Geochemical features of Meso-Neoproterozoic dolerite sill on the South-East margin of the Siberian Craton.

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Meso-Neoproterozoic dolerite sills and dykes of the south-east margin of the Siberian Craton are commonly known as linked to the Sette-Daban LIP-related event (Ernst, 2014). They are localized in the Maya-Kyllakh zone which represent moderately deformed sedimentary cover of the craton. The mafic intrusions are numerous and variable in size, but the best studied are large sills up to 200 m thick. Smaller intrusions are identified to be related to the same magmatic event according to their appearance and structural position.

There are several U-Pb and Sm-Nd isochron isotopic dates for the rocks of the Ulakhanbam complex, giving a range of values from 930 to 1000 Ma. Although there is an overlap of several dates within error, sills become younger westward from 974-1005 Ma in the east part of the study area to 932-946 Ma in its west part. Due to wide range of ages they likely represent at least 2 different magmatic events, although long-term event is possible as well. To resolve this issue, new accurate dates are needed.

Chemical composition of mafic intrusions is not uniform also varying from east to west. The average Y, Zr, Nb, La, Ce, and Nd concentrations in the intrusions from the east part of the study area are approximately two times higher than in the western ones. The separation into two groups is also observed in triple discriminatory diagrams according to Sm, Ti, V, and Sc. However, εNd(T) values vary from 2.3 to 7.5 without clear correlation with chemical composition. Thus, the revealed patterns basically support interpretation with occurrence of two stages of magmatic activity, the first of which is characterized by enrichment of REEs and other elements.

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