The pecularities of Khasurta massif rocks formation on the melt inclusion study (Angaro-Vitim batholith, Western Transbaikalia)

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The Khasurta pluton (about 900 km^2) presents early phase of the Angara-Vitim batholith formation. On the south this pluton is overlapped by Mesozoic and Cenozoic deposits of the Udinskaya intermontane trough, on the north it is limited by a regional break, and on the east and west it intrudes Proterozoic - Early Cambrian volcano-terrigenous and terrigene-carbonaceous sediments. As a whole the pluton is in discordant contact with surrounding rocks.

The pluton's interior is not homogenous and consists of monzonitic and granosyenitic rocks. As a rule surrounding carbonaceous rocks are substituted by scarns in contact with the pluton.

Zircon grains were selected from monzonites. Zircon grain sizes of - up to 1 mm in length, they often form intergrowths. Small crystals (200 - 600 microns) have a zircon habit, and a light pink color.

Melt inclusions in zircon grains from monzonites were studied. A composition of ungomogenized melt inclusions was analysed using the electron microscope (LEO 1430 VP), have been identified: quartz, K feldspar, plagioclase, apatite, muscovite.

Six experiments each with a duration of about 1-3 hours at different temperatures (800-1000°C) were carried out (inclusions size – 4-10 μm). Using an electron microscope the composition of the three homogenized inclusions has been studied. Its composition is more acidic as compared with monzonite and has increased Na, K content.

Thus, based on these results we conclude that Khgasurta massif rock crystallisation temperature was more than 920°C. Monzonites are represent acid ("sienitic") magmas cumulates. High Na and K content permit to suggest monzonite affiliation to the shoshonitic series.

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Radiochemical analysis of environmental radioactivity for surveillance and characterization

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Great changes have been achieved in the world politics and economics with the development of nuclear science and technology. However, many problems in the sustainable developing of society and potential risks to the ecology have been also aroused by radioactive pollution. To assess the risk of radionuclides in environment, not only the total amount but also the biogeochemical behavior, the origin and the diffusion (migration) path of these radioactive pollutants in environment need to know. For this purpose, radiochemical analytical methods are keys to characterization of radioactivity.

Since 1990s, inductively coupled plasma mass spectrometry (ICP-MS) has been widely used for monitoring trace radionuclide and identifying the source terms for different environment samples, including soil, underground water, plants and air [1]. In our laboratory, different analytical methods based on ICP-MS measurement and radiochemical separation have been developed to monitor and characterize radionuclides in environment. This work aims to summarize the newly developed analytical methods using UTEVA extraction chromatography combined with ICP-MS for monitoring transuranium nuclides in soil [2] and a direct aerosol measurement attempt with ICP-MS for determining the radionuclide concentration in air [3]. Meanwhile, the result of an environmental radioactivity investigation will be presented to show the bioavailability of radionuclides of different origin [4], as well as the radioactivity transfer from soil to plant. In addition, the developed methods to identify nuclear materials by isotopic signature and age determination have also been well shown with satisfactory result [5]. However, tackle for very low level contamination and for deliberately mixed material is still a challenge to work on.

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