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Structural-chemical characteristic of lignin's substances of the dispersed-carbonate and hydrometamorphosed chernozems of the permafrost-affected soils of West Transbaykal

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Abstract

The work presents the results of structural-chemical studies of the lignin substances, isolated from the dispersed-carbonate and hydrometamorphosed chernozems of the permafrost-affected soils of West Transbaykal, and also of the soil-forming plants. Because of its stability to the microbial destruction the lignin in the composition of soils can serve as the reliable molecular marker of the transformations of organic matter. The purpose of the work consisted of the establishment of regularities in a change in the chemical structure of the soils lignin depending on district special features, depths of the horizon and growing soil-forming plants. For the characteristic of samples it were used element analysis, thermogravimetry TG-DSC, IR-spectroscopy, gas-liquid chromatography-mass-spectroscopy of the nitrobenzene oxidation products, NMR-spectroscopy. Study of the composition of lignin's substances gives the possibility to establish the genesis of organic matter of the permafrost-affected soils of Transbaykal and to determine the influence of the factors of freezing and moistening on the formation of the soil horizons of steppe and forest-steppe permafrost soils. On the basis conducted investigations it is shown that in the hydrometamorphosed chernozems of the permafrost soils of West Transbaykal the processes of soil formation, which include the microbial transformation of the lignine's structure, are passed more actively than in the dispersed-carbonate chernozems. The soil-forming plants lignins of the dispersed-carbonate and hydrometamorphosed chernozems relate to the composition heterogeneous guaiacyl-syringyl-*p*-coumaric lignins or to the lignins of GSN-type.

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