

## Test Results of Compositional Products Taken based on Oil Bitumen

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### Abstract

In this thesis it is proposed that corrosion products, when passing oxidized surfaces of metal surfaces, form compounds on the surface instead of iron oxides. All the demonstrated compositions differ from other analogs with some characteristics, including, components of created compositions are all local industrial waste products; they are all done in an easy technology; and the higher effectiveness in multi-compositional salty condition.

**Keywords:** Gossypol gum; Surface active agents; Corrosion inhibitors; Phosphate acid; Crystals; Furfuryl alcohol; Electrochemical processes

### Introduction

Corrosion products of this composition appear in the form of crust or barrier instead of iron oxides in the process of passivation of oxidized parts of metal surfaces. These crusts are connected chemically with metal bases and consist of the small microscopic-sized crystals that grow jointly [1]. There was necessity for adding surface-active matters, acid-corrosion inhibitors and other compounds to the structure of no oil bitumen based on Gossipol resin in order to synthesize anti-rust coverings, in maximal level and with no any defects. Extractive phosphate acid, hexamethylenetetramine, furfural alcohol, hydrolysis lignin are the substances that possess that kind of characteristics [2]. It can clearly be seen that the new synthesized composition forms the compound of  $H_3PO_4 \cdot (CH_2)_6N_4$  in itself.

Complicated mechanistic electrochemical processes are considered to be the base of corrosive disintegration. According to the years-lasting research, in breaking this mechanism- namely, in creating implements against metal corrosion, it is recommended to use multi-compositional compositions [3].

### Methods

No oil bitumen based on Gossipol resin, furfural alcohol, extractive phosphate acid and hexamethylenetetramine is taken as the main sources of this work [4]. The main reason of using no oil bitumen on the basis of Gossipol resin as a means of anti-corrosion is that it constitutes in itself the functional group of phenol, carboxyl and hydroxyl, which has characteristic feature of forming complex chelate compounds with iron ions and corrosion products [5]. Two-valent Fe compounds form thin crusts in the shape of thin-sewed structure on the surfaces that are based on this structure (Figure 1).

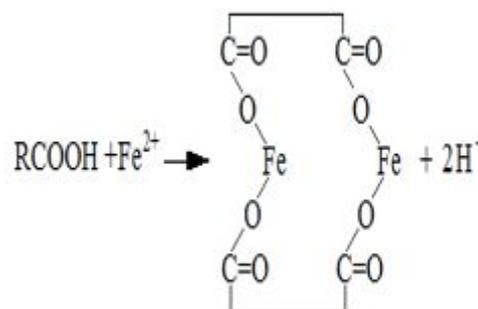


Figure 1: Structure of hexamethylenetetramine.

In addition to this, the hexamethylenetetramine in the structure serves to protect this stable crust from acid aggressions for a long time [6]. According to the test results on that field, it shows great increase in the dimension of polarization resistance and stationary potentiality of metal moves to positive when the surfaces of metal are done with that composition.

### Materials and Results

It is recently found out that adding the extractive phosphate acid to the composition leads to increase the effectiveness of influence on protecting the metals on multi-compositional salty conditions.

According to the information gained in latest research and standard requirements, it is proved the opportunity of taking new competitive compositions that can compensate for import and effectively protect the metals from corrosion in multi-compositional salty conditions [7-10].

Electrochemical tests were held after impacting aggressive condition to the samples. They were held with 3 similar samples in 3 different periods during 90-540 days by keeping [11,12]. Corrosive state of metals is estimated according to the nature of curved line of anode polarization. From the results above, it is found that there will be crust, which includes synergic character in itself that forms the thin stable

crust on the surface of metal and bearable to corrosion and be able to form adhesive layer with metal on the created covering.

All the suggested structures provide the disappearance of rust on the outer surface of metals almost 100% in 20-30 days according to the depth of corrosion.

## Conclusion

Practical research shows that without the passivation of metal, it creates the possibility of both having phosphate and providing an effective anti-rust solution at one stage. Besides being economical, this composition helps to make the process easier and gives opportunity to the increase in protection function of covering. According to our research results, it is acceptable to hold the process of making covering in 20-40°C; in higher temperatures (45-50°C) formation of covering increases, but it may lead to have cracks on the coverings of metal surface. That is the reason why optimal temperature is recommended. During the technical operations, although they have been kept more than 9 months, there have not been any signs of corrosion on the polished details, but it has increased the stability of layer.

All the demonstrated compositions differ from other analogs with some characteristics, including, components of created compositions are all local industrial waste products; they are all done in an easy technology; and the higher effectiveness in multi-componential salty condition.

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