



Magnetic Properties of Different-Aged Chernozemic Soils

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We investigated the magnetic properties and degree of mineral weathering in profiles of different-aged chernozemic soils derived from a uniform parent material. In this work, layer samples of virgin leached chernozem and chernozemic soils formed on the mound of archaeological earthy monument were used. The characterization of the magnetic properties was carried out on the data of the magnetometry and differential thermomagnetic analysis. The evaluation of the weathering degree was carried out on a loss on ignition, cation exchange capacity and X-ray phase analysis on the data of the original soil samples and samples of the heavy fraction of minerals. It was found that the magnetic susceptibility enhancement in humus profiles of newly formed chernozemic soils lagged significantly behind the organic matter content enhancement. This phenomenon is associated with differences in kinetic parameters of humus formation and structural and compositional transformation of the parent material. It is not enough time of 800-900 years to form a relatively “mature” magnetic profile. These findings are well consistent with the chemical kinetic model (Boyle et al., 2010) linking the formation of the soils magnetic susceptibility with the weathering of primary Fe silicate minerals. Different-aged chernozemic soils are at the first stage of formation of a magnetic profile when it is occur an active production of secondary ferrimagnetic minerals from Fe²⁺ released by primary minerals.