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## **PROCESS TO EXTRACT HIGH PURITY NAPHTHALENE FROM THE HEAVIER GAS OIL FRACTION FROM NAPHTHA CRACKERS PRODUCING ETHYLENE**

The general power of pyrolysis processes in the world exceeds 130 million tons per year [1]. The process of getting light olefins is accompanied by forming about 20 percent coproducts. The use of these coproducts is a serious technical and economic problem that is associated with increased profitability of production. One of these coproducts is a heavier cut of pyrolysis gas oil (PGO). This is the mixture of different groups of hydrocarbons, greater part of them is aromatic hydrocarbons which boil above 180 Celsius degrees. Nowadays PGO use as source of boiler heater[2]. Only in Russia production of PGO exceeds 325000 tons per year. Belarussian oil refining factory «Polymir» which is part of JSC «Naftan» is able to produce from 12000 up to 16000 tons of PGO yearly[3].

The aim of this work was to propose method of rational refining of heavier cut of pyrolysis gas oil of hydrocarbon feed. We have analysed the Belarussian PGO's chromatography and identified more than 225 individual substances, while the containing of aromatic hydrocarbons in the PGO reaches to 67 mass percent, in particular, naphthalene up to 18 mass percent. Nowadays, naphthalene is produced from coal tar with a high content of heteroatom compounds, expensive cleaning operations are used to remove them. Hence, in our opinion, the most rational method of use of the PGO is getting the naphthalene from it. But the existing methods for the extraction of naphthalene are not used in industry because of high energy inputs, expensive catalysts, or low purity of naphthalene.

We have patented the method of extraction of naphthalene from fractions of liquid pyrolysis products of hydrocarbon feed. It includes atmospheric and then vacuum distillation of PGO with the extraction of naphthalene concentrate that is having azeotropic rectification and then it is coming for the stages of crystallization and pressing. The degree of cleanness of naphthalene corresponds to the requirements of GOST 16106 for "Naphthalene-purified", and can be used as a raw material for petrochemical synthesis. The SO «BELISA» has developed a business plan for the project of this processing station with a planning horizon for 5 years, investment costs are about \$ 3.1 million, net present value (NPV) is \$ 6.9 million, internal rate of return is 74%, dynamic payback period is 2.67 years, product profitability is 28%. These facts prove the rationality of investing in this project. Realization of the process of obtaining naphthalene from resin with lower costs and a higher cleanness will allow increasing the profitability of ethylene production and expanding sources of raw materials for petrochemicals.

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