

THE EFFECT OF THE CORROSION INHIBITOR "OLAZOL T₂P" ON PIPELINES⁺

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Abstract:

The corrosion inhibitor "OLAZOL T₂P" belongs to the class of nitrogen-containing cationic surface-active substances and is design for anticorrosive treatment of pipelines and equipment used in oil and gas industry.

The protective effect of olazol T₂P phase film in the water-oil emulsions reaches 85-95% olazol T₂P prevents from corrosion cracking and suppresses the growth of sulfate-reducing bacteria.

المستخلص:

مانع التآكل اولوزول T₂P ينتمي الى المواد الحاوية على النيتروجين ذات السطوح النشطة الموجبة وتستخدم كمادة مضادة للتآكل في الانابيب المستخدمة في صناعة النفط والغاز .

تم دراسة تأثيره على الانابيب والمعدات النفطية ووجد بان تاثير اولوزول T₂P كمانع للتآكل والتشققات النامية كبير جدا" تصل نسبة منع التآكل الى ٨٥ - ٩٥% من خلال البحث المقدم تم وضع مقترحات وتوصيات في كيفية استخدام اولوزول T₂P المانع للتآكل .

Introduction:

Conditions for application of the inhibitor depend upon the object of its application (oil gathering system, oil transportation, water passage, etc.), aqueous phase mineralization, corrosive gases content (O₂, CO₂, H₂S) and hydrodynamic conditions for transportation of the corrosive media. Under the buyer's request during the inhibitor supply the optimal conditions for the Olazol T₂P application may be defined and the working recommendations may be issued. [1, 2]

Olazol T₂P comes in two grades: Grade A which form. The properties of Olazol T₂P forms are given in table-1. Besides on Olazol T₂P concentrate is manufactured (60-70% of the active substance). Which is mixed with oil derivatives till in reaches a form ready to be used, during storage and transportation Olazol T₂P maintains aggregative satiability in the temperature ranging from minus 45°C to plus 50°C. [3, 4]

Experimental:

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Grade A of Olazol T₂P is characterized by an aftereffect and can be applied according to the methods of continuous or fixed-time gap treatment. During continuous loading of the inhibitor the standard concentration of Olazol T₂P, Grade A oil-dissolving form make:

-10-100 g/m³ for the water-cut gathering pipelines,

-50-1000 g/m³ for the receiver pressure maintenance pipelines, during fixed-time-gap loading of the inhibitor the standard concentrations of Olazol T₂P, Grade A are as follows:

-for the water-cut gathering pipelines, the impact loading is 150-200 g/m³ within two days 4-6 times a year and the working loading is 10-50 g/m³.

-for the reservoir pressure maintenance pipelines, the impact loading is 150-300 g/m³ within two days 4-6 times a year and the continuous working loading is 10-20 g/m³.

-For the downhill underground equipment, (0.4 ± 0.8) m³ of the inhibitor was injected on" within two months.

1. Aggressiveness of the pumped fluid before inhibition (test values) and in the presence of the inhibitor was determined by a gravimetric method. The corrosion rate was evaluated.
2. Different loadings of the inhibitor according to the fixed –time-gap loadings methods were tested at the chosen pipeline sections.
3. The obtained test results are presented in tables 1 and 2

Results & Discussion:

From the results shown in table (1) we can conclude that T₂P, Grade A is successfully applied at the oil & gas fields. Long application of Olazol T₂P has led to a drastic decrease of pipeline breaks; Olazol T₂P is also successfully applied in oil industry. The comparison bench tests conducted has shown the best degree of protection during utilization of Olazol T₂P (Table 2).

A new water-dispersed form of Olazol T₂P, Grade B inhibitor is different from Grade A in the composition of its volatile part. The inhibitor is manufactured from the standard high-quality raw material and is characterized by a constant composition, when mixed with bottoms water Olazol T₂P, Grade B forms a stable-dispersion. It is more effective to use Grade B during continuous loading in the system of oil-gathering collectors and pressure pipelines under the condition of low-velocity flows in the spitting flow modes and also in the systems of reservoir Pressure maintenance. Recommended standard concentrations of the inhibitor during its continuous loading are the following; impact loading is 50-80 g/m³, working loading is 5-15 g/m³. The water dispersed form of Olazol T₂P has successfully passed bench tests in Olazol T₂P concentrate may be used for making conserving agents to protect metal structures from the atmosphere. For the inhibitor there are specifications, toxicological certificate, sanitary certificate and an authorization to use with the oil added T₂P corrosion inhibitor storage.

Olazol T₂P corrosion inhibitor is recommended to be used to protect oil-gathering pipelines according to the method of its fixed-time-gap loading with the following specific consumption impact loading is 200 g/t within two days and working loading is 15 g/t within 14 days. Protection effect ranges from 85% to 93%.[5, 6]

Conclusions:

1. The method is designed for corrosive protection of the inner surface of steel pipeline which are intended for transportation of the oilfield fluids.
2. Olazol T₂P corrosion inhibitor can be used to protect oil-gathering pipelines according to the method of its continuous and fixed-time-gap loading.
3. Olazol T₂P concentrate may be used for making conserving agents to protect metal structures from the atmosphere corrosion.

For the inhibitor there are specifications toxicological certificate sanitary certificate and an authorization to use with the oil added.

Table (1): shows the properties of olazol T₂P

No	Attribute	Standard	
		Grade A	Grade B
1	Appearance at 20°C	Movable fluid of light brown to dark brown color opalescence is tolerated	
2	Mass fraction of non-volatile substance(oftheir, active portion), minimum, %	25	
3	Amine number, mg of Hcl/g, minimum	30	
4	Chilling temperature ,°C, maximum	Minus 45	
5	Dynamic, viscosity according to viscosimeter VPZh-2at 20oC,Mpa.s,Minimum	2.5	
6	Density at 20°C,g/m ³ , minimum	0.86-0.91	0.82
7	Distribution factor in water-oil 2-phase media at oil entering of 50% at 20°C ,maximum	2.0	
8	Protective effect of the inhibitor (Z,%) in the mineralized hydrogen sulfide containing media at concentration of 50 mg/m ³ , in terms of the active substance, minimum	85	

Table(2): the bench test results compare the attributes

NO.	Corrosion inhibitor	Loading g/l	Protective effect %
1	Olazol T2	25	98
2	K-143	25	98
3	SMPJH-4601	25	91

4	VNPP-1	25	90
5	5VNPP-1	25	86
6	7Record-602	25	86
7	Alpan	25	81
8	SNPKh-1004	25	76
9	SNPKh-6301	25	63
10	SNPKh-6302	25	42
11	SNPKh-4501	25	42
12	IKS-1	25	25
13	SNPKh-6014-MS	25	25
14	Back ground value corrosion rat		Average

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