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DEVELOPMENT OF TECHNOLOGICAL METHODS FOR OBTAINING AMINE ABSORBENTS BASED ON LOCAL RAW MATERIALS FOR OIL AND GAS PROCESSING PLANTS

Orozova Oghiloy Faizullayevna

Student Of The Faculty Of Chemistry Of Termiz State University, Uzbekistan

Eshdavlatova Mukhlisa Alim's

Student Of The Faculty Of Chemistry Of Termiz State Universitet, Uzbekistan

Ubaydullayeva Nasiba Turgunboy

Student Of The Faculty Of Chemistry Of Termiz State University, Uzbekistan

Madiyev Azizbek Mamasoat

Student Of The Faculty Of Chemistry Of Termiz State University, Uzbekistan

Yunusov Khurshid's

Student Of The Faculty Of Chemistry Of Termiz State University, Uzbekistan

Tursunov Abbas Tora

Student Of The Faculty Of Chemistry Of Termiz State University, Uzbekistan

ABSTRACT: - For oil and gas refineries, the development of technological methods for obtaining amine absorbents based on local raw materials will make it possible to more thoroughly clean

hydrocarbon gases. The chemical reagent that replaces the import will be localized and the currency allocated for it will be saved.

KEYWORDS: Toxic gases CO, SO2, NOx, hydrocarbon gases, absorbent, hydrogen sulfide (H2S), dusts, absorption and catalytic methods.

INTRODUCTION

In recent years, in our country, the main focus has been on methods of cleaning natural and released gases from sulfur-containing organic compounds, mercaptans, carbonyl sulfide (SOS), carbon disulfide (SS2) and sulfide ethers (RSR) in oil and gas processing enterprises, as well as high gas purification certain results are being achieved in the creation of effective new composite absorbents and improvement of cleaning technologies. In the Action Strategy for the further development of the Republic of Uzbekistan, the tasks of "raising the industry to a new level in terms of quality, in-depth processing of local raw materials, accelerating the production of finished products, and mastering new types of products and technologies" are defined. In this regard, scientific research aimed at creating new composite absorbents with various functional groups, which tend to clean the gases released from sour components in natural gas processing and chemical production, is of great importance.

Separation of gas mixtures and rational use of the separated compounds in various sectors of the national economy is one of the main urgent issues of today. A number of natural and synthetic absorbents are used to clean sour gases containing sulfur from natural gas. It is known that the issue of using local absorbents in the purification of sulfurous sour gases from natural gas is one of the first problems to be solved. Later, the use of MDEA was shown to be of great importance in the extraction of hydrogen sulfide from gas. Compared to DEA, MDEA differs in several ways. Production of MDEA instead of DEA, which is used in the Shortangaz chemical complex, such a visit also suggests the use of a composite working solution of MDEA with hexamethylenediamine.

The raw materials of MDEA extraction technology for industry are ethylene oxide (EO) and methyl amine (MA). The process is based on chemical synthesis. A technological scheme has been developed below. The technological scheme consists of 3 main blocks. 1 block consists of EO and MA collection devices - collectors. 2 - block - reactor block, chemical reactions take place in the reactor. Block 3 is a block for separation of product mixtures.

Raw materials EO and MA are fed to the reactor unit by dosing. The MA flow from the separation stage is added to the flow from the reservoir. MDEA is synthesized from the mixture in the mixing reactor at a temperature of 40-70 0C and a pressure of 0.5-0.7 MPa based on the following chemical reactions. The synthesis product that came out of the top of the reactor and did not react

The remaining raw materials (3) are separated in a desorber-separator (100-120 0C). MA is separated in the desorber-separator and cooled in the concentrator (7). MA is collected in the intermediate capacity (6) and added to the raw material line. The composition of the reaction mixture separated from below in the desorber-separator (3) is directed to the separation of MA, MMEA, MDEA, OMDEA mixtures. In this case, MA is evaporated through the evaporation column (8) and transferred to the MA collection capacity. Excess MA and intermediate product - MMEA are returned for synthesis. The remaining mixture is separated by a distillation column (9) to separate the intermediate fraction and a distillation column (10) to separate the methyldiethanolamine.

The main advantages of the created production: low synthesis temperature (up to 70°C), low pressure in the reactor unit (up to 0.7 MPa), high productivity (0.8 tons of EO and 0.3 tons of MA are consumed to obtain 1 ton of MDEA ladi) is significant with. The appearance of the obtained MDEA is a clear liquid without mechanical impurities, it is not very colorful on the platinum-cobalt scale (in the Hazen unit), it meets the set standards. The advantages of the technological process are that the equipment used is simple and the costs are low. So far, monoethanolamine (MEA) and diethanolamine (DEA) have been used as absorbents for gas purification in production. According to world practice, it was found that replacing diethanolamine (DEA) with methyldiethanolamine (MDEA) as a more effective absorbent gives better results. In the reaction of MDEA with H2S, the specific heat capacity is small compared to DEA. Therefore, DEA/MDEA absorbent requires less energy. It does not cause difficulties in regeneration of saturated absorbent. In recent years, MDEA methyldiethanolamine has been of great importance in the purification of gases from hydrogen sulfide, which made it possible to reduce the foaming process. It differs from diethanolamine by many indicators. The concentration of amines used in production conditions in an aqueous solution is up to 20% for MEA, and up to 30% for DEA.

Chemically purified or distilled water is used to prepare solutions of amines. In some cases, steam condensates are used. Only when the pH of the composition with MDEA is higher than 10, the amount of absorbent water is 30% and the viscosity of the absorbent is sufficient.

Advantages of MDEA solution over DEA:

- high selectivity of the process, since MDEA is a selective absorber, it absorbs more H2S and less CO2;
- 35-50% decrease in relative output of steam and electricity; 10-20% increase in plant productivity;
- reduction of the relative loss of MDEA vapors due to their low elasticity;
- obtaining additional sulfur as a result of increasing the concentration of hydrogen sulfide in high sulfur acid gases;
- reducing the temperature of purified gases in accordance with the temperature and humidity of the NTS device;
- as a result of reducing the emission of sulfur dioxide into the atmosphere, it is possible to improve the environmental situation in the areas where the plant is located.
- MDEA solution saturated with sour gases corrodes metals less than DEA.
- requires less steam consumption for the regeneration process compared to DEA.

CONCLUSION

The conclusion is that in connection with the change in the standard requirements for the quality of natural gas supplied to consumers, it is necessary to further refine the parameters and composition of technological natural gas. In the volatile gas desulphurization unit, gas treatment with diethanolamine was switched to methyldiethanolamine treatment. Initially, the device produced 1.3 mln of 0.1% H_2S and 2.65% CO_2. m/day designed for gas processing. The results of calculation and comparative analysis show that the concentration (ratio) of 28% MDEA and 2% DEA, the carbon dioxide content of commercial gas is below 1.5% molar, and the hydrogen sulfide content is below 3.5ppm, which is 01.01.2022 conforms to the parameters of the state standard introduced since

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