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Irreversible fixation of organic components in labile interspaces as a mechanism for the chemical stabilization of clay-organic structures

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Abstract

The relationship between the fixation of organic matter into a form resistant to oxidative destruction and the actual structure of the clay component was studied in profiles of different-aged chernozemic soils of a filled fortification in the Volga Bulgaria. With the use of modern methods (X-ray phase analysis, laser diffraction granulometry, hyphenated thermal analysis-F--IR spectroscopy, adsorption-luminescence analysis, and ICP emission spectroscopy), it was shown that the formation of organic-smectite complexes with a disordered c*-axis structure is a universal and usual way for the kinetic stabilization of the system during pedogenesis under forest-steppe conditions. The main aim of the study was to experimentally substantiate this phenomenon.

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