TECHNICAL SCIENCES

CONTROL OF THE GRADUAL COKING PROCESS

Aliev N.,
Student
Azerbaijan State Oil and Industry University
Maharramova T.
Associate professor
Azerbaijan State Oil and Industry University
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Abstract

At present, the policy of producing oil fractions around the world is an urgent need. In this regard, the rapid world economy development at the same time, causes its dependence on oil. At such a time, the most pressing issue is the correct and efficient resulting crude oil processing [1÷4]. Taking into account energy efficiency, certain requirements are imposed to improve the quality indicators of the obtained oil fractions [5, 6]. Given the need for petroleum coke, the such a technological process control is a very important issue.

Keywords: coking process, technological process, oil fractions, petroleum coke, quality indicators.

Heavy oil fractions are used in unheated chambers in the technological process for producing petroleum coke. In other plants, coke, dry gas, coke oven gasoline and a heating oil component can be used to produce light gas oil, a heavy gas oil boiler fuel component, as well as a stable liquid product [7].

In the technological gradual coking process, the distillation section is single-flow, and the coke chamber section is double-flow.

The technological gradual coking process operates in two modes:

1) continuous mode - according to the raw materials supply,

2) periodic mode of operation - due to the coke release.

Blocks and technological compartments on the installation are as follows:

• raw material - tar heating unit,

• site for coking raw materials and distillation of coking products,

• coke purge unit, cooling and product retention,

• block of gasoline alkalization,

• unit for alkalization of light gas oil fraction in the technological coking process,

• pump cooling unit,

• unit for utilization of waste gases and oil products,

• water treatment unit for coke cutting,

• raw coke storage, coke silos, coke separation and coke transportation,

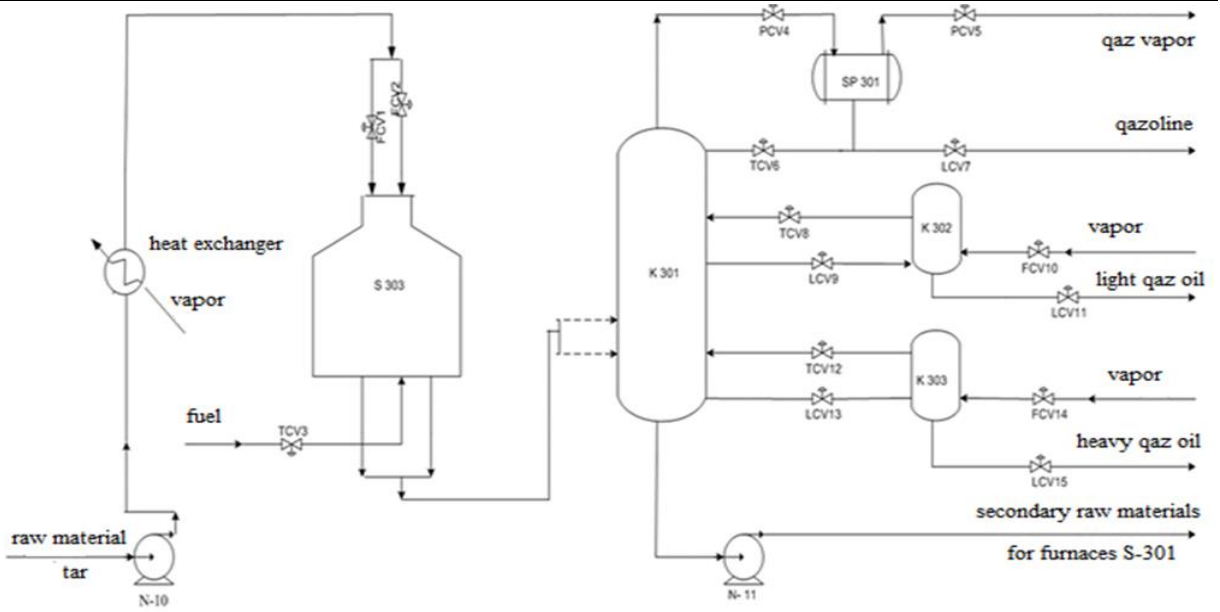
• coke storage.

Raw material - tar enters the gradual coking unit from tanks. It is then pumped through the pumps in parallel flow to the heat exchangers. Here the resin changes its temperature from the heavy gas oil heat. The heated resin again enters the S-303 furnace in two streams. The tar flow rate at the entrance to this furnace is regulated by flows. The overall temperatures at the gas pipeline outlet of the furnace are also regulated. The raw material supplied to the furnace in two streams is combined by one stream at the furnace outlet and enters the K-301 boiler.

At the top of the distillation column, gasoline, water vapor, oil gas are cooled, passing through water and air coolers. Further, these products enter the Sp-301 separator. Here the temperature is controlled and the separation process of incoming products from each other takes place. The gasoline level in the separator is controlled by a level regulator on the discharge line. Part of the coking gasoline is taken from the gas separator by pumps and fed to the upper part of the K-301 boiler for irrigation. Further, light gas oil (180÷350 °C) from the boiler K-301 enters the evaporator of the boiler K-302 with its own flow. Light ends gas oil levels are controlled by a regulator in the discharge line. Here, the fraction contains low-boiling products, which are evaporated using heated high-temperature water. Part of the obtained fraction is returned to column K-301 from the top of column K-302. The flow steam rate supplied to the K-302 boiler is maintained constant with the help of an appropriate flow controller.

Theproduct level in this tank is controlled by a level controller installed in the light gas oil outlet line. From the bottom of the K-301 tank, heavy gas oils flow with their flows into the K-303 tank, and the heavy gas oil level is regulated by a regulator installed on the line. Steam is injected into the K-303 boiler, and the flow this steam rate is maintained constant by means of a flow controller installed on this line. Part of the fraction in the K-303 column is heated at high temperature and returned to the distillation column K-301. The returned product temperature is controlled by appropriate switches.

The tar heating process technological scheme is shown in Pic. 1.



Pic. 1. The tar heating process technological scheme

The coking oil products technological process is carried out at the coking unit. In the coke chambers the pressure is maintained - 6 kg/cm2 (0.6 MPa), temperature - 450÷500 °C.

The technological process of coking according to the radical mechanism is the parallel-sequential reactions sum. Technically, the coking target oil products process is more profitable from an economic point of view and allows increasing oil fractions.

In the technological process of obtaining coke, the target product, coke, is obtained after several intermediate compounds.

The main advantage of the process is that the coking process is carried out due to the heat continuous accumulation of the raw material preheated to 495÷520 °C in the chambers, where isolated coke enters from the outside. Light gas oil is injected into the chambers at a temperature of 515÷520 °C, which ensures the correct coking process.

The following parameters are kept constant at coking units:

1) excess pressure in the upper part of the chamber - 1.5÷4.0 kg/sm^2 (0.15÷0.4 MPa),

2) the raw material temperature at the outlet of the furnace - 495÷520 °C,

3) recirculation coefficient - 1.2÷1.8.

An increase in overpressure, feed temperature, and recirculation ratio in the system leads to an increase in the yield of gas, gasoline, coke, and light gas oil and a decrease in the heavy gas oil yield.

The smart meters are compared with the parameters units. The coking technological process uses high-quality, internationally standardized and efficient intelligent devices that provide measurement and control of flow, temperature, level and pressure in the distillation column.

When finding the regression equation coefficients, the question arises of ensuring optimal operation in the distillation column. The most efficient system chosen becomes the optimal control system. At this time, the system operation is determined by the conditions for limiting technological parameters during regulation. To do this, it is necessary to determine the optimality criteria that provide the technical and economic indicators of the system. In this case, the optimality criteria are also called system performance indicators. The optimality criterion provides the objective function. The optimal values of the input-output and control parameters for the distillation column are calculated. The optimal values of the obtained parameters were compared with their real values, and the obtained optimal values were more cost-effective and created conditions for saving financial resources allocated to the technological process.

Thus, as a result of gradual coking process optimal control, an improvement in the quality indicators of the fractions obtained in the oil refining process, an increase in efficiency, the delays elimination in the system during the process, and a reduction in losses are achieved.

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THE İNFLUENCE AND ROLE OF İNFORMATİON AND COMMUNİCATİON TECHNOLOGİES İN THE DEVELOPMENT OF EDUCATİON

Aliyeva G.
Teacher of Sheki branch of ADPU
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Abstract

The role of information and communication technologies used in education is discussed in the research work. These ICT tools play an extremely important role in the development of society. One of the possibilities of using ICT in the current period is education. At almost every stage of the learner's development, ICT is definitely used.The "Program for provision of general education schools in the Republic of Azerbaijan with information and communication technologies (2005-2007)" approved by the President of the Republic of Azerbaijan Mr. Ilham Aliyev on August 21, 2004, started this process in our country. After that, the "State Program for Informatization of the Education System in the Republic of Azerbaijan in 2008-2012", adopted by the head of the country on June 10, 2008, aims to establish a qualitatively new education model in our country in accordance with international standards using ICT, a single electronic education space. set the main goal of creating and integrating the education system into the world education space.

The main goals related to the informatization of the education system have already been defined, and a large number of planned measures have been implemented. One of the significant events is that the Ministry of Education of the Republic of Azerbaijan declared 2010 as the "Year of ICT in Education" in our country, and within the framework of this campaign, conferences, seminars, various stimulating and motivating actions, competitions are held. It is commendable that various funds, companies and firms are closely involved in these works. Supplying schools with ICT equipment, including computers, laptops, and interactive boards, is currently being successfully continued.

Keywords: information, communication, technology, knowledge, teacher-student unity.

Relevance of the topic: The 21st century consists of a digital world, and information and communication technologies (ICT) are used in all areas of this world. In modern times, the development of information and communication technologies (ICT) is one of the important indicators of the intellectual and scientific potential of every country, and the necessity of this process is more felt in the current globalization era. The rapid development and spread of these technologies creates wide opportunities for the development of mankind. We know that information technology is changing day by day and developing rapidly. These technologies require future professionals to be flexible and constantly ready to adapt to this technology. The rapid development of computer technology from year to year allows us to conclude that From the beginning of the 21st century, information storage in all developed countries will be based only on paperless technology. Informatics is the science of information transformation, based on the use of computing techniques, and provides knowledge about the creation and operation of information systems. This knowledge connects the collection, processing, transmission and use of information with the application of computing techniques. The application of computing techniques, in turn, involves new man-machine technology. The role of information technologies in the process of economic management is irreplaceable. Informatics as a field of science can realize its possibilities after the information model of the studied phenomenon is established. Informatics develops the general methodological principles of building this model.

Interpretation of the research: Today, as the world economy takes a line of development based on knowledge, it requires the establishment of a system that meets these requirements from the educational systems of the countries. Therefore, it is required to develop not only the mechanisms that meet the socio-economic requirements of the country, but also the mechanisms that meet the competition of the global world as a whole. Serious and successful steps have been taken in the field of informatization in our republic. National leader Heydar Aliyev approved the "National Strategy on Information and Communication Technologies for the Development of the Republic of Azerbaijan (2003-2012)" on the wide application and development of information and communication technologies in our republic with the Order No. 1146 dated February 17, 2003. has done This has been considered as the direction with the highest priority