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Current issues of paleomagnetism of the Katav Formation (Upper Riphean, Southern Urals)

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There are two views on the nature of the bipolar high-temperature component of magnetization (HTC) of the redstones of the Katav Formation. The question of the age of the magnetization of the Katav carbonates has not yet been finally resolved, despite the numerous arguments in favor of its primacy that have appeared in recent years. A very large number of changes in magnetic polarity were revealed in the upper part of the section. In case of a more reliable substantiation of the primary magnetization of the Katav sediments and depending on the actual frequency of these reversals, the rocks can record a hyperactive interval during the Neoproterozoic. In this case, the Katav rocks are a convenient object for studying the nature of geomagnetic reversals. In order to judge about the frequency and character of reversals, it is first necessary: 1) to be sure that the high-temperature characteristic component of the magnetization of the Katav carbonates is synchronous with the time of rock formation; 2) to be able to estimate the duration of transient processes. We present new results that provide additional important arguments in favor of the primacy of the characteristic component of the magnetization of the Katav Formation rocks. These are: 1) a positive fold test; 2) a positive reversal test; 3) independence of the characteristic component direction from magnetic mineralogy; 4) the presence of a trend of paleomagnetic directions from bottom to top in the section of the Katav Formation and further to the Inzer Formation; 5) different directions of the characteristic component of Katav and underlying and overlying rocks; 6) clear similarity of the magnetostratigraphic record in distant sections separated by several tens and hundreds of kilometers and located in areas with somewhat different geologic histories. The primacy of the high-temperature component of the magnetization is also supported by the recently published preliminary results of one of the two direct paleomagnetic tests, the conglomerate test, and its new results obtained this year.

The cyclostratigraphic study of variations in magnetic susceptibility of rocks of the upper part of the Katav Formation in the Yuryuzan section made it possible to estimate both the average sedimentation rate and its variations along the section. This makes it possible to estimate the frequency of reversals and the duration of transient processes when studying geomagnetic field reversals.

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