

## **Inhibitory study of aromatic and aliphatic derivatives of N,Ni-dialkyl-amino-butyn-2-ol-1**

**K.Sh. Khamroev., F.M. Rakhimova., S.Yu. Khusanov., F.J. Khujaeva**

**ABSTRACT:** Until now, iron and its alloys, considered the main material of machine-building, are of special importance among metals. Iron and its alloys make up 90% of metals produced worldwide. This is explained by the fact that ferrous metals have important physical and mechanical properties, as well as the fact that iron ores are widely distributed in nature, and the production of cast iron and steel is cheap and uncomplicated.

Along with ferrous metals, non-ferrous metals are also important in technology. This is explained by their unique important physico-chemical properties, which are not found in ferrous metals. Copper, aluminum, magnesium, nickel, titanium, tungsten, as well as beryllium, germanium, silicon and other non-ferrous metals are widely used in aircraft construction, radio engineering, electronics and other industries.

**KEYWORD:** Steel and its alloys, acidic and alkaline environments, Corrosion inhibitors, Chromates and nitrites, N,Ni-dialkyl-amino-butyn-2-ol-1, N,Ni -dimethylamino -butyn-2-ol-1 inhibitor.

Protection of steel and its alloys from corrosion is one of the most important areas of industry. Therefore, it is an effective way to change 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 quench the corrosion of solutions. Corrosion inhibitors include inorganic inhibitors and organic inhibitors. Inorganic inhibitors commonly 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 corrosion control. Most organic corrosion inhibitors mainly contain O, N and trivalent compounds, all of which can contribute lone pairs of electrons, which ensures stronger adsorption of the inhibitor molecules on the metal surface. It can interact physically or chemically with the metal surface and is strongly adsorbed on the metal surface and forms a protective film capable of isolating the aggressive environment.

The effect of inhibitor concentration, pH environment, duration of exposure and temperature on metal corrosion of aromatic and aliphatic derivatives of N, Ni-dialkyl-amino-butyn-2-ol-1 was

investigated. With an increase in the acidic environment, the rate of corrosion increases and the level of protection decreases.

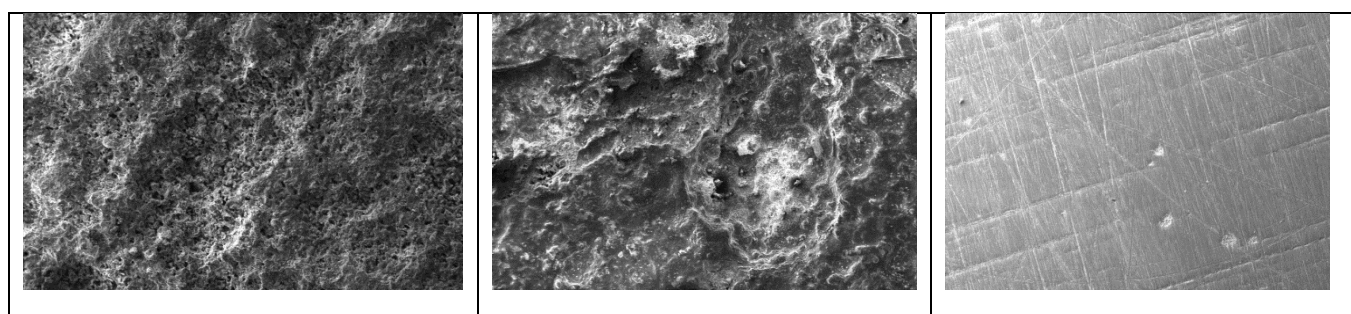
For example, when  $rN=5$ , the corrosion rate of N,NI-dimethylamino-butyn-2-ol-1 inhibitor at a value of 0.02% by mass is 0.64 g/m<sup>2</sup>.s, the level of protection is 64.4%, corrosion at  $rN=2$  speed of 0.78 g/m<sup>2</sup>.s, protection level was found to be 56.7%. As the alkaline environment increases, the rate of corrosion and the level of protection decrease. For example, when  $rN=9$ , the corrosion rate is 0.85 g/m<sup>2</sup>.s, the level of protection is 55.2%, and at  $rN=11$ , the corrosion rate is 0.77 g/m<sup>2</sup>.s, the level of protection is 29.3%.

With an increase in the amount of inhibitor, the corrosion rate of metals decreases, and the level of protection increases.

In addition, the effect of temperature on the rate of corrosion and the degree of protection was also studied. It was found that the rate of corrosion increases and the level of protection decreases with the increase in temperature.

In order to study the effectiveness of the inhibitor on the surface of St. 3 steel, the results of analysis were analyzed in a powder diffractometer (X-ray phase analysis) and an electron microscope. The results of the study are presented in the figure.

Analysis of the surface of the samples in an electron microscope showed that the inhibitor protected the surface of the sample from the effects of hydrochloric acid (v), but individual widths on the surface of the sample were exposed to acid (a) and alkali (b), and the results of corrosion can be seen in these widths



a) in hydrochloric acid; b) in alkali; c) in the presence of 4-N-dimethylamino(butyn-2)ol-1 inhibitor with 0.02 wt.% in an alkaline environment (pH=11)

**Picture. Electron microscope view of three grades of steel.**

**Impact concentration in medium and rapid corrosion of steel St. 3 degrees of humidity, exposure time 24 hours, temperature 40 0C**

№	Содержание ингибитора, масс. %	рН среды							
		2		5		9		11	
		СК г/М <sup>2</sup> ·ч	СЗ, %	СК г/М <sup>2</sup> ·ч	СЗ, %	СК г/М <sup>2</sup> ·ч	СЗ, %	СК г/М <sup>2</sup> ·ч	СЗ, %
1.	Исх. металл (без ингибитора)	1,8	-	1,80	-	1,89		1,09	

2.	ДМАБ 0,02%	0,78	56,7	0,64	64,4	0,72	50,2	0,75	46,3
3.	ДМАБ 0,1%	0,39	78,3	0,32	2,2	0,39	64,7	0,42	77,5
	ДЭАБ 0,02%	0,85	52,7	0,81	55	0,86	21,0	1,01	46,6
	ДЭАБ 0,1%	0,42	76,4	0,40	77,5	0,43	60,6	0,50	73,3
	ДБАБ 0,02%	0,97	46,0	0,90	50,0	0,91	16,5	1,18	38,0
	ДБАБ 0,1%	0,48	73,1	0,46	74,2	0,45	58,3	0,59	69,0
	ДФАБ 0,02%	1,07	40,55	1,26	30,0	0,96	11,9	1,32	34,9
	ДФАБ 0,1%	0,53	70,3	0,63	65,0	0,66	65,1	0,48	56,0
	ДПАБ 0,02%	1,2	33,3	1,52	15,5	1,03	5,87	1,42	24,8
	ДПАБ 0,1%	0,76	57,80	0,60	66,7	0,51	53,0	0,71	62,4

**Used literature:**

1. Пат. США #617349. Композиция активных красителей//Lai-Bao-Kum, Song Derchin//ПИК<sup>7</sup> с 09 Б 67/24, заявл. 02.07.1999; опубл. 09.01.2001.
2. Ойдинов М.Х., Махсумов А.Г., 3-метилфенил-азо-5 цианфенилнинг ҳосиласини синтези ва бўёвчилик фаоллиги// “Умидли кимёгарлар-2014”, XXIII НТК, Ташкент, 2014, стр.90-91.
3. Худойкулова Р.З., Норбоева Ш.Н., Худойбердиев Т.А., Махсумов А.Г. синтез и свойства 2-гидрокси 1-(3<sup>1</sup>,4<sup>1</sup>-дихлорфенил-азо)-нафталина// “Актуальные проблемы инновационных технологий химический нефтегазовой и пищевой промышленности”, Ташкент, РНТК, 2014, стр.65-66.