. 2, chalcedony was the first to deposit on the "bubble" surface; then a crust of quartz crystals grew over it. This corresponds to the ordinary sequence of pseudostalactite crystallization.

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