

PROCESSING OF HEAVY PYROLYSIS RESIN

2020

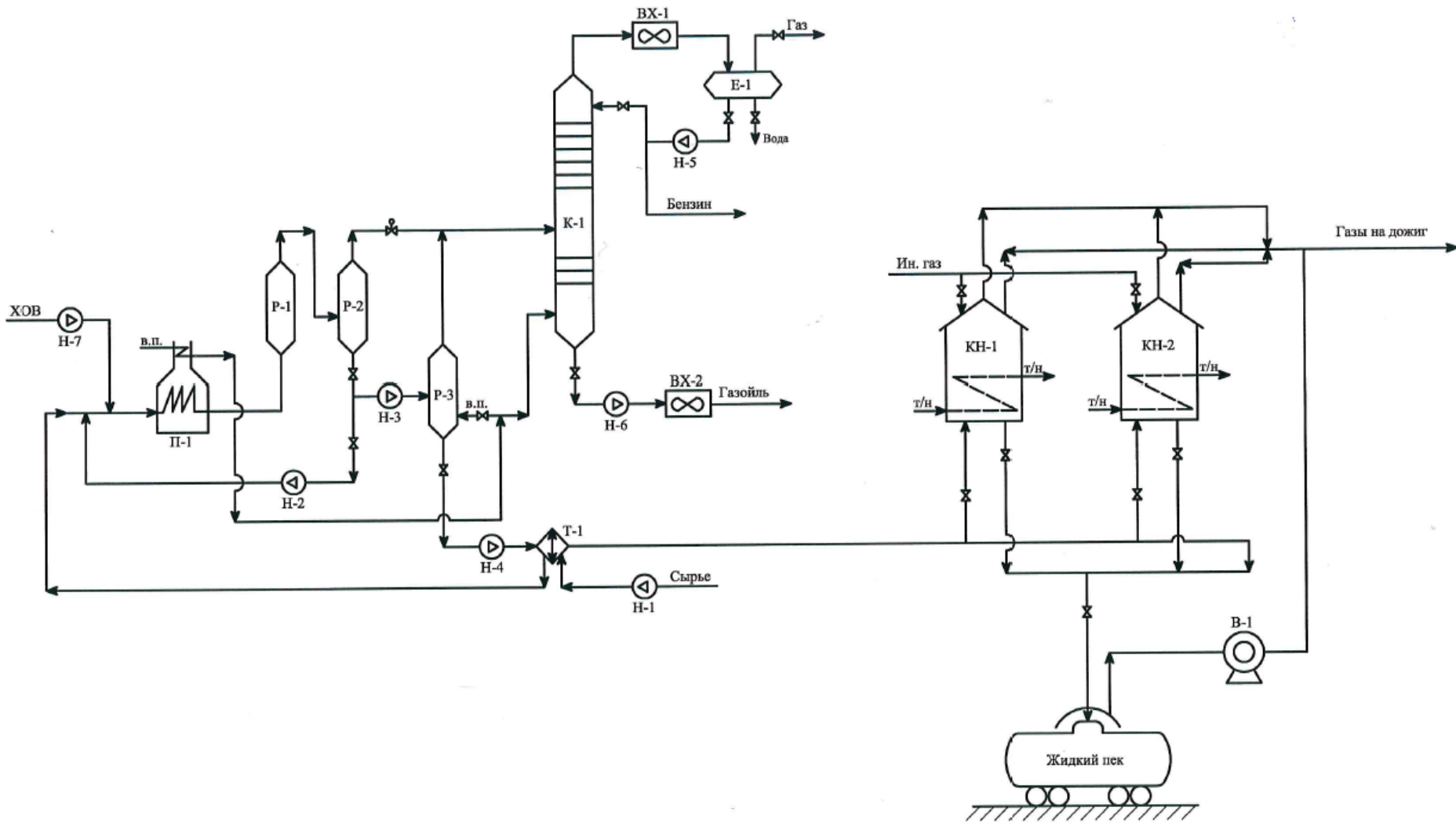
The Institute has developed a complex plan for processing ethylene pyrolysis resin

The plan includes the processes of thermopolycondensation

Received Products:

- high-quality petroleum pyrolysis pitch with low sulfur content and mesogenic properties
- carbon-black raw materials with a high correlation index
- raw materials for the Plasticizer synthesis - an effective additive to concrete mixtures

Complex processing of heavy pyrolysis resin



The technology of complex processing of heavy pyrolysis resin

1 ton of pyrolysis resin and reagents can give:

- 370 kg of oil pitch
- 267 kg of carbon-black raw material
- 1130 kg of Plasticizer (in the form of an aqueous solution with a concentration of 36%)
- 32 kg of aromatic hydrocarbon fraction 70-180 °C

The technology used allows turning the entire pyrolysis resin into valuable market products

The process is highly profitable and low-waste production

Thermopolycondensation wastewater is used in the synthesis of Plasticizer

Hydrocarbon gases (2-3% outcome) can be disposed by burning in a pipe furnace

Toxicological tests were performed for the main products of the process in the production of concrete, artificial graphite and carbon black.

- The production technology is based on the processes of sulfonation, condensation of sulfonic acids with formaldehyde and neutralization of oligomeric sulfonic acids with caustic soda
- The aromatic fractions of reforming processes, petrol pyrolysis or distillates obtained from the pyrolysis resin in the process of its thermopolycondensation serve as a raw material for the process

The plasticizer is introduced into concrete mixtures in a volume of from 0.6 to 1% at foundations building, molding technology of the building and structure construction and allows to achieve:

- increase in the strength of concrete by 40% or save cement by 15-20%
- reduction of water consumption by 15-20%
- slump increase from 4 to 16 cm
- reduction in the mobility loss of the concrete mixture from 11 to 9 cm within 8 hours

The plasticizer is available in solid form (powder)
or in the form of a 32-36% solution

It has a weakly alkaline reaction ($\text{pH} = 7-9$)

Petroleum pyrolysis pitch is a highly effective product for the production of graphite

It is used instead of coal tar pitch as a treating and bonding material

A similar technology use for graphite products processing in petroleum pitch gives the following:

- increase in the density of blanks per 100 kg/m³
- decrease in the coefficient of thermal expansion by 25-30%
- reduction of the graphite production cycle by reducing the number of treating operations
- improvement of the environmental conditions for the graphite production (the concentration of 3,4-benzopyrene is 4-6 times lower than in coal tar pitch)

Specifications

Indicators	PPP-1	PPP-2
Melting point, °C	65-85	90-120
Volatiles yield, %, at most	63	56
Sulfur content, %, at most	0,3	0,3
The content of α -fraction, %, at least	18	23
Content of α_1 fraction, %, at most	traces	3