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CORROSION INHIBITION

Roger F. Monroe, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich., a corporation of Delaware

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5 Claims. (Cl. 21—2.5)

The present invention relates to corrosion inhibition and is more particularly concerned with the inhibition of corrosion of metallic surfaces subjected to acid conditions.

It is an object of the present invention to provide a material which can be added to acid solutions and which material will prevent the corrosion of metal surfaces which come into contact with the acid solution. A further object of the present invention is to provide a relatively non-toxic material which exhibits good corrosion inhibition of metallic surfaces when added to acid solutions. These and other objects will become apparent to those skilled in the art from the following specification and claims.

It has now been found that 2-(2-propynyloxy)tetrahydropyran when added to acid solutions will prevent the corrosion of metallic surfaces such as the ferrous metals, black iron, the stainless steels, nickel, and the like, which come into contact with the acid. Good results are obtained when employing from 0.1 to 1.0 percent by weight of 2-(2-propynyloxy)tetrahydropyran in the acid solution and temperatures below about 200° F.

In carrying out the present invention 2-(2-propynyloxy)tetrahydropyran is added to an aqueous solution of a non-oxidizing acid such as hydrochloric acid, phosphoric acid or sulfuric acid in an amount of from 0.1 to about 1.0 percent by weight.

It is to be understood that both dilute and concentrated aqueous acids, even including the commercial concentrated acids, are inhibited in accordance with the present invention.

The following example is illustrative of the present invention but is not to be construed as limiting.

Example

0.4 percent by weight of 2-(2-propynyloxy)tetrahydropyran was added to aqueous 10 percent and aqueous 15 percent hydrochloric acid, respectively. A piece of 1010 steel was weighed, and then deposited in each of the acid solutions. The mixtures were heated and corrosion data obtained after 16 hours. The results of such tests are reported below.

Hydrochloric Acid	Temp., ° F.	Corrision Rate (Lbs./sq. ft. day)
10 percent	150	0.0043
	175	0.0023
15 percent	200	1.2

It is thus apparent that the compound of the present invention is operative to prevent the corrosion of metal in contact with a non-oxidizing acid, such as sulfuric, acetic or phosphoric, for example, and at temperatures as high as about 200° F.

A major advantage of the inhibitor of the invention is that it is easily and safely handled and used because of its low toxicity, low volatility and lack of irritant properties.

I claim:

1. A metallic-corrosion-inhibited acid which comprises an aqueous solution of non-oxidizing acid and from 0.1 to 1.0 percent by weight of 2-(2-propynyloxy)tetrahydropyran.

2. A method for the prevention of corrosion of ferrous and nickel containing metallic surfaces by non-oxidizing acids at temperatures below about 200° F. which comprises the steps of introducing into an aqueous solution of a non-oxidizing acid from 0.1 to 1.0 percent by weight of 2-(2-propynyloxy(tetrahydropyran and subsequently contacting said so-inhibited acid with metallic surfaces.

3. A method for the prevention of corrosion of ferrous metallic surfaces by non-oxidizing acids at temperatures below about 200° F. which comprises the steps of introducing into an aqueous solution of a non-oxidizing acid from 0.1 to 1.0 percent by weight of 2-(2-propynyloxy)tetrahydropyran and subsequently contacting said so-inhibited acid with said metallic surfaces.

4. A method for the prevention of corrosion of steel surfaces by non-oxidizing acids at temperatures below about 200° F. which comprises the steps of introducing into an aqueous solution of a non-oxidizing acid from 0.1 to 1.0 percent by weight of 2-(2-propynyloxy)tetrahydropyran and subsequently contacting said so-inhibited acid with said metallic surfaces.

5. A method for the prevention of corrosion of nickel containing surfaces by non-oxidizing acids at temperatures below about 200° F. which comprises the steps of introducing into an aqueous solution of a non-oxidizing acid from 0.1 to 1.0 percent by weight of 2-(2-propynyloxy)tetrahydropyran and subsequently contacting said so-inhibited acid with said metallic surfaces.

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