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Initiation and termination of late Tertiary extension in the lithosphere at the margin of the Baikal Rift Zone, Southern Siberia: Change of sources for volcanism in the Vitim Plateau

Irina Chuvashova (1,2), Sergei Rasskazov (1,2), and Tatyana Yasnygina (1)

(1) Institute of the Earth, Russian Acadimy of Sciences, Irkutsk, Russian Federation (rassk@crust.irk.ru), (2) Irkutsk State University, Irkutsk, Russian Federation

A comparative analysis of major oxides, trace elements and Nd, Sr isotopes in representative sequences of volcanic and subvolcanic rocks from the western and eastern parts of the Vitim Plateau revealed petrogenetic groups with varying proportions of components from the lithospheric and sublithospheric sources. It is inferred that the initial episode of eruptions of picritic basalts and Mg-basanites in the eastern part of the plateau at 16-14 Ma was due to high-temperature melting slightly isotopically depleted peridotite material, which adiabatically ascended from the deep mantle, and strongly isotopically depleted Mg-pyroxenitic material of the lower lithosphere. A wide range of lava compositions in the time interval of 14-9 Ma was provided by processes of "passive" and "active" rifting in the western and eastern parts of the plateau, respectively. A structural reorganization that took place in the Baikal rift system in the past 9 Ma has led to the cessation of rifting in the Vitim Plateau. As a result of the relaxation and smoothing of the thinned lithosphere beneath the eastern part of the area, moderately isotopically-depleted liquids from the asthenosphere, slightly contaminated by deeper isotopically-depleted mantle material, erupted in the time interval of 1,1-0,6 Ma. The study is supported by the Russian Foundation for Basic Research (Grant 14-05-31328).