From factors of regress of the equation after calculation of a confidential interval (Δbi = 1,55) have established, that to the major factors influencing process, the concentration of the extract, duration of extraction and degree of crushing of raw material concern. The statistical analysis (F_{exp} = 3,7 < F_{tab} = 4,1) has shown, that the mathematical model is adequate. Under the quantitative contribution factors settle down in the following order:$X_2 > X_4 > X_1 > X_3 > X_5$. The yield at the first contact of phases has made 60,5 % that is quite comprehensible. Thus, the output of the sum of iridoids has increased for 3,8 % from the maintenance of raw material.

DETERMINATION OF THE ADSORPTION CHARACTERISTICS OF DOLOMITE IN THE OIL–SURFACTANT–WATER SYSTEM

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Pollution of reservoirs with oil and associated oil industry waste is an acute environmental problem in many regions of Kazakhstan. Petroleum products are one of the most common anthropogenic pollutants of surface reservoirs. The extraction, processing and transportation of oil are accompanied by the fact that a certain amount of oil waste and petroleum products enters the water. They pollute the environment as a result of artificial accidents, the discharge of untreated oily water [1].

Conventional flooding often leads to unsuccessful oil production since most of the injected water tends to be directed to more permeable zones [2].

As a result of the analysis of scientific and technical literature, it wasfound that along with the use of organic, inorganic and synthetic sorption materials of various compositions for the elimination of oil residues, surfactants have also been widely used [3-4].

The process of adsorption wastewater treatment using a dolomite sorbent and a surfactant of diisobutyl dithiophosphate composition is considered.

To study the sorption properties of dolomite in the treatment of wastewater contaminated with oil, model solutions were prepared in the composition of gasoline: oil: water in the ratio of components (1:2:50) with a total volume of 5 litres, followed by separation into ten fractions. The method of sample analysis is based on the following stages: 1) preparation of the mixture, 2) mixing with a magnetic stirrer; 3) pretreatment by double filtration; 4) cleaning with a dolomite sorbent calculated at 1 gram per 50 ml; 5) thermal decomposition of the aqueous extract, through a reverse Dimroth refrigerator, in order to determine chemical oxygen consumption (COD) by the method [5]. Based on the COD results obtained, the adsorption capacity of the dolomite sorbent was calculated taking

into account which the Freundlich adsorption model was determined. According to the experimentally obtained dependence of oil adsorption on the sorbent surface, adsorption isotherms for dolomite in the water–oil–surfactant system were modelled, the results of which are presented in figures 1-2. The experimental dependence of the adsorption processes was considered in static mode with a change in time (from 1800 to 5400 seconds) under constant stirring conditions (4.2 rpm/sec).

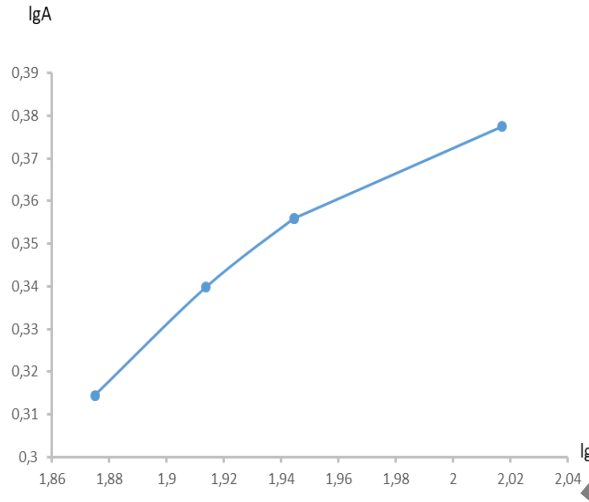

Figure 1. Adsorption isotherm for dolomite in the water–oil–surfactant system (thionocarbamate and diisobutyl dithiophosphate (70:30)).

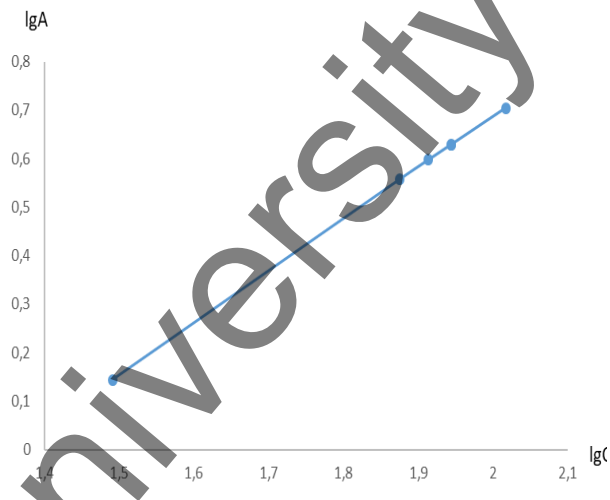

Figure 2. Experimental data on oil adsorption on dolomite (water – oil – surfactant (diisobutyl dithiophosphate)) in the coordinates of the linear Freundlich equation

Based on the data, it was found that the sorption process of wastewater treatment with a dolomite sorbent using surfactant diisobutyl dithiophosphate ($C_8H_{18}O_2PS2Na$) is determined by the Freundlich equation (Fig.2), which indicates the formation of a monomolecular layer on the surface of the adsorbate due to the presence of activation centers with identically equal energy and enthalpy. Which is more characteristic of physical adsorption by Van der Waals forces due to the negative value of the constant of the Frendlich equation. In the case of the use of surfactants, thionocarbamate - diisobutyl dithiophosphate (70:30) ($(CH_3)_2CHOC(S)NHC_2H_5$:$C_8H_{18}O_2PS_2Na$) (Fig.1) the adsorption process is described by Freundlich's theory, which is characteristic of the energy occupancy of active sorption centers, with intensive “adsorbent-adsorbate” interaction. Based on the obtained slope of the curve, the constant of the equation k = -0.00025 is calculated.

Using the equation of the Dubinin-Radushkevich model [6]:

$$E=(-2k)^{-0.5}$$

the values of the activation energy E=44.72 kJ/mol are calculated.

According to the data, it can be concluded that adsorption on a dolomite sorbent with a collector additive of thionocarbamate - diisobutyl dithiophosphate ($(CH_3)_2CHOC(S)NHC_2H_5$:$C_8H_{18}O_2PS_2Na$)) occurs due to intermolecular interactions on the near-surface layer of dolomite and has more of a chemical character.

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MICROSTRUCTURAL ANALYSIS OF POROUS MEDIA IN PACKED BEDS OF NON-SPHERICAL PARTICLES

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Abstract. Chemical reactions, adsorption, rectification, and many other processes are often performed in the industry using packed beds of cylindrical and spherical particles. The fraction of free space in a packing of particles, known as the void