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THE ANALYSIS OF "NARROW SPACES" OF THE ENTERPRISE OF THE SHURTAN GAS-CHEMICAL COMPLEX AND WAYS OF THEIR ELIMINATION

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ABSTRACT

In the work given the analysis of "narrow spaces" of the enterprise of the Shurtan Gas-Chemical Complex and ways of their elimination. As well as process, the technology of obtaining polymer granules at the LLC" Shurtan gas-chemical complex "have been presented. The gas chemical industry is important in the southern region of Uzbekistan. The main products, such as Polyethylene granules, produced by LLC "Shurtan gas-chemical complex" are exported and also used within the republic for the production of various types of products. The wide applicability, as well as the purposefulness of the products of Shurtan Gas-Chemical Complex LLC, ensures the sustainable and effective development of various sectors of the economy of Uzbekistan. Serves as a kind of catalyst for the introduction of completely new types of products and technologies.

KEYWORDS: *Gas, chemicals, Polyethene, granule, Pressure, Polypropylene, Polymerization, Dimethyl sulfoxide.*

INTRODUCTION

The gas chemical industry is important in the southern region of Uzbekistan. The main products, such as Polyethylene granules, produced by LLC "Shurtan gas-chemical complex" are exported and also used within the republic for the production of various types of products.

The wide applicability, as well as the purposefulness of the products of Shurtan Gas-Chemical Complex LLC, ensures the sustainable and effective development of various sectors of the economy of Uzbekistan. Serves as a kind of catalyst for the introduction of completely new types of products and technologies [1-9] It makes it possible to actively develop small and medium-sized businesses, as well as increase export suitability in the republic.

MATERIALS AND METHODS

In industry, high-pressure polyethene is obtained by free-radical polymerization of ethylene at a temperature of 200-280 °C and a pressure of 150-300 MPa. The resulting polyethene has the lowest density of 918 - 930 kg / m3. Getting LDPE is a large-scale production. Polyethene is used for the manufacture of technical products, films, products for agriculture, as well as the manufacture of pipes for cold water [1-4].

The operating LDPE unit produces high-pressure polyethene grade 15303-003. The maximum ethylene conversion is 20.7%. To improve the existing installation, it is proposed to reconstruct the reactor unit, as well as to use additional initiators of the reaction. The operating industrial reactor is a tubular tube-in-tube reactor of piston action, divided into 2 zones, with a single additional input of a cold stream of a mixture of initial reagents. Oxygen is used as the initiator of the reaction on the analogue. A schematic diagram of the flows of an operating reactor is shown in Fig. 1.

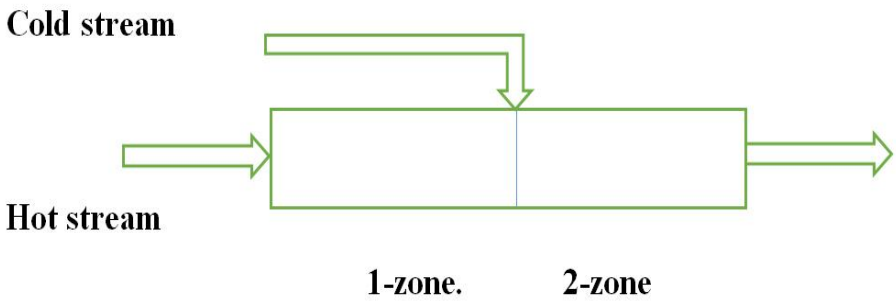

Figure: 1 - Schematic flow diagram of an operating reactor

The construction of additional production facilities will ensure the economic development of the region. An analysis of the bottlenecks of the Shurtan Gas Chemical Complex (SHGHK) was carried out. The focus is on four key units: CHFU, AOP, pyrolysis and polymerization. The main drawback in the CHFU unit was revealed that the required amount of reflux is not created in the ethane column, as a result of which a very fuzzy separation of ethane from the ethane-propane fraction occurs. This, in turn, leads to large losses of ethane with the gas leaving the reflux tank. For greater efficiency of the column, we propose to provide additionally cooled reflux to irrigate the top of the column during the deethanization process. As the reflux temperature for reflux and the top temperature decrease, the ethane content in the liquid on the trays in the reinforcing part

of the deethanizer column gradually increases, and the propane content in the deethanization gases gradually decreases [2-11]. With a decrease in the reflux temperature and the top temperature, the amount of additionally cooled reflux for refluxing the top also decreases, due to which the amount of vapour and liquid in the column also decreases, which makes it possible to increase the feed performance [12-19].

RESULT AND DISCUSSION

When analyzing the AOP plant, the main risk factor was represented by the large flow of raw materials. The installation requires high energy consumption for the process of regeneration of the water-methanol mixture due to a large amount of water and the need for deep regeneration to low residual methanol content in the water.

The solution to the problem is to supply the unit with a mixer for water injection, which will allow organizing the extraction of methanol from the propane fraction stream. The connection of the mixture supply line with the mixer will allow, in the case of a high concentration of methanol in the initial mixture, to reduce it before feeding it to the separation column. Thanks to this, a deep purification of propane from methanol and a decrease in specific energy costs are achieved. To increase the turnaround time, we propose to install a degasser to purify propane from impurities that accumulate and can lead to disruption of the technological process. To increase the driving force of the process, reduced pressure is required, which is created by a throttle installed in front of the degasser.

The pyrolysis unit undergoes frequent decoking processes, which negatively affects the condition of the furnace equipment and the quenching evaporator. Coke deposits significantly impede heat transfer and increase the pressure drop in the pyro tubes. Reduces the reaction zone, thereby reducing product yield, Also, diffusion of carbon atoms from the coke into the wall leads to embrittlement of the metal and the subsequent formation of cracks in the coils. The resulting coke deposits have to be removed periodically. Usually, they are burned out with a steam-air mixture passed through a heated coil; however, damage to the coils is possible due to local overheating due to the high heat of combustion of coke in oxygen. Frequent decoking processes result in reduced productivity, reduced service life and increased operating costs. To increase the turnaround time and ensure an uninterrupted supply of raw materials, we propose the addition of an inhibitor, namely dimethyl sulfoxide (DMSO) [3-7]. It reduces coke formation by 75% and increases the yield of ethylene. DMSO is a by-product of the pulp and paper industry, its involvement as an inhibitor increases the total economic efficiency of production [3-5].

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In polymerization units, it is proposed to increase their efficiency and turnaround time. The Ziegler catalyst has a low performance and is highly corrosive to equipment due to its active chlorine content. As a result, it was decided to replace the second or third generation Ziegler-Natta catalyst with a modern fourth-generation titanium-magnesium catalyst (TMK), use trimethylaluminum as a cocatalyst, and methylcyclohexyldimethoxysilane as a stereoregularity additive.

This replacement leads to an improvement in technical and economic indicators. This will allow improving consumer properties and expanding the branded range of products, improving environmental performance. When using TMC from propylene, up to 40 kilograms of polypropylene per gram of catalyst is obtained, while when using traditional catalysts, no more than 4–5 kg.

CONCLUSION

The problem of creating domestic technologies in the field of gas chemistry is urgent. The demand for petrochemical products will grow every year. Petrochemical clusters are important strategic targets for the development of the country's economy. The modernization of the existing production leads to an increase in the production capacity of Uzbekistan.

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