

## Study on the nature of impurities in the circulating glycol solution at the installation of gas purification from acidic components

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### Abstract

Natural gas contains a large amount of moisture, which causes a lot of problems in its transportation and processing. In order to extract this moisture, natural gas gets subjected to the dewatering process, thereby reducing the moisture content and preventing further formation of hydrates. This is achieved by cleaning the gas from hydrogen sulfide and mercaptans and cooling in heat exchangers with the participation of a solution of monoethylene glycol.

Together with gas, impurities come in the form of hydrocarbons, brine water, mechanical impurities, corrosion inhibitors, various SASs, resinous substances, etc. As a result of deposition of unwanted impurities on the internal surfaces of devices, the efficiency of mass exchange and heat exchange processes is reduced, equipment wear is increased, so is the laborious process of cleaning equipment during planned repairs, the temperature of the glycol block is disrupted and, as a result, the reagent consumption increases in order to maintain the necessary dewatering temperature of natural gas, and the waste of the glycol from the regeneration apparatus increases.

The object of the study was the regeneration block of the saturated solution of monoethylene glycol. During the planned repairs of the plant, there was revealed significant contamination of the devices and heat exchange equipment of the glycol regeneration unit with a large number of unwanted impurities and sediments, as well as significant corrosion of pipe beams of heat exchangers and internal cavity of devices.

We found that the most effective ways to prevent sediment formation in the monoethylene glycol regeneration unit are to better control the level of amine in the 374 B09 devices, to control the consumption of the amount of monoethylene glycol injected into heat exchangers, and to reduce the amount of impurities in the circulating solution of monoethylene glycol. Also, to reduce sediments in the heat exchange apparatus of the gas dewatering section, we recommend increasing the separation rate by installing jack elements in the 374 B09 separator and installing an additional filter in accordance with the proposed scheme, with a cartridge of polyphenylsulfide or fiberglass.

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