



Chemostratigraphy of early Neoproterozoic sedimentary rocks of Yenisei ridge (Siberia, Russia)

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One of the biggest Proterozoic sedimentary basins in Russia is around the Siberian platform. This study about little part of them - Neoproterozoic sedimentary rocks of Yenisei ridge (Southwestern margin of Siberian Platform). These geological structure is ancient and very difficult for research. It is a collage of different blocks: volcanic arcs, ophiolite complexes and sedimentary rocks of various ages and degrees of metamorphism.

Sedimentary complexes of Siberian platform are outcropping along Angara River and its tributary. Neoproterozoic ones are presented by terrigenous-carbonate rocks of Tungusik and Oslyan groups. Despite the long study history of the area is still controversial question of time of formation of these rocks. As determination of the age of Precambrian sedimentary rocks is very difficult, Sr isotopic chemostratigraphy appears to be the only approach to establish the age of carbonate sequences. All Rb-Sr author's data was investigated by the method of selective dissolution with the preliminary removal of epigenetic carbonate phases. The isotope dilution method with mixed $^{87}\text{Rb} + ^{84}\text{Sr}$ spike was used to determine Rb and Sr concentrations in both fractions on the MI 1201AT mass spectrometer. Sr isotope ratios were measured on the Finnigan MAT-262 (BAC CU, Irkutsk, Russia) and Triton Plus (IGG UB RAS, Ekaterinburg, Russia). The C-O isotopic composition in carbon samples was measured on the Finnigan MAT-253 equipment.

The main criteria for integrity were correlations of impurity-elements (Mn, Fe, Sr) and stable isotopes (C, O) with each other. The less altered rocks of the Tungusik Group are characterized by $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of 0.7055-0.7058, and wide variations in the $\delta^{13}\text{C}_{\text{PDB}}$ values from 0 to +5‰ [1]. The primary $^{87}\text{Sr}/^{86}\text{Sr}$ of Dashka Formation (Oslyan Group) is 0.7057 - 0.7060 and $\delta^{13}\text{C}_{\text{PDB}}$ value varies in interval 3.7-4.3‰ like in upper part of Tungusik Group. High positive values of $\delta^{13}\text{C}_{\text{PDB}}$ indicate that carbonates had accumulated in warm sea, without a long period of cold weather.

Comparison of isotopic (Sr, C) characteristics Dashka Formation carbonates show identity of these indicators with Tungusik Group rocks. In addition can be compared with carbonate sequences of: Minyar Formation (Pb-Pb age of 780 ± 85 dolomites Ma [2]) Karatav Group in Southern Ural ($^{87}\text{Sr}/^{86}\text{Sr}$ 0.7055-0.7056, $\delta^{13}\text{C}_{\text{PDB}}$ +2.4 + ... 3.0 ‰), also the Reynolds Point Formation of Shaler Group (about 840 million years; [3]) and the lower part of Little Dal Formation in Canada (more than 780 million years [4]). Such agreement chemostratigraphic characteristics of these formations is the basis for their correlation and allows to consider that carbonate rocks of Oslyan and Tungusik groups had deposited in the first half of Neoproterozoic (1000 - 800 million years ago).

The work was supported by the RFBR (projects nos. 12-05-00569, 12-05-33076) and the Presidium of SB RAS (project no. 68).

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