



Mid-Miocene thermal Impact on the Lithosphere of Asia by sub-lithospheric convective Mantle Material: Temporal Transition from high- to moderate-Mg Magmatism beneath Vitim Plateau, Southern Siberia

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In Inner Asia, high-Mg lavas is characteristic of the Middle Miocene volcanism. In the Vitim plateau, we studied the high- and moderate-Mg volcanics, erupted at 16-14 and 14-13 Ma, respectively. In the former (small volume) unit, initial basaltic melts, contaminated by crustal material, were followed by uncontaminated high-Mg basanites and basalts of transitional (K-Na-K) compositions and afterwards by picobasalts and basalts of K series. In the latter (high-volume) unit, initial basalts and basaltic andesites of transitional (Na-K-Na) compositions and basalts of Na series were overlain by basalts and trachybasalts of K-Na series. From pressure estimates after equation [Scarrow, Cox, 1995], we infer that the high-Mg melts were derived from the sub-lithospheric mantle as deep as 115-150 km, unlike the moderate-Mg ones that were produced by melting of the shallow lithospheric mantle. We suggest that the studied transition from high- and moderate-Mg magmatism reflected the mid-Miocene thermal impact on the lithosphere by a hot sub-lithospheric mantle material from the Transbaikalian low-velocity domain with potential temperature estimates up to 1510 oC. This thermal impact triggered rifting in the lithosphere of the Baikal Rift System.

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