TECHNOLOGY OF CHEMICAL DEHYDRATION AND HEAT-CHEMICAL EMULSION OF OIL.

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Annotation

The quality of petroleum products is due to the use of modern technologies in cleaning it from various components. The article explores the application of thermal and chemical methods used in oil refining, the conduct of the refining process, the practical application in the fields of our republic.

Key words: *dehydration, reagents, chemical methods, deemulgators, deemulsification, fractionation.*

ТЕХНОЛОГИЯ ХИМИЧЕСКОГО ОБЕЗВОЖИВАНИЯ И ТЕПЛОХИМИЧЕСКОЙ ЭМУЛЬСИИ НЕФТИ

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Аннотация

Качество нефтепродуктов обусловлено применением современных технологий при их очистке от различных компонентов. В статье изучается информация о применяемых при очистке нефти тепловых и химических методах, процессе очистки, применяемых на месторождениях республики.

Ключевые слова: *обезвоживание, реагенты, химические методы, деэмульгаторы, деэмульгация, фракционирование.*

In the oil industry, chemical methods are widely used in oil dehydration, which is based on the decomposition of an emulsion using chemical reagents. The effectiveness of chemical dehydration will depend to a large extent on the property of the reagents used [1,2]. The choice of reagent-deemul'gators will in turn depend on the water-oil emulsion, the property of the oil, the emulsion to be lowered. To break down the emulsion, a reagent-deemul'gator is introduced and mixed with it, after which conditions are created for the release of water from the oil through the precipitate. A method of continuous decomposition of the periodic state or emulsion is used. It is often preferable to use a continuous process.

There are 3 chemical methods of oil dehydration.

1. Pavement deemulsion-dehydration will be based on deemulsion, and it is carried out in an oil harvesting pipeline transmission. In this case, a reagent is introduced into the starting part of the oil collection collector.

2. Intra-borehole deemulsion-dehydration will be based on deemulsion, and reagents are injected and carried out directly into the pipe.

3. Deemulsion and oil dewatering are carried out directly in the incinerating reservoirs. In this case, the reagent is introduced into the reservoir filled with the emulsion and lowered into the processing.

Hot-chemical processes reduce or completely break down the strength of Iron Curtain coatings and accelerate the separation of thick oil emulsion and make it cheaper.

Currently, more oil is transferred from a hot-chemical treatment device. The reason for the many applications of such processing is the use of equipment and apparatus, and the possibility of oil treatment using waters of different composition, simplicity of construction, the possibility of replacing deemul'gators depending on the property of the penetrating emulsion [3]. In combination with this, there are also a number of disadvantages of hot-chemical methods. Deemul'gators have a higher movement and an increase in heat consumption. In practice, the processes of oil dehydration and desalination are carried out at a temperature of 50-100ºC. Used demulators poured onto emulsified oils, divided into electrolytes, non-electrolytes and colloids.

Demulsifiers-electrolytes are divided into organic and mineral acids: acetic acid; sulfur and salt; alkalis and salts; table salt; iron chlorite; aluminum compounds, etc. Electrolytes may also form deposits insoluble in the salt emulsion. Reduces the stability of iron curtains or the destructive properties of emulsifiers for the destruction of iron coatings. Electrolytes, like demulsifiers, can be used in limited conditions due to their high price or significant corrosiveness to metal equipment.

Non-electrolytes are organic substances and have the ability to melt iron shells and reduce the viscosity of oil. Such demulsifiers include gasoline, acetone, alcohol, benzene, four carbon dioxide oxides, phenol and others.

The production of non-electrolytes in industry is not used due to high prices. Demulsifiers - colloids - surfactants, which, when emulsified, destroy the shells of vessels or weaken their protection.

Surfactants are divided into anionfol, cotionfol, non-ionogen. Anionic surfactants dissociate the negative charges of the ions of the corbon-active part and positively charged metals or hydrogen ions in aqueous solutions. This group includes corbonate acids and their salts, sulfuric acids, alkulsulfonates and others. Cationic surfactants break down into positively charged radicals in aqueous solutions and residues of negatively charged acid.

Surfactants such as demulsifiers are used industrially. Nonionic Surfactants do not break down into ions in aqueous solutions. This group includes oxylated alkylphenols (demulsifiers,,,,,, etc.) and oxylated organic substances consisting of mobile hydrogen atoms (diproxamine 157, proxamine 385, proxanol 305, etc.) [4]. Demulsifiers should dissolve well in the emulsion phase (in water and oil) and be hydrophilic and hydrophobic, have a surface activity sufficient to destroy ferruginous shells, inert to metals, do not impair the properties of oil, be cheap and provide universal compared to emulsions and have a decomposing character.

The faster the demulsifier is introduced into the mixture of water and oil, the faster the emulsion decomposes. For complete contact with the emulsion to be treated, heating of the accelerated turbulence and emulsion is achieved. Thermochemical methods of splitting oil and water emulsions are widely used in the fields. This method has a number of advantages and allows you to replace demulsifiers without replacing equipment and apparatus. that water does not affect the regime, and also has a number of drawbacks in thermochemical methods. losses due to high costs for demulsifiers, evaporation of light fractions in large quantities in pressurized tanks, excess heat consumption, negative environmental impact and hackoses. The implementation of the thermochemical method includes devices operating under atmospheric and overpressure.

The device operating under the atmosphere is most often used in the oil industry. The oil emulsion freed from gas at the field is collected in the tank (4) through collection headers, from where the pump (3) is supplied to the product tank through the superheater (2) (Fig. 1).

When oil enters the heater, a demulsifier is added to the emulsion, and in some cases, water supplied to the recirculation. The demulsifier is supplied by a metering pump, uniform oil supply is controlled and ensured. The demulsifier is dosed and counted using meters, but subsequently all these meters are replaced by automatic flow control devices.

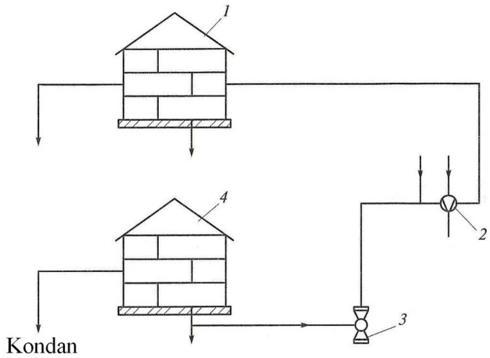

Fig. 1 Process flow diagram of the thermochemical plant (without pressure): 1-commodity reservoir; 2-steam heater; 3-pump; 4-raw material reservoir.

Mixing and dispensing demulsifiers with an oil emulsion is highly dependent on the effectiveness of the emulsion, and accurate pressure differentials must be maintained in the mixers to ensure classification of the emulsions produced for each oil.

In order to reduce the fuel consumption for heating oil emulsions, introduce a given temperature into the dehydration and desalination processes and reduce the loss of light fractions during stagnation of the emulsion in tanks, these processes are carried out under increased pressure [5].

The quality of use of these devices increases when pressure dehydration and desalination are carried out at hermetized capacities.

The advantages of hermetically sealed capacity include:

- it is possible to completely eliminate the loss of light fractions in which an oil-based emulsion is infused under pressure of 10 kgs/sm^2 at hermetized capacities;
- due to the sharp decrease in viscosity when the temperature of the working emulsion rises to 150ºC, the tinting
 time is reduced from 1 to 3 hours, the strength of the protective layer of the globule of the emulsified water is reduced, the property of absorbing the chemicals (deemul'gators) included in them is increased, and the latest consumption is reduced;
- the Heat spent on heating the emulsion is reduced due to the fact that the main part of the heat in the oil flows is regenerated.
- there is the possibility of large-scale control of the mode of the emulsion, which has different solubility and durability at the expense of increasing the durability and reliability of carrying out processes.

The principle scheme of a technological device operating under pressure is shown in Figure 2.6. Oil is collected from the field into a reservoir of raw materials (7), from where it is transferred using a pump (6) to a heat exchanger (5). Oil can also enter raw.

Due to the heat entering the heat exchangers, the product heats the incoming oil and cools to 45..40ºC for the first time. The heated 35..65ºC gacha oil is re-supplied to the superheater (4), the temperature is increased (70..150ºC) in accordance with the process conditions.

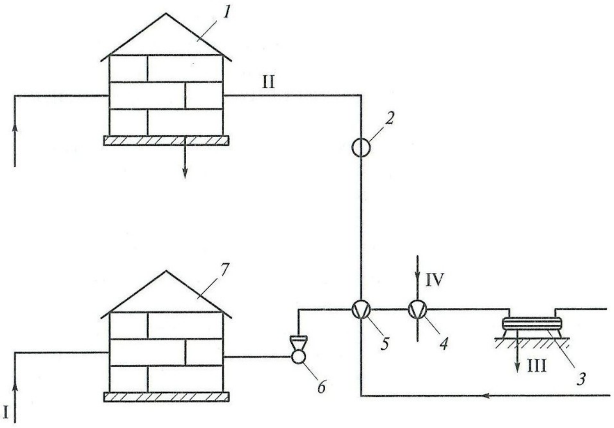

Figure 2.6. Process Flow Diagram of Thermochemical Units (Pressurized):
1-commodity reservoir; 2-refrigerant; 3-clarifier; 4-Steam heater; 5-heat exchanger; 6-pump; 7-raw material reservoir;
I-crude oil; II-dehydrated oil; III-layer water; IV-water vapor.

Prior to heat supply to the heat exchanger in heat-chemical plants during pressure testing under atmospheric pressure, an emulsifier or water impregnated in recirculation is introduced into the oil. If the device operates in the desalination mode on two stages, in addition to the demulsifier, heated fresh water is introduced into the oil before reloading, therefore, a special heating and a water unit for the cycle are previously provided on the unit.

The oil is heated to the required temperature and treated with a deemul'gator, collected in a clarifier (3) (horizontal, upright or spherical), followed by 1..For 3 hours, the layer water is separated. At the latest, it is taken out of the tin. The dehydrated crude oil is fed into a batch heat exchanger, with the incoming oil being released into the unit (1) in the commodity reservoir, giving it its heat. If the temperature of the oil is above the norm, the oil is cooled in special group water coolers (2) after a heat exchanger in commodity reservoirs to limit the loss of light fractions.

Thermally chemically desalination processes are also not common in independent oil extraction and refining.

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