Silica deposits Perspectives of the Cenozoic Samtskhe-Javakheti Volcanic Highland, Southern Georgia

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Although silicon is abundant element in Earth's crust, due to impurities in raw material often it is expensive to get high quality silicon dioxide (SiO_2), which is essential for further processing. High demand on pure silicon metal should be noted, especially from the semiconductor industry. Thus, exploration and exploitation of new or known silica resources in a right fashion is crucial for both, economical and technological development [1].

Cenozoic Samtskhe-Javakheti volcanic highland occupies more than 4500 km^2 in southern Georgia. Different episodes of magmatic activities caused various geochemical processes, such as injection of silica rich hydrothermal fluids through structurally weak boundaries of Akhaltsikhe depression and formation of agate, as well as mixing of weathered dacite-andesitic volcanic products with local lakes, which fed diatoms with silica and later resulted in deposition of diatomite.

Kisatibi diatomite deposit is of very high quality. There are four major types of diatomite, among which white species contain SiO_2 – 90.75% and Fe_2O_3 – 1.51%; other types are slightly more contaminated with clay minerals, but in general possess nearly the same features: SiO_2 – 85.39-87.45% and Fe_2O_3 – 1.51%. Porosity changes from 63.09 to 75%. Total amount of reserves – 7 995 000 tonne [2].

As for Akhaltsikhe agate deposite, they are products of intense hydrothermal alteration and leaching of middle Eocene andesitic formations. Average chemical composition is: SiO_2 – 97.17-98.89%, iron oxides – 0.18-0.97%. Total amount of reserves – 2 785 945 tonne [3]. This deposit are exploited mostly for technical purposes.

Considering the size of the Samtskhe-Javakheti volcanic highland, it is expected that similar types of other silica rich deposits will be revealed by future geological investigations.

[1] Lifton (2008). [2] Peradze *et al.* (1984); [3] Sharonov *et al.* (1958).