

**MALEIN AGIDIRID, MONOETANOLAMIN VA FOSFAT KISLOTA MMF-2
MARKALI KOMPOZIT KORROZIYA INGIBITORINING SINTEZI**

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Abstract. This article studies the synthesis of corrosion inhibitor based on maleic anhydride, monoethanolamine and phosphoric acid. The composition of the obtained corrosion inhibitor was analyzed using IR spectra.

Key words: maleic anhydride, monoethanolamine, phosphoric acid, corrosion inhibitor.

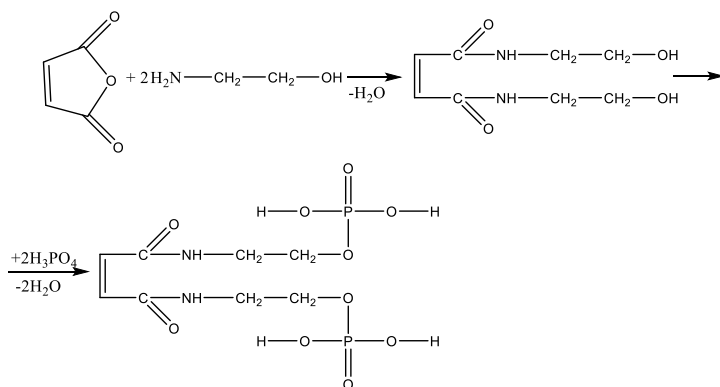
INTRODUCTION

One of the best ways to protect metals from corrosion is the use of corrosion inhibitors. The use of inhibitors can only slow down corrosion, but cannot completely stop it[1,2]. Corrosion is one of the processes that cause great damage not only to industry, but also to material and spiritual heritage. According to their types, corrosion inhibitors are divided into anodic, cathodic and mixed corrosion inhibitors [3,4]. In general, there are several types of corrosion, which are characterized by the source of origin and properties. In preventing corrosion, the use of corrosion inhibitors can allow us to use structures for a relatively longer period of time, but it cannot completely eliminate this problem [5,6].

Experimental part

This reaction is the opposite of the above process, that is, the process proceeds with the release of a large amount of heat. It is explained that one of the main reasons for this is not only the high reaction activity due to the presence of two functional groups in the

composition. Based on this property, a 500 ml flask with a flat bottom is taken, first 2 moles (122 g) of monoethanolamine are poured into it and the system is cooled in the presence of cooling agents (mainly chilled water). While stirring the reaction mass, 1 mole (98) of maleic anhydride is slowly added to the reaction mixture. The mixture was stirred for 45 minutes and the intermediate product was obtained in 92.5% yield (Figure 1). 1 mol (98 g) of phosphoric acid is slowly added dropwise to the intermediate product obtained on the basis of monoethanolamine and maleic anhydride, while stirring.



Thermal analysis of MMF-1 composite corrosion inhibitor

The resulting intermediate product has the following physicochemical properties:
Table-2.1.

Physico-chemical properties of MMF-2 brand corrosion inhibitor

No	Aggregate status	pH	Densityg/sm ²	Solvent
MMF-2	An interesting colored, dark substance	5,4	1,37	In hot water

The obtained reaction product was analyzed by IR-spectra methods.

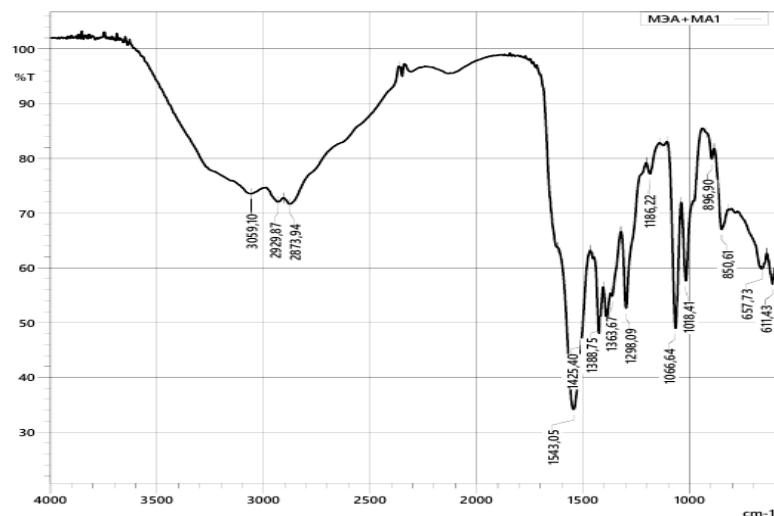


Figure 2.1. IR-spectrum of the intermediate product of MMF-2 corrosion inhibitor.

From the IR spectrum analysis of the intermediate product of MMF-2 corrosion inhibitor, we can see that the valence vibrations of the OH group were observed in the broad and intense absorption region of 3059.10cm^{-1} . Valence vibrations of -C-N- bonds to the area $1298.09\text{-}1182.62\text{ cm}^{-1}$, asymmetric valence vibrations of -C-O-C- bonds in the area 1298.09 cm^{-1} , valence, intensive vibration frequencies of -C-OH groups 1186.22 cm^{-1} valence and intensity fluctuations were observed in the range of area.

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