

Corrosion Occurring in the Technological Processes of Oil and Gas Processing and Methods of its Prevention

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Abstract: This article develops and provides information about the main types of corrosion, the causes of their occurrence, methods and means of prevention and elimination in the process of oil and gas pre-processing.

Keywords: corrosion, anticorrosive, inhibitor, galvanic, polymer material.

In the world, a lot of work is done against the corrosion that occurs in the technological processes of oil and gas processing. This is done in different ways depending on the composition of raw materials and parameters of technological processes.

➤ **Chemical:** An anti-corrosion additive is added to prevent corrosion from cooling water.

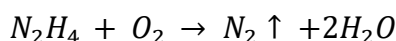
Effectively protects ferrous and most non-ferrous metals. The effective concentration is 5-20%, depending on the protection and storage conditions of the treated product. When applied to the metal after drying, the anti-corrosion inhibitor forms a thin film (thickness up to 1 micron). The anti-corrosion inhibitor is an excellent alternative to oil storage. (at 100% humidity). Easily removed with water or alcohol cleaners.

Extraction of fossil hydrocarbons is carried out by drilling wells and raising the raw materials from the depths to the surface through pipelines. The obtained substance consists of oil, gas, water and chemical mixtures. This is an aggressive environment that corrodes the metal surfaces of deep pipelines. Use of anti-corrosion materials in the production of pipes or technological devices. These are alloy and stainless steel, chrome-plated, galvanized or nickel-plated, as well as polymer materials used in the production of pipes. Production of materials in this way is expensive and does not give the desired effect when working in extreme conditions. Reducing environmental aggression. This method is called inhibitory protection. The essence of the method is to introduce into the environment chemical compounds that resist the destruction of metal surfaces in sufficient concentration. Manufacturers of corrosion inhibitors take into account the pipe material, its composition and the degree of aggressiveness of the environment, and develop effective methods of protection. The inhibition method is characterized by high efficiency, low cost and ease of implementation - there is no need to treat metal surfaces with

protective enamels and mastics or order expensive alloy steel pipes - it is enough to place the chemical substance in an aggressive environment. To neutralize or slow down corrosion processes, the production of corrosion inhibitors is a special branch of the chemical industry, which is based on special fundamental knowledge and scientific discoveries.

- Water is completely deoxygenated using hydrazine to produce steam. Oxygen is the main corrosive agent.

Ammonium salts are highly soluble. When salts are dissolved in hydrazine, their hydrazination, i.e. solvation, occurs. Hydrazine is used as a corrosion inhibitor in cases where corrosion is associated with oxygen absorption. Heat is added to water to protect electrical equipment and oil tankers from corrosion. Reducing salts can be used for the same purpose, for example, sodium sulfite, but hydrazine has an advantage over them in that its oxidation product, unlike sodium sulfite, is not a salt and therefore does not cause an increase in concentration. Hydrazine is widely used in the chemical industry as an oxygen-reducing agent in demineralized water used to feed boilers (boilers, ammonia production, weak nitric acid, etc.). In this case, the following chemical reaction occurs:



Hydrazine hydrate (diamide) has the chemical formula $H_2NNH_2 \cdot H_2O$. It is used as an oxygen inhibitor for boiler water supply systems and space heating systems to prevent corrosion damage during equipment operation.

- Nitrogen and technical air are completely dehumidified, preventing rusting in pipes.

Process air is air used in direct contact with products for cleaning, ventilation and transportation. Control valves and cylinders - control equipment, use and production processes. Gases give air its main technical property - compressibility. This allows air to be used for various purposes, both as an energy carrier in pneumatic systems and as an energy accumulator (storage device) when compressed or heated in cylinders and container.

Table-1. Composition and technical characteristics of airs

Gas	Content	
	By size	By weight, %
Nitrogen	78,084	75,5
Oxygen	20,9476	23,15
Argon	0,934	1,292
Carbon dioxide	0,0314	0,046
Neon	0,001818	0,0014
Krypton	0,000114	0,003
Methane	0,0002	0,000084
Helium	0,000524	0,000073
Hydrogen	0,00005	0,00008
Xenon	0,0000087	0,00004

- In addition, some products, for example, polymers in powder form, add additives such as atmer so that they do not cause corrosion due to friction.

Atmer is anti-static additives, anti-fog additives, as well as concentrates. They are best suited for applications where static protection is required, such as packaging, to prevent the attraction of dust that can affect the performance or appearance of parts. They are available in different formats depending on application requirements: short- and medium-term, easy-to-dose concentrates, amine-free concentrates.

- Since many devices use alkali or acids, once they are involved in production, the alkali is neutralized with acid and the acid is neutralized with alkali. This prevents corrosion of pipes and devices.
- All water in the complex is completely purified from mineral salts, which prevents corrosion in pipes.

During oil production, reservoir water, mechanical impurities (sand, clay, etc.) and mineral salts are released simultaneously in the form of complex emulsions. Oils from the fields of Uzbekistan have a high content of mineral salts, which forces production workers to use multi-stage processes of dewatering and desalination (in the field, oil refining facilities and oil refineries).

In conclusion, we can say that the conditions given above are constantly observed in all technological processes in oil and gas processing plants. The solution is to take action individually or compositionally with the circumstances studied. With this, great economic efficiency will be achieved for the oil and gas industry. With this, not only the oil and gas industry, but also other chemical industries find a solution to the corrosion problems that occur in the technological processes of the enterprise.

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