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RESEARCH IN DEWAXING OF THE RAFFINATE 3RD OIL CHASE AND DEOILING OF GATCH WITH PURPOSE OF GETTING TECHNICAL PARAFFIN

LIZAVETA KHODIKOVA, IRINA BURAYA
Polotsk State University, Belarus

The article describes a method of processing the third raffinate oil distillate followed by using intermediate gatch, for the purpose of obtaining technical paraffin.

It is well known that the lube oil unit of a modern refinery plant is one of the most expensive units at the refinery on costs of manufacturing and operational costs. One of the problems of lube units is efficient use of by-products of the dewaxing (slack wax and petrolatum), which are not often used as a commercial product due to the poor quality and low profitability.

The application of slack wax of dewaxing process and petrolatum (petroleum waxes) in production processes of paraffins and ceresin allows to get special composition, which find wide application in various industries and agriculture.

Paraffins and microcrystalline wax are used as coating and impregnation of various materials such as paper, cardboard, particle board, ceramic products, in the processing of crops and foods and so on. They give surfaces smoothness and sheen, water repellent and waterproof properties. Paraffins are widely used in medicine and cosmetics; they are also valuable products in the oil refinery. Price per tonne of paraffin increases depending on the content of the oil in it, which makes it profitable to produce this product in the manufacture [1].

Selection of the method. For obtaining technical paraffin mark T-3 was chosen method of solvent deparaffination by using solvents MEK (methylethyl ketone) and toluene with subsequent gatch slack wax obtained by de-oiling. The instalation of solvent dewaxing is functioning at the plant OJSC (Open Joint-stock Company) "Naftan" with use of MEK and toluene as solvents

As raw-material the third raffinate oil distillate after selective purification has been selected.

Carrying out the dewaxing. For obtaining slack wax, raw material for production of paraffin, it is required to conduct solvent dewaxing using toluene and MEK. At first the necessary amount of raw material is taken, after that the raw material is mixed with solvent in a ratio of 1: 3 (vol.). The obtained mixture is heated up to a predetermined temperature to remove the "germ" of high melting crystals, then the mixture is cooled down to filtration temperature [2].

The mixture is filtered through a vacuum filter. On the filter a "flapjack" remains, it is a slack wax, which is the raw material for producing the paraffin. The "flapjack" is washed with solvents and sent to deoiling.

After the filtration obtained the filtrate is sent to solvent recovery, where dewaxed oil is also obtained.

Carrying out deoiling. Deoiling process is not different from the dewaxing process either by equipment design or process flowsheet, although the process of deoiling has some differences, for example, heating and cooling temperatures are lower than the dewaxing, multiplicity solvent: feed 6 (8): 1 (vol.).

The product of deoiling is crude wax, which is sent to hydrofining.

Analysis of results. After the deoiling it is necessary to determine the oil content in paraffin and its melting point for assigning a certain class clearing and mark of the paraffin.

The results obtained in the course of the analysis are shown in the table 1.

Table 1

Parameters	Values
Appearance	White crystalline mass, shades of gray or yellow are acceptable
Melting point, °C	53
Oil content,% wt.	2,8

We see from these results that this paraffin gratifies a technical paraffin mark T-3 [4]. The obtained paraffin is valuable for the petrochemical and chemical industries as a necessary component for manufacturing of various products, is a part of anti-corrosion and impregnating coating.

Conclusion.

During the analysis of the literature and results of the study research the following was established:

- The obtained paraffin complies with and conforms to the technical paraffin mark T-3;
- The resulting paraffin meets the requirements of the petrochemical and chemical industry;
- This research has a practical orientation as it may be realized in practice.

Industrial istallation of the dewaxing includes: heating units of raw-material, filtration, solvent recovery from dewaxed oil solution, the regeneration solution slack solvent, separation of water from the solvent [5]. For production of technical paraffin modernization of solvent recovery unit is offered, namely:

1) an extra stripper for technical paraffin;
2) an extra column for evaporating technical paraffin [6].

REFERENCES

1. Ахметов, С.А. Технология глубокой переработки нефти и газа : учеб. пособие / С.А. Ахметов. – Уфа : Гилем, 2002. – 672 с.
2. Покровская, С.В. Технология переработки нефти и газа. Производство нефтяных масел : учеб.-метод. комплекс / С.В. Покровская. – Новополоцк : ПГУ, 2008. – 320 с.
3. Практикум по технологии переработки нефти : учеб. пособие для студентов химико-технолгических специ-альностей вузов / Е.В. Смидович [и др.] ; под ред.: Е.В. Смидович, И.П. Лукашевич. – М. : Химиия, 1978. – 285 с.
4. Парафины нефтяные твердые. Технические условия : ГОСТ 23683-89. – Введ. 1998-01-01. – М. : Изд-во стандартов, 1998. – 14 с.
5. Ходикова, Е.А. Исследование депарафинизации рафината 3-го вакуумного погона и обезмасливания гача с целью получения технического парафина / Е.А. Ходикова // Труды молодых специалистов Полоцкого государственного университета. – 2016.– № 72 : Технические науки. – С. 200.
6. Ходикова, Е.А. Интенсификация процессов депарафинизации и обезмасливания / Е.А. Ходикова // Труды молодых специалистов Полоцкого государственного университета. – 2016. – № 72 : Технические науки. – С. 202.