"Thermal processes of processing of petroleum raw materials. Production of carbon black and petroleum bitumen. Technological design of the process"

Purpose: To inform future employees of the oil industry about the types of processing of petroleum raw materials, the production of technical coal and petroleum bitumen, and about the technological design of the process.

Tasks

Explanation of what thermal processes of processing of petroleum raw materials are.

Information about which processes are used for the production of carbon black and petroleum bitumen.

Explain what the technological design of production is.

Thermal processes of processing of petroleum raw materials

The thermal process is a set of cracking and compaction reactions carried out thermally, that is, without the use of catalysts.

Thermal processes	Thermal cracking
	Pyrolysis
	Coking

Thermal processes of processing of petroleum raw materials

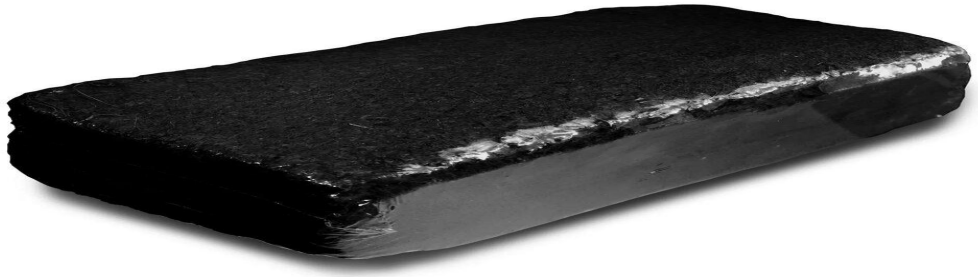
Thermal cracking is the high—temperature processing of hydrocarbons in order to obtain products with a lower molecular weight

Pyrolysis is the thermal decomposition of organic and many inorganic compounds.

Coking is the process of processing liquid or solid fuel by heating without air access.

Production of carbon black and petroleum bitumen

technical carbon is a highly dispersed amorphous carbon product.

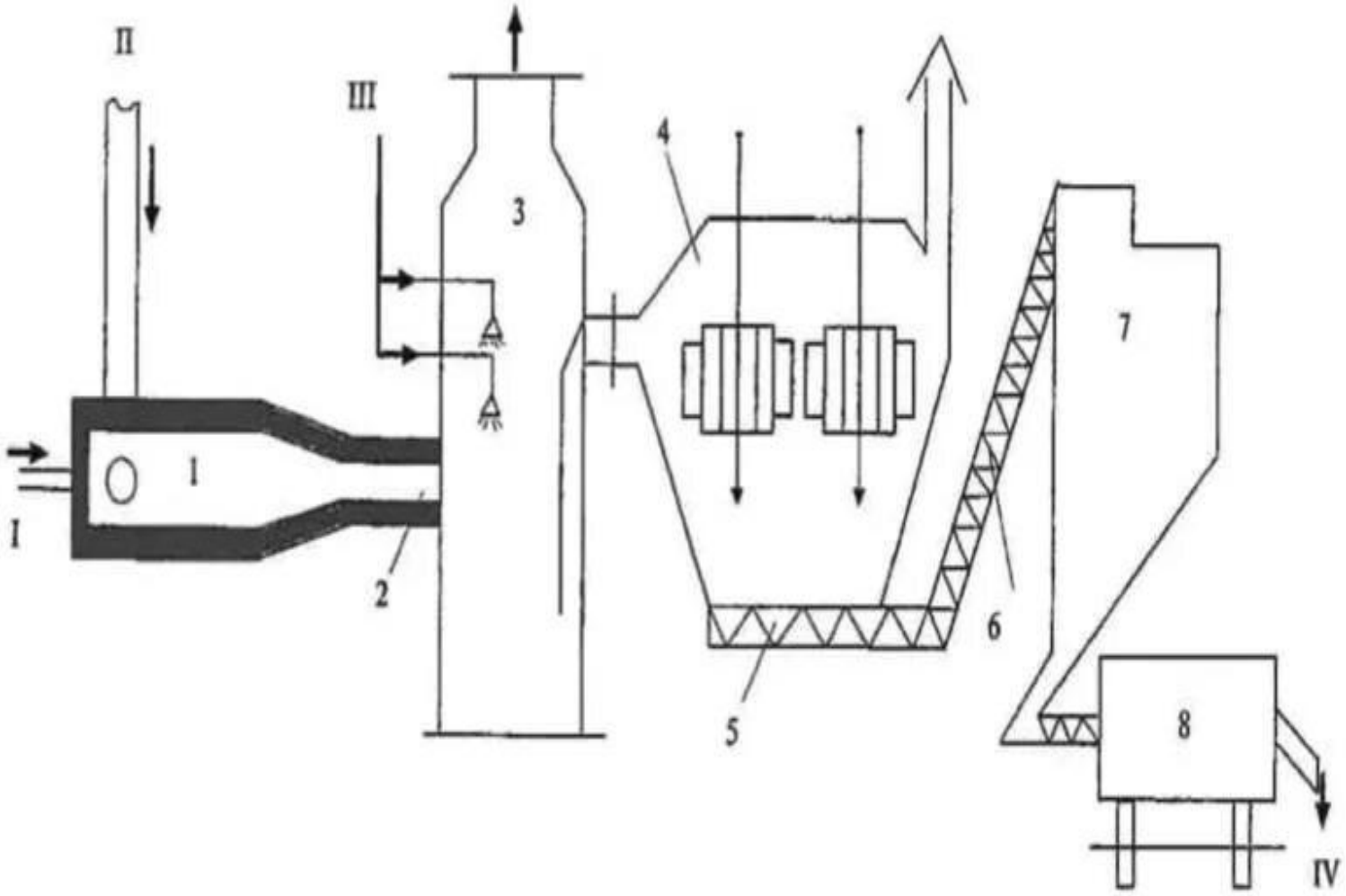


Petroleum bitumen — liquid, semi-solid or solid petroleum products consisting of asphaltenes, resins and oils.

Production of technical carbon

The furnace process is a method that allows to obtain high—quality soot by blowing petroleum oil into a high-temperature gas for their partial combustion.

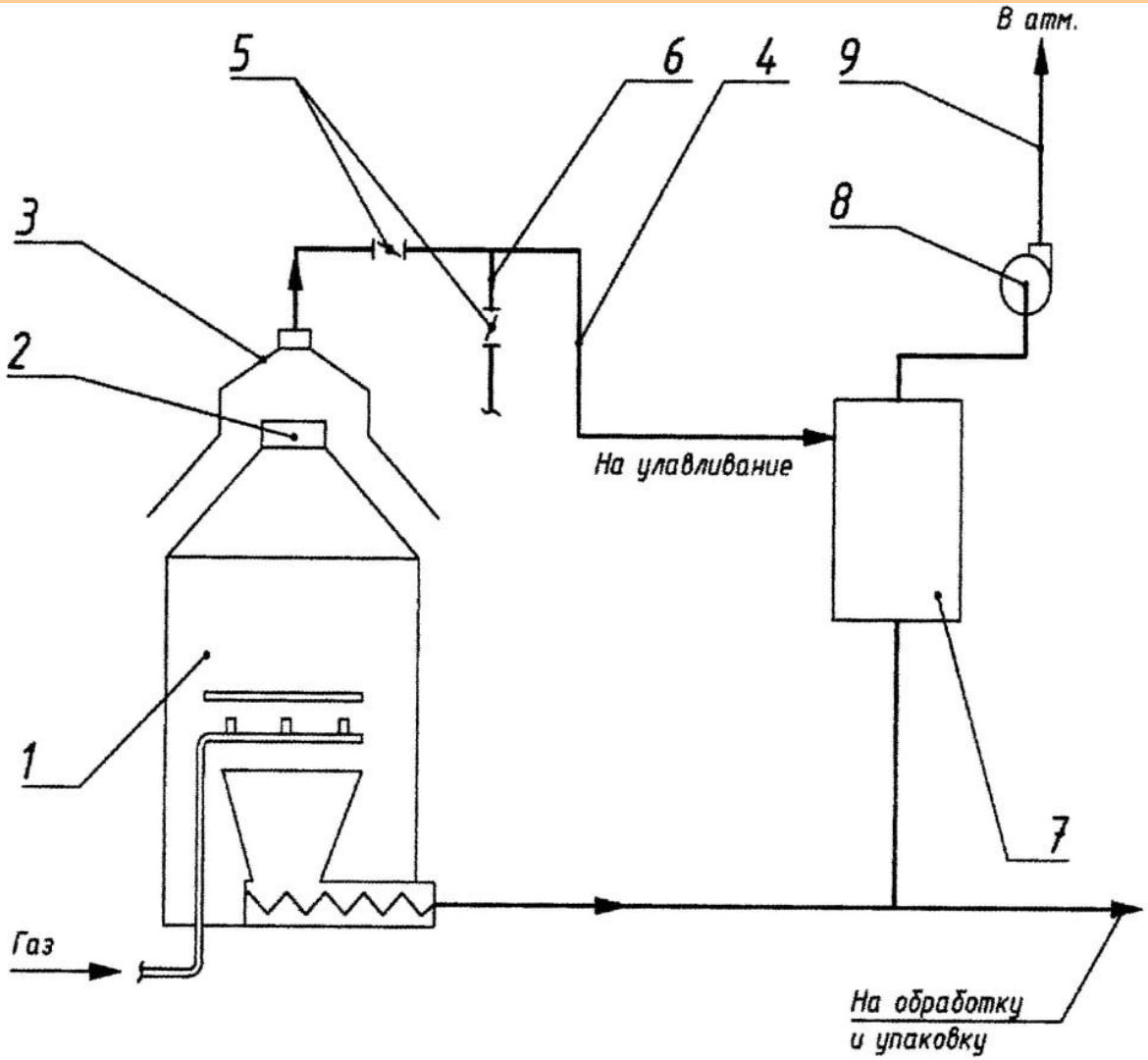
The acetylene process is a method in which soot is formed by thermal decomposition of acetylene gas.



Production of technical carbon

The channel process is a method in which partially burned fuel is in contact with a steel chute cooled by water.

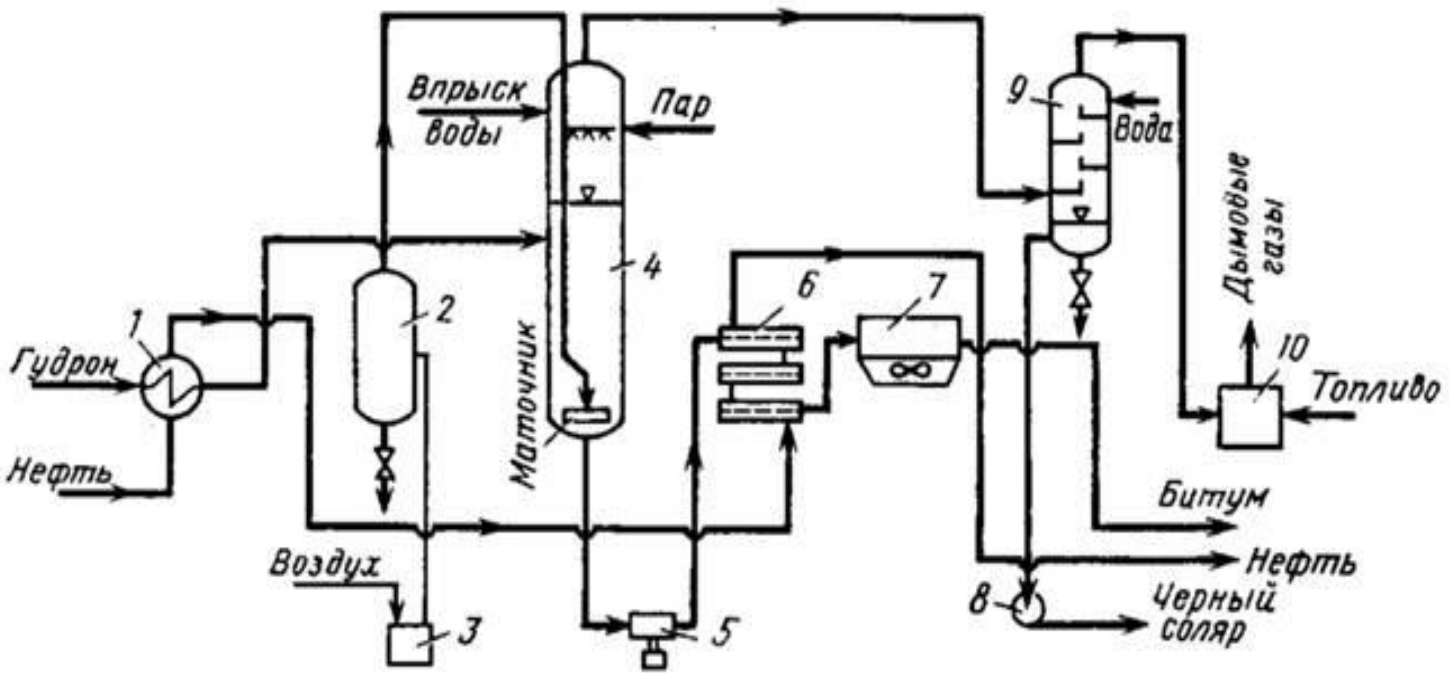
The lamp process is a method of obtaining a product by collecting soot from vapors formed during the burning of vegetable oils or coniferous wood.



Production of petroleum bitumen

Oxygen oxidation is a method in which various oil residues are oxidized by air at a temperature of 180 – 300 ° C.

The method of concentration of oil residues by distilling them in vacuum, at which residual bitumen is obtained.

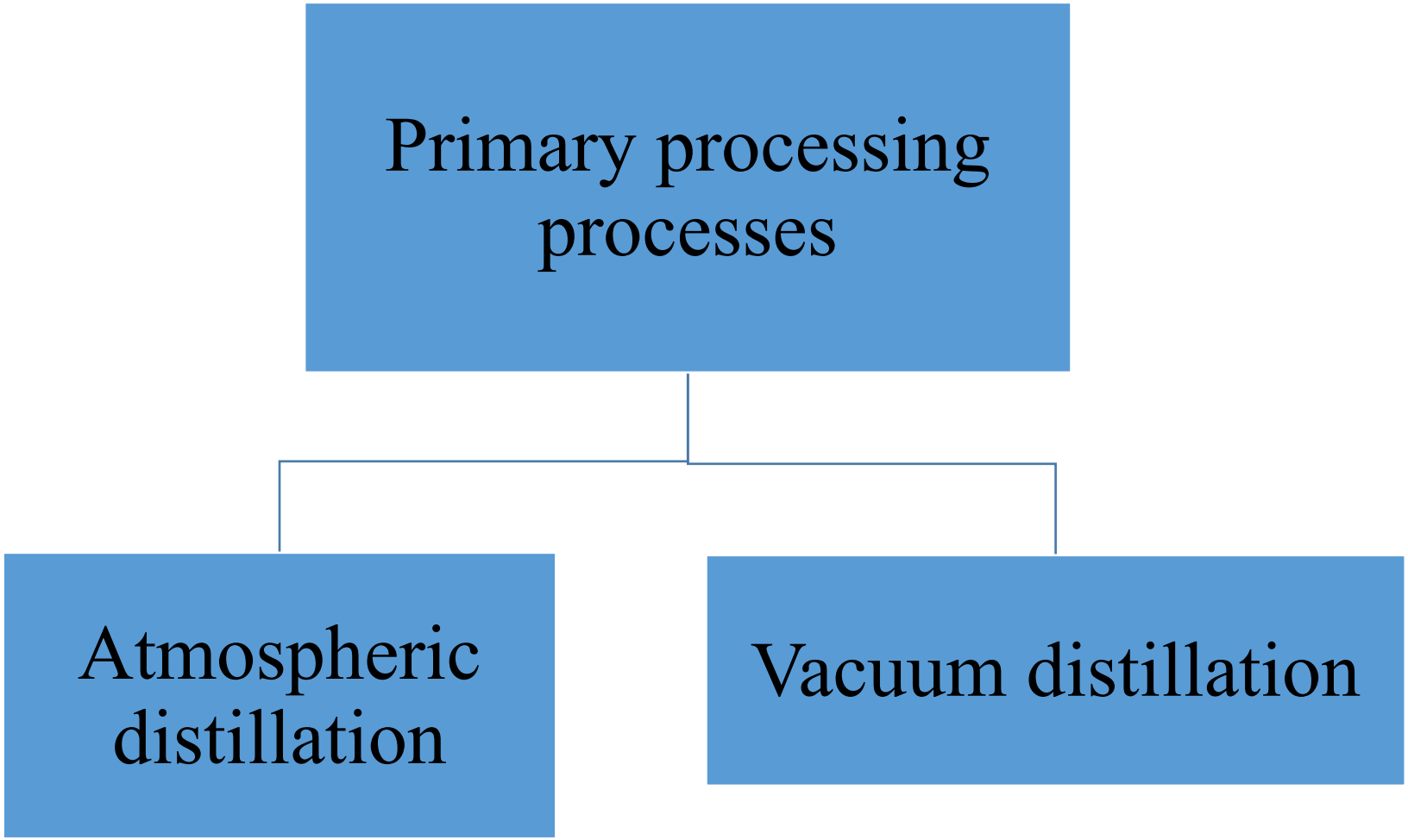


Technological design of the process

Oil refining is the process of producing petroleum products, primarily various types of fuels and raw materials for subsequent chemical processing from oil.

Oil refining → Primary processing processes → Secondary processing processes

Primary processing processes

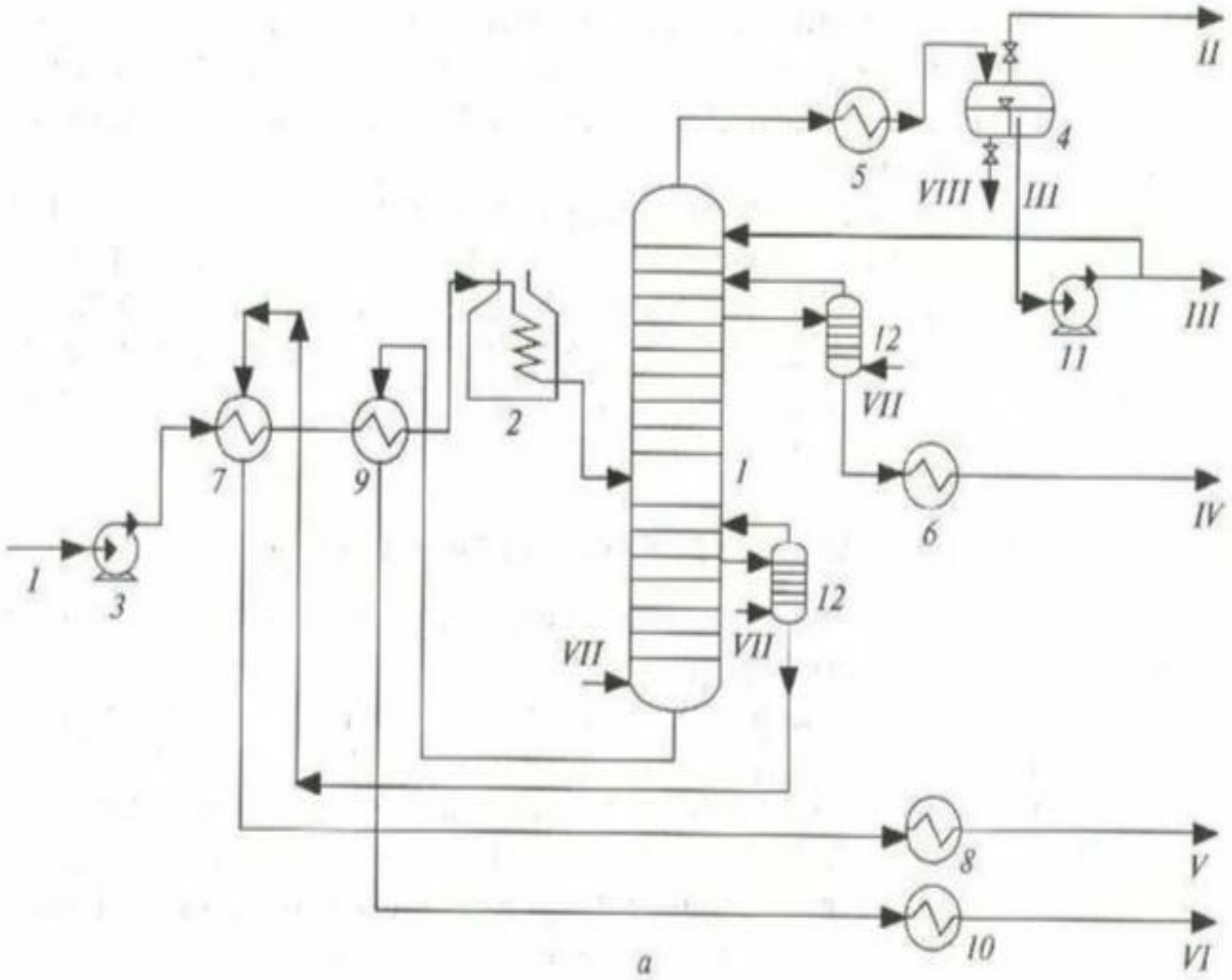


Primary refining processes are the physical separation of oil into fractions.

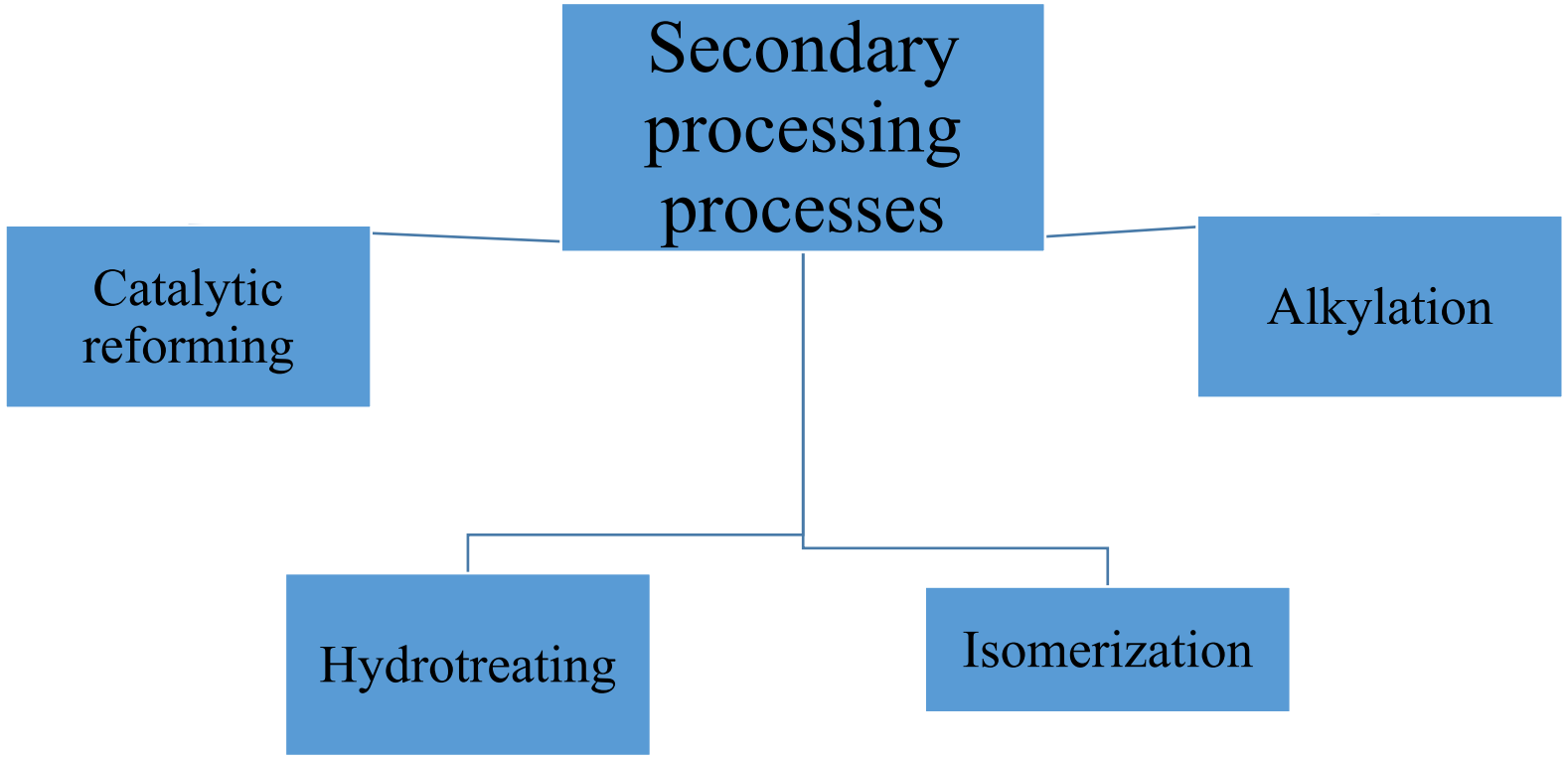
Primary processing processes

Atmospheric distillation is a distillation process carried out at atmospheric pressure.

Vacuum distillation is the process of distilling fractions suitable for processing from fuel oil.



Secondary processing processes

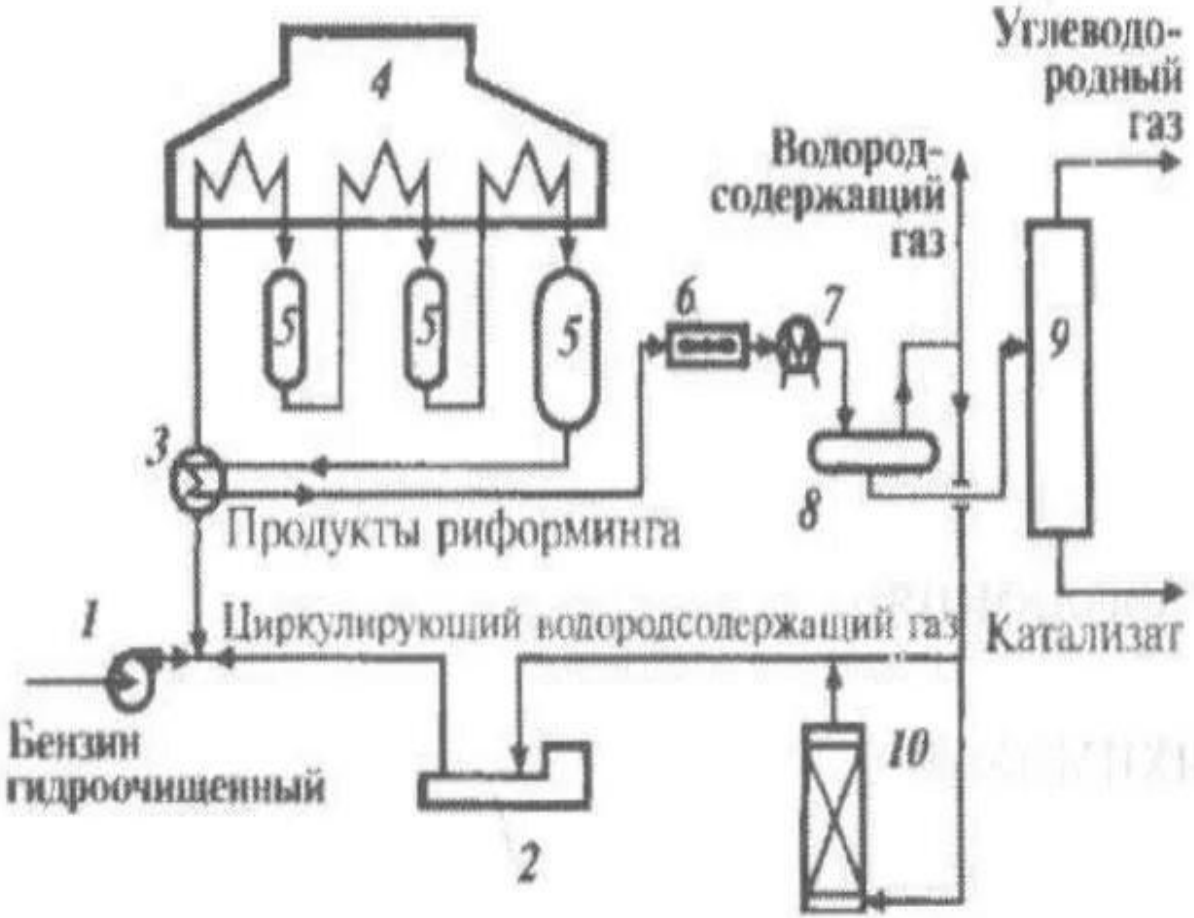


Secondary processing processes — chemical modification of hydrocarbon molecules that make up oil.

Secondary processing processes

Catalytic reforming — catalytic aromatization of petroleum products.

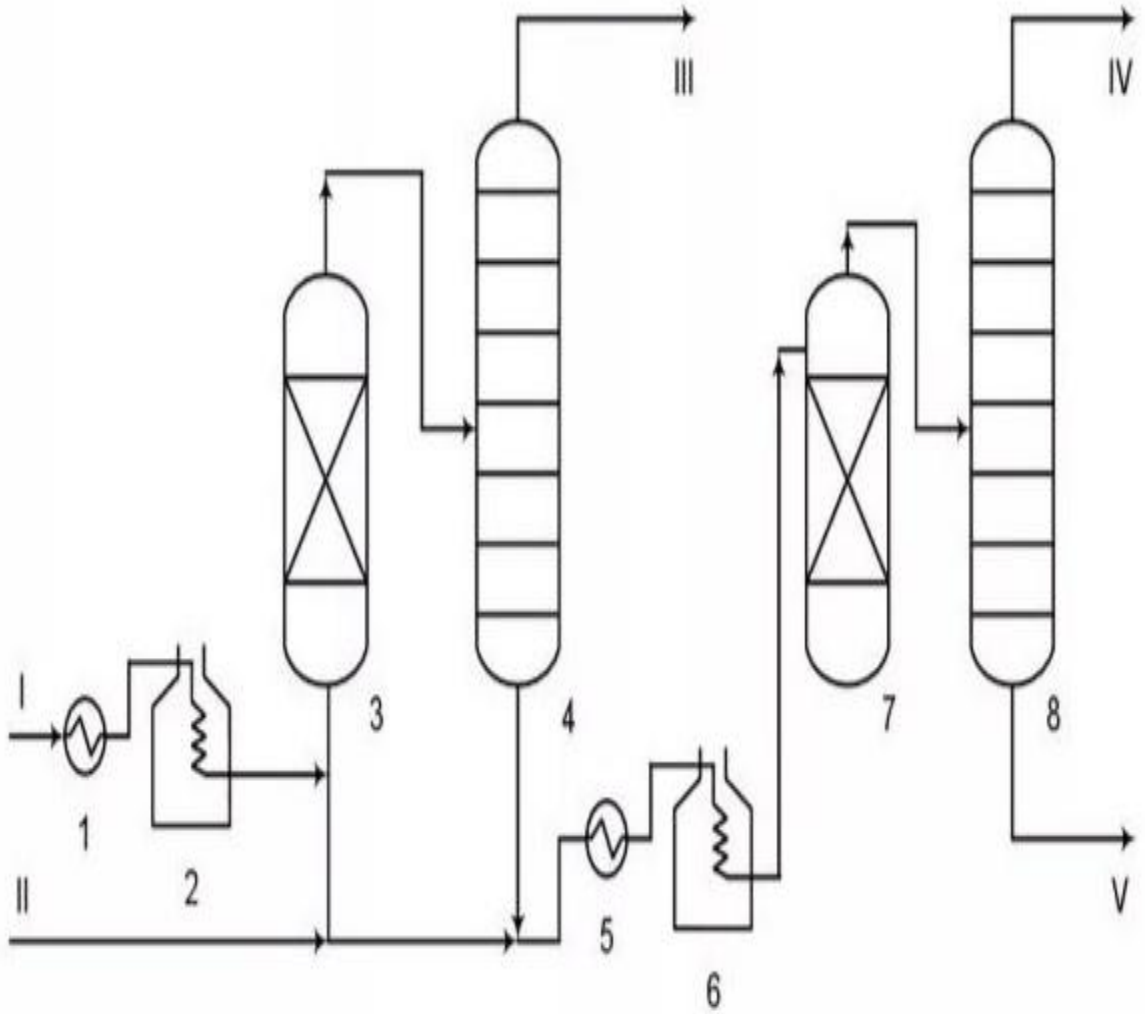
Isomerization is the production of high—octane components of commercial gasoline from low-octane fractions of oil by structural modification of the carbon skeleton.



Secondary processing processes

Hydrotreating is the process of chemical transformation of substances under the influence of hydrogen at high pressure and temperature.

Alkylation is the introduction of alkyl into the molecule of an organic compound.



List of literature

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