

RESOURCE AND ENERGY SAVING IN OBTAINING CRUDE BENZENE FROM COKE OVEN GAS

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Most coke-chemical enterprises in Ukraine are characterized by increased losses of benzene hydrocarbons with return gas, exceeding the maximum permissible PTEs indicated above. Such a state is the cumulative effect of a number of negative factors, which, first of all, should be attributed to: instability of gas and absorption oil consumption; unsatisfactory temperature regime; low quality of circulating absorption oil; unsatisfactory condition of the main technological equipment; low provision of installations with control and measuring instrument systems.

Our work is dedicated to the modernization of installations and technological equipment, and their adaptation to work in modern technological conditions.

A technological scheme equipped with modern technological devices has been proposed, which has the following advantages:

- stabilization of the quantitative composition of the obtained crude benzene (with distillation fluctuations up to 180 °C of no more than ± 1 % in the range of values from 91 to 96 %);

- reduction of gas pressure losses during absorption in the scrubber, which is recommended, can be 30 – 50 % compared to those currently used;

- reduction of steam consumption for distillation of absorbing oil by 2-2.5 times compared to that used;

- reduction of the amount of wastewater from the benzene department to be disposed of.

Resource- and energy-saving technological schemes for the absorption of benzene hydrocarbons from coke oven gas and the production of crude benzene are based on a rational combination of an optimally selected technological regime and the use of intensive scrubbers at the absorption stage, equipped with modern highly efficient elements of the internal structure (regular nozzles, distributors and redistributors of interacting phases). There is a real possibility of organizing the absorption process in one technical apparatus of large unit capacity, which allows reducing the resistance of the installation by 35 – 40 % and creates the prerequisites for full automation of the process of extracting benzene hydrocarbons from coke oven gas. The proposed technical solutions can be used both in the design of new benzene departments and in the reconstruction of existing ones.

References:

1. PTE-2017 Pravila tehnicnoi ekspluatatsii koksohimichnih pidpriemstv. – Kharkiv: DP"Hiprokokks", 2018 [in Ukrainian].