APPLICATION OF BIS-(2-HYDROXYETHYL) TEREPHTHALAMIDE OBTAINED FROM SECONDARY PET AMINOLYSIS AS AN EFFECTIVE CORROSION INHIBITOR.

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Annotation This article bis-(2-hydroxyethylen) eterephthalamide was synthesized by destroying secondary polyethylene terephthalate. The resulting bis-(2-hydroxyethylen) eterephthalamide was shown to be useful as a corrosion inhibitor for steel materials.

Keywords Secondary polyethylene terephthalate, diethanolamine, bis-(2-hydroxyethyleneterephthalamide, inhibitor, corrosion, monoethanolamine

Corrosion protection of steel and its alloys is one of the most important areas of industry. Therefore, it is considered an effective method of changing the environment in the chemical industry. Unfortunately, corrosion in acidic and alkaline environments is a major engineering problem in the chemical industry. To reduce the risk of corrosion of metal pipes and metal tanks, it is necessary to use corrosion inhibitors that suppress the corrosion of solutions. Corrosion inhibitors include inorganic inhibitors and organic inhibitors. Inorganic inhibitors usually include chromates, dichromates, tetraborates, molybdates, arsenates, nitrites and phosphates. The use of inorganic compounds such as chromates and nitrites is somewhat limited due to their high biological toxicity, environmental pollution and high cost. Thus, organic corrosion inhibitors are one of the most promising methods of combating corrosion. Many organic corrosion inhibitors mainly contain O, N and S heteroatoms, aromatic rings and multiple bonds, all of which can contribute lone electron pairs, which ensures stronger adsorption of inhibitor molecules on the metal surface. It can interact physically or chemically with the metal surface and strongly adsorb on the metal surface and form a protective film capable of isolating the aggressive environment.

The authors depolymerized PET waste with triethanolamine to a glycolized product. Then, it was esterified with bromoacetic acid in the presence of manganese acetate as a catalyst. The resulting ester was reacted with thiourea to form a thiol derivative. The synthesized compound was used as an inhibitor for A'I XL65 carbon steel. The results of this study showed that the inhibitory efficiency increased with increasing inhibitor concentration. [1, p. 15-16] .

PET waste was used for efficient recycling by the aminolysis method and for use as an effective corrosion protection agent.

In the present work, aminoethylethanolamine (AEEA), which has primary and secondary amine groups along with hydroxyl groups, was used for the aminolysis reaction. The reaction was carried out in a microwave reactor equipped with a magnetic stirrer and a reflux condenser. The ratio of PET and AEEA was 1:3 molar in the presence of 0.5% rosacea catalyst at 180-185 °C for 30 min. The resulting aminolysis product was mixed with neopentylglycol fatty acid and phthalic anhydride and successfully synthesized. The resulting polyesteramides were added to polyisocyanates and applied to mild steel panels. The optical, mechanical, chemical, thermal and corrosion properties of the samples were investigated [2, 924- 936 b].Table 1.

The results of corrosion tests without inhibitors and with BGTFA inhibitor are presented in Table 1. It should be noted that in order to increase accuracy and efficiency, the tests were carried out in an aqueous environment similar to oil and gas field products for 168 hours.

As can be seen from Table 1, in tests without inhibitors, the sample lost a significant amount of mass due to corrosion, which was 0.6426 g. This, in turn, indicates a high average corrosion rate - 1.184 mm/year.

On the other hand, from the data presented in Table 1, it can be concluded that the “FOBS-14” inhibitor demonstrated high efficiency. As for the “FOBS-14” inhibitor, it also showed similar results to the above. In particular, when the inhibitor "FOBS-14" was used, the sample lost about 0.04 g of mass during the test. The average corrosion rate was 0.0792 mm/year. The inhibitor efficiency was 93.3%.

№	**Inhibitor name**	**Test environment**	**Test start time**	**Sample mass: before test, g,**	**Sample mass: after test,, *g***	**Mass lost during test, *g***	**Sample surface m^2**	**Average corrosion rate, *mm/year***	**Inhibitor efficiency, %**
1	–	water	1 week	43.4519	43.4390	0.0129	0.003586	0.0432	–
3	F0BC-14	water	1 week	45.7306	45.6904	0.0402	0.003382	0.0792	93.3

Conclusion. In this work, the effectiveness of BGTFA, obtained by aminolyzing secondary polyethylene terephthalate with monoethanolamine, in protecting metal surfaces from corrosion was studied. The results of the study showed that BGTFA molecules adsorb on the metal surface, forming a dense and

stable protective layer. Nitrogen and oxygen atoms in the amine and amide groups of the molecule interact with the metal, effectively slowing down the corrosion process. The resulting protective layer limits the effects of aggressive environments and increases the operational stability of the metal. The results obtained confirm the possibility of using BGTFA as an environmentally acceptable corrosion inhibitor.

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