ostec corporate group

future's in the making

Determination of oil content in water by the method of IR-Fourier spectroscopy

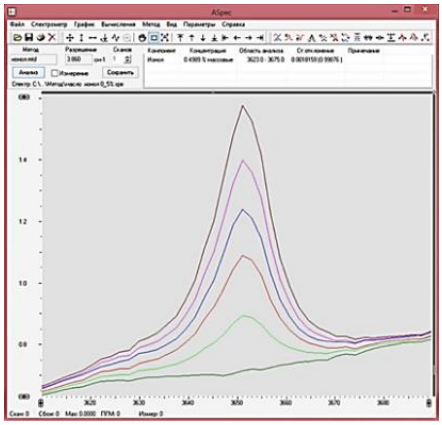
Petroleum products are among the most common and dangerous substances that pollute surface and groundwater. Despite the low solubility in water, a small amount of oil is enough to dramatically degrade the quality of water. In this regard, measures aimed at the determination of petroleum products in wastewater, as well as in river and seawaters, are of great importance.

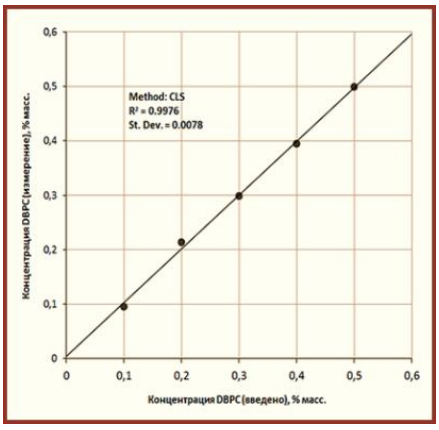
FTIR spectroscopy is an effective and efficient method for monitoring petroleum products in the aquatic environment. For quantitative determination, the extraction of petroleum products from water, mainly using tetrachlorethylene, is carried out. It is an excellent solvent for organic compounds, and has no CH groups, which makes it easy to quantify extracted organic compounds in a solution of tetrachlorethylene using the intensity of stretching vibrations of the CH bond in the target component.

Analysis of the extracts can be performed using **IROS P01** or **P02** FTIR spectrometers, which are characterized by high resolution (1 cm^{-1} for **IROS P01** and 0.5 cm^{-1} for **IROS P02**) and high signal-to-noise ratio (at least 60000:1 RMS). The optical scheme is based on a Michelson interferometer with self-compensation, which does not require dynamic alignment. The spectrometer is equipped with a solid-state DLaTGS detector. The registration of the spectra is carried out by the transmission method in liquid cells with a fixed or variable thickness.

The method is based on changing the intensity of the absorption band of stretching vibrations of the CH groups in 2800–3200 cm^{-1} range.

The obtained IR spectra are processed in the **IROS Software** package (the basic software supplied with the spectrometer), as well as the special software module **PAspec,** which allows to construct and verify calibration models using the multidimensional method of classical least squares.





Software is compatible with OS Windows XP/Vista/7/10 and can handle *.spe, *.spc, *.dx, *.asc IR spectra file formats

Recommended configuration:

IROS P01 FTIR spectrometer:

Range: 370–7800 cm^{-1}

Resolution: 1 cm^{-1}

Cube corner Michelson interferometer

IROS Software

Multi-purpose cell and sample holder for **IROS Pxx**

Demountable liquid cell for **IROS Pxx,** spacer set 0.1–1 mm, CaF_2, KBr or ZnSe windows

IROS PASpec – quantitative analysis of IR spectra, multivariate methods

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