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Cretaceous Magnetostratigraphy of the Severnaya Sosva River (Northern Urals)

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The results of comprehensive paleomagnetic and biostratigraphic study of Cretaceous sediments of the Sosva section (the basin of the Severnaya Sosva River, northwest of Western Siberia) are presented. The deposits of the Upper Albian and Lower–Middle Campanian have been studied. The material for the study was collection of oriented samples selected from a natural outcrop located in the basin of the Severnaya Sosva River 6 km downstream from the village Ust–Manya. The studied deposits are represented by black clays, siliceous siltstones, flakes, siliceous sandstones, massive, thick- and thin-layered, and combined into six rock packs. 57 oriented rock samples were selected from this outcrop with thickness of 27 m, from which 138 cube samples (57 stratigraphic levels) were made. The studied deposits differ significantly in magnetic properties. According to the magnitude of the magnetic susceptibility (K), a three-membered division of the outcrop is observed. The highest values of this parameter are characterized by black clays (pack 1). Here the magnetic susceptibility varies within 7.9–14.5*10^{-5} SI units. The lowest values of the K are characterized by siliceous siltstones and flanks (packs 2 and 3), the values of which are 1.0–4.2*10^{-5} SI units. Siliceous sandstones massive, thick- and thin-layered (packs 4, 5, 6) have magnetic susceptibility from 2.5 to 9.2*10^{-5} SI units. Natural remanent magnetization (NRM) vary from 0.05 to 8.40 mA/m. The highest NRM are observed in black clays (pack 1). Measured parameters included magnetic susceptibility its temperature dependence and anisotropy (AMS), as well as natural remanent magnetization. The Koenigsberger ratio was determined as, (Qn=Jn/(KH_T). To determine the magnetic minerals, an analysis of the dependence of magnetic susceptibility on temperature was used. This analysis showed that the rocks contain pyrite and siderite. These minerals not being carriers of magnetization, serve as supplier to sedimentary rocks of magnetic formations (goethite, hydrogoethite and other magnetic formations).The studied rocks have a low degree of anisotropy, these are practically isotropic – the magnetic texture of these sediments corresponds to the primary texture of sediments. The samples were subjected to stepwise thermal and alternated field (AF) demagnetizations. The AF demagnetization was the most efficient for samples of pack 1 (black clays) and revealed unstable (low coercivity) and stable (high coercivity) NRM components. The low-coercivity component be removed by a low field of 20–30 mT, while that of high coercivity, which we consider as the characteristic magnetization (ChRM), held till 60-100 mT. Thermal demagnetization was carried out up to 350-400-600°C for packs 2-6. During stepwise thermal demagnetization, two components of magnetization low-temperature and high-temperature are also identified. The primary origin of the revealed ChRM component is supported by two main lines of evidence: (i) the presence of samples of normal and reverse polarity in the section: (ii) the independence of polarity from the lithological composition of sediments. Based on ChRM component, paleomagnetic section of Cretaceous sediments was constructed. Two zones of normal *N*K_1al_2 and reverse *R*K_2cp_1, polarities were isolated in paleomagnetic section. The Early-Middle Campanian age of the rocks of packs 2–6 and the reverse polarity of these deposits, identified in the *R*K_2cp_1 zone. Underlying zone *R*K_2cp_1 are zone normal polarity of pack 1 identified in the zone *N* K_1al_2 . The zone of reverse polarity *R*K_2cp_1 is corresponding with Chron C33r of the global magnetic polarity scale, the zone of normal polarity *N*K_1al_2 is corresponding with Chron C34 of this scale. This magnetostratigraphic section will be one of the fragments of the regional of magnetic polarity scale of the Upper Cretaceous for Western Siberia.