
SCIENTIFIC AND TECHNOLOGICAL SOLUTIONS FOR REDUCING BALLAST SALTS IN COKE OVEN GAS PURIFICATION

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The article deals with the causes of formation of ballast salts in circulating solutions of the absorption process during the purification of coke oven gas from hydrogen sulphide. The processes occurring during the hydrogen sulphide recovery from coke oven gas using the vacuum carbonate method, which consists in washing the coke oven gas with a soda solution, are considered in detail. In this process, acidic components are captured: hydrogen sulphide, carbon dioxide and hydrogen cyanide. The article analyses the causes and stages of ballast salt formation, provides equations and conditions for the relevant reactions. The article analyses the causes and stages of ballast salt formation, provides equations for the relevant reactions, and indicates ways to reduce their formation.

The advantages of a two-stage purification scheme are shown, which allow to reduce the content of unregenerated ballast salts at the second stage. At the same time, the potential of the first stage of purification is used for the selective extraction of hydrogen cyanide (HCN). It has been shown that the selective absorption of hydrogen cyanide in relation to hydrogen sulphide (H_2S) at the first stage of purification leads to a significant reduction in the supply of hydrogen cyanide to the second stage of absorption, and, accordingly, to a reduction in the formation of unregenerated ballast salts in the second stage solution.

The article calculates the consumption of soda products in the process of vacuum-carbonate desulphurisation with selective absorption of hydrogen cyanide in the first stage scrubber and hydrogen sulphide in the second stage scrubber, and also calculates the soda savings for the production of solutions of different concentrations.

The possibility of integrating the used technical solutions into the existing scheme of two-stage desulphurisation is noted.

The considered scheme of coke oven gas desulphurisation with isolated solution cycles of different concentrations can be applied in the perspective projects of SE GIPROKOKS for enterprises in Ukraine and abroad.

Keywords: ballast salts, two-stage vacuum-carbonate desulphurisation, selective hydrogen cyanide extraction.

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