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Petromagnetic features of sediments at the Mesozoic-Cenozoic boundary: Results from the Gams section

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Abstract

The paper continues a cycle of petromagnetic investigations of epicontinental deposits at the Mesozoic-Cenozoic (K/T) boundary and is devoted to the study of the Gams section (Austria). Using thermomagnetic analysis, the following magnetic phases are identified: goethite (TC = 90-150°C), hemoilmenite (TC = 200-300°C), metallic nickel (TC = 350-360°C), magnetite and titanomagnetite (T C = 550-610°C), Fe-Ni alloy (TC = 640-660°C), and metallic iron (TC = 740-770°C). Their concentrations are determined from M (T). In all samples, ensembles of magnetic grains have similar coercivity spectra and are characterized by a high coercivity. An exception is the lower coercivity of the boundary clay layer due to grains of metallic nickel and iron. With rare exceptions, the studied sediments are anisotropic and generally possess a magnetic foliation, which indicates a terrigenous accumulation of magnetic minerals. Many samples of sandy-clayey rocks have an inverse magnetic fabric associated with the presence of acicular goethite. The values of paramagnetic and diamagnetic components in the deposits are calculated. According to the results obtained, the K/T boundary is marked by a sharp increase in the concentration of Fe hydroxides. The distribution of titanomagnetite reflects its dispersal during eruptive activity, which is better expressed in the Maastrichtian and at the base of the layer J. The along-section distribution of metallic iron, most likely of cosmic origin, is rather uniformly chaotic. The presence of nickel, most probably of impact origin, is a particularly local phenomenon as yet. The K/T boundary is not directly related to an impact event. © Pleiades Publishing, Ltd. 2008.

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