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SPECTRAL PROPERTIES OF CHROMOPHORIC DISSOLVED ORGANIC MATTER IN THE CASE OF REDOX STRATIFICATION OF LAKE BOL'SHIE KHRUSLOMENY

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It is well known that dissolved organic matter (DOM) is an essential component of natural water and represents one of the largest pools of carbon in the global biosphere. The colored portion of the DOM (chromophoric dissolved organic matter, CDOM) is made up of humic substances, which are complex mixtures of heterogeneous organic compounds of biotic origin that have undergone extensive transformations. DOM plays an important role in determining the color of a watercolor and its optical properties. The concentration of the CDOM in aquatic systems is influenced by numerous factors such as soil type, climatic conditions, hydrological regime, presence of vegetation, and the development of microorganisms. The optical properties of CDOM of natural water from the stratified lake Bol'shie Khruslomeny (Oleniy Island, Kandalaksha Gulf, Murmansk Oblast, Russia) in the summer season of 2025 are studied in this work. Before CDOM spectral measurements were taken, water was filtered with nylon filters with a pore size of 0.22 μm to separate suspended particles. Absorption spectra were measured in the range from 200 *nm* to 800 *nm*. The CDOM fluorescence emission spectra were recorded using a Solar CM2203 luminescence spectrometer with a excitation wavelength varying from 250 *nm* to 500 *nm* (in 10 *nm* increments). The advantages of spectroscopic methods are that they do not require the pre-treatment of water samples and are able to rapidly obtain information on the CDOM vertical distribution along the water column. The calculation of the fluorescence quantum yield (FQY) was carried out using the method of a reference compound using the quinine sulfate solution, which was previously used for the samples of natural water and commercial humic preparations. The absorption spectra are that the highest optical density is characteristic of the bottom horizons. It is revealed that the dependences of the optical densities at the selected wavelengths on the depth of the layer have a local minimum in the region of the redox transition. The presence of "protein-like" and humic fluorescence bands is shown, and protein-like fluorescence is not manifested at all depths. The greatest amount of protein-like fluorescence is observed in layers with cryptophytic algae and layers with anoxygenic phototrophic bacteria. The dependence of FQY on the excitation wavelength is calculated, and it is shown that the nature of the dependence, as well as the absolute value of the quantum yield, are consistent with the data obtained earlier for other White Sea meromictic reservoirs. The dependences of the FQY on the sampling horizon are constructed, and it is shown that they have a minimum at the beginning of the chemocline.

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