Geochemical diagnosis of Vendian-Lower Paleozoic psephites of Sablya Ridge (sub-polar Urals)

I. V. KOZYREVA AND N. YU. NIKULOVA

Institute of Geology of Komi Science Centre of Ural Branch of Russian Academy of Sciences
167982, Pervomayskaya 54, Syktyvkar, Russia
e-mail: kozyreva@geo.komisc.ru

Sablya Ridge is located in the central part of Sub-Polar Urals and represented by anticline, which core is composed of metamorphized basic volcanites (RF_3–V sb) corresponding to the settings of active continental margins. Overlying psephites don't have a definite interpretation of age and origin and are interpreted as marine or continental from Upper Riphean to Lower Ordovician. Our studies revealed that psephite rocks are inhomogeneous – the basic volacnites are overlaid by 10 meter layer of cherry-brown tuff gravelites with layers of tuff sandstones and tuff aleurolites overlaid by normal-sedimentary psephites. The tuff gravelites are characterized by filling spherolite and gialoclasts. The tuff gravelites contain (weight %): SiO_2 68.44–76.45,TiO_2 0.91–1.86,Al_2O_3, 8.79–10.55, Fe_2O_3 4.58–9.02, FeO 0.59–2.96, MnO 0.027–0.087, MgO 1.1–2.92, CaO 0.05–0.3, P_2O_5 0.079–0.38. They represent sedimentary-volcanoclastic formation with the signs of underwater extrusions, which material composition was resulted from mixing of underwater explosive, teffroid and sedimentary material. The gravelites by their texture-structural characteristics correspond to marine sediments of tidal facial type and are identical to Lower Ordovician psephites from neighboring areas of the Sub-Polar Urals. Interpretation of the results of chemical analyses allowed to trace evolution of composition of tuffogenic-sedimentary and to determine two groups of psephites that differ by their age and genesis – volcanogenic molassa (V_2–$Є_1$lp) and shallow water - marine terrigenous sediments (O_1tl). It is obvious that geochemical features of tuff gravelites can be used as one of diagnostic criteria to separation and correlation of paleontologically uncharacterized coarse clastic rocks.

The work was supported by the Program of Basic Researches UB RAS, project No 15-18-5-46 "Mineragenia of Northern Urals and Timan in connection with the regularities of their geological development, main ore formation epochs".