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Research Article

ECOLOGICAL ISSUES OF THE SAFETY OF OIL AND OIL PRODUCTS WASTE DISPOSAL

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ABSTRACT

Oil and gas are the main energy resources that play a key role in the economies of all developed countries of the world. The products of their processing are used in almost all industries, in all types of transport, in construction, agriculture, energy, everyday life, etc. Also, a variety of chemical materials, plastics, synthetic fibres, rubbers, etc. are produced from oil and gas in large quantities. varnishes, paints, detergents, mineral fertilizers and much more. The use of oil and gas determines the level of economic development and life of modern man.

KEYWORDS

Oil sludge, recycling, methods, pollution, equipment, oil refining waste.

INTRODUCTION

In our world, one of the most pressing problems is the processing of oil sludge that has accumulated in the oil traps of oil refineries. Accumulated oil sludge leads to contamination of soil and vegetation cover, soil erosion, desertification and, as a consequence, a decrease in the land fund and its simplification, as well as local deterioration of ecosystems. At the moment, oil refineries do not process accumulated oil sludge, so

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processing and obtaining a secondary product from oil sludge of impregnating construction bitumen is an urgent problem [1].

As a result of oil production, transportation, processing and storage, oil waste - oil sludge - is formed. Every year, reserves of oil sludge increase and accumulate in specially built storage facilities, occupying vast territories and causing great environmental damage. The article is devoted to an analysis of the sources of oil pollution and their impact on the components of the natural environment. A review of existing thermal methods for treating hydrocarbon-containing waste is provided. The main advantages and disadvantages inherent in the considered methods are noted. Modern installations and developments aimed at improving the processing of waste petroleum products are analyzed. The most promising method for neutralizing carbon-containing waste has been established. The obtained result can be used by oil refining and oil production enterprises to create a more efficient technology for recycling waste oil products and related equipment.

The energy direction in the use of oil still remains the main one throughout the world. Oil and natural gas are also irreplaceable sources of energy; they have a high calorific value and are cheap compared to other types of fuel. Sources of oil pollution. With the development of technology, oil consumption is increasing. About 400 million tons of oil are produced annually in Russia [2], of which from 1.5% to 10% (4.5% million tons per year) are lost during production and transportation, leading to catastrophic environmental pollution [3].

The republic has achieved certain theoretical and practical results in the field of recycling and production of secondary products, and raw materials from oil sludge for construction, chemical and automotive industries. The action strategy for the further development of the Republic of Uzbekistan provides for the tasks of "raising industry by transferring it to a qualitatively new level, further intensifying the production of finished products based on deep processing of local raw materials, mastering the production of new types of products and technologies." In this area, among other things, scientific research on the utilization of hydrocarbon waste and the creation of an energy-saving technological line for obtaining a secondary product from oil sludge are important [4].

Recycling of oil sludge generated at oil refineries and development of new waste-free technology for producing construction bitumen.

Determination of the concentration of water and fine solid particles in the composition of the studied oil sludge;

determination of the amount of light fractions in the composition of the diluted test oil sludge;

development of a technological line for producing construction bitumen from oil sludge;

We produce gasoline in a container for mixing oil sludge to dissolve both particles.

After which the container was mixed with a rotary mixer, then the raw material was sent to a hydrocyclone using a centrifugal pump, and in the hydrocyclone it was separated into two parts, light and heavy. The heavy ones are sent to waste, the light ones are sent to the semi-finished product and after the hydrocyclone goes to the distillation column.

When hydrocarbon feedstock enters the distillation column, it undergoes a single evaporation, resulting in the formation of an equilibrium vapour-liquid mixture.

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The resulting upward flow of a mixture of hydrocarbon vapours and stripping agent from the cube rises up the column and sequentially passes through all the contact plates located in its exhaust and reinforcing parts.

According to [5,6], four nonequilibrium flows pass through each mass transfer plate of the column: liquid flowing from the upper plate; vapours coming from the lower plate; liquid draining onto the underlying plate along the overflow plate and vapours evaporated from the composition of the liquid in the plate rising to the overlying plate.

The hydrocarbon feedstock heated to 305-345 C in a vapor-liquid state enters the feed plate of the distillation column, and the stripping agent with a temperature of 270-275 C is supplied to the bottom of the column cube using the open method. If necessary, the operating temperature of the raw materials in the cube can be raised using an electric heater.

During the process, liquid from the upper plate flows into the lower plate along the overflow plate, where the temperature of the process is higher. Therefore, part of the low-boiling fractions evaporates from the liquid, forming a flow of vapours, as a result of which the concentration of the latter in the liquid composition decreases. On the other hand, rising vapours from the lower plate fall on the overlying plate, where the temperature regime is lower than in the lower plate. In this case, part of the high-boiling fractions from the steam condenses on the upper plate, passing into the liquid phase.

In its most simplified form, oil sludges are multicomponent stable aggregative physicochemical systems, consisting mainly of petroleum products, water and mineral additives (sand, clay, metal oxides, etc.) [5,7]. The main reason for the formation of oil sludge is the physical and chemical interaction of oil products in the volume of a specific oil-receiving device with moisture, atmospheric oxygen and mechanical impurities. As a result of such processes, partial oxidation of the original petroleum products occurs with the formation of resin-like compounds. The penetration of moisture and mechanical impurities into the petroleum product leads to the formation of water-oil emulsions and mineral dispersions. Since any sludge is formed as a result of interaction with an environment specific in its conditions and over a certain period of time, there are no sludges identical in composition and physical and chemical characteristics in nature [8].

Physico-chemical and thermophysical properties of a mixture of oil sludge with gasoline and their fractions obtained by distillation.

In the periodic operating mode of the installation, with the sequential production of distillates of fuel fractions, first gasoline fractions, and then kerosene and diesel fuel. In subsequent experiments, the distillation of raw materials was carried out in a continuous installation mode, with degassing of the resulting distillates of kerosene and diesel fuel fractions in a stripping column.

Thus, based on the research carried out on the dilution of oil sludge, the following conclusions can be drawn: the output is at the beginning of the dissolution of oil sludge, we distil the gasoline fraction and a residue will remain, and after the deasphalting process, it is possible to obtain bitumen products from oil sludge.

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