United States Patent Office 2,905,644 Patented Sept. 22, 1959



2,905,644

# ANTICORROSION AGENT

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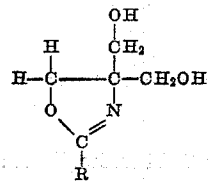
No Drawing. Application July 24, 1956
Serial No. 599,681

4 Claims. (Cl. 252—392)

My invention relates to corrosion inhibiting compositions and more particularly it is concerned with an anticorrosion composition containing as an essential active ingredient a substituted oxazoline having the formula



where R is one of the group consisting of $C_{17}H_{35}$ and $C_{17}H_{33}$, and to a process for preventing corrosion therewith.

Many different agents have been discovered which are effective corrosion inhibitors under limited conditions. However, since no acceptable theory has been advanced to delineate the mode of operation of corrosion inhibitors, extensive experimentation is required to develop inhibitors having special properties which can be utilized for a particular purpose.

I have now discovered that certain oxazolines impart to ferrous metals resistance to attack by a variety of corrosion agents in both acidic and basic solutions.

The word ferrous used in this application is to be interpreted as iron containing and does not mean iron in the bivalent state.

My new compositions utilize as the essential active ingredient 2 - (8-heptadecenyl) - 4,4 - bis(hydroxymethyl)-2-oxazoline or 2-heptadecyl-4,4-bis(hydroxymethyl)-2-oxazoline dissolved in an oil base. The oxazolines employed in my invention are conveniently produced by reacting tris(hydroxymethyl)amino methane with oleic or stearic acid in approximately equimolar quantities. The temperature employed in carrying out the reaction is preferably maintained between 160 and 185° C. The initial stage of this reaction yields an amide corresponding to the desired product, after which the temperature is increased to approximately 215° C., or higher, thereby resulting in the thermal elimination of one equivalent of water to give the desired oxazoline. Generally, the oxazolines can be produced according to the process described in U.S. Patent 2,402,791.

I have found that I can employ either crude or refined mineral or vegetable oils as the inert base of my corrosion inhibiting composition. In preparing my new composition, I can incorporate from 0.04 to 10% by weight of the active ingredient in the inert oil base by any convenient means. I prefer to employ about 1% by weight of the oxazoline in my new composition.

To illustrate the effectiveness of my invention, the following examples are set out; however, I do not intend to be limited to the particular materials, procedures or amounts set forth but rather I intend for all equivalents obvious to those skilled in the art to be included within the scope of my specification and claims.



## EXAMPLE I

A series of static water drop tests were conducted employing a procedure described by Baker, Jones, and Zisman in Industrial and Engineering Chemistry, vol. 41, pages 137–144 (1949). Generally, the test consisted of submerging a test specimen; prepared by depressing the center portion of a triangular piece of 1/32 inch S.A.E. 1020 cold rolled steel, polishing the depression to a mirror finish, and bending the corners of the triangle down to form legs; in a beaker containing the composition of my invention and injecting 0.2 ml. of water into the depression. The containers were covered and placed in a constant temperature oven at 160° F. and visually inspected at intervals.

The following table sets out the results of the above-described tests showing the condition of the test specimens while submerged in compositions of my invention containing varying amounts of the active agents at the end of various time periods up to 351 hours when the tests were ended.

*Table I*

| Active agent | Concentration in mineral oil, percent weight | Time in Hours | | | |
|---|---|---|---|---|---|
| | | 14 | 135 | 168 | 351 |
| 2-(8-heptadecenyl)-4,4-bis(hydroxymethyl)-2-oxazoline. | 0.025 | B | C | ------ | |
| | 0.04 | A | A | A | A |
| | 0.1 | A | A | A | A |
| | 0.3 | A | A | A | A |
| 2-heptadecyl-4,4-bis(hydroxymethyl)-2-oxazoline. | 0.1 | A | A | A | A |
| Oil and water control | 0.0 | C | ------ | ------ | |

A—Test area of disk bright.
B—Test area bright except for 1 small rust spot. This failure may result from an imperfect disk.
C—Test area of disk completely rusted.

## EXAMPLE II

The results of a test utilizing a procedure described in Corrosion, vol. 11, No. 3, pages 143t–146t (1955), demonstrate the efficacy of my new composition in the presence of hydrosulfuric acid. The test described is a static oil and water test wherein mild steel coupons are contacted with a brine containing hydrosulfuric acid. The weight loss of a coupon coated with my new composition is compared with the weight loss of a coupon coated with the inert oil base of my new composition.

The per cent protection effected by use of my compositions is set out below.

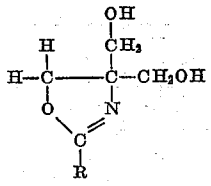
*Table II*

| Compound | Concentration of inhibitor in mineral oil, p.p.m. | Percent protection in test |
|---|---|---|
| 2-(8-heptadecenyl)-4,4-bis(hydroxymethyl)-2-oxazoline | 100 | 96.6 |
| 2-heptadecyl-4,4-bis(hydroxymethyl)-2-oxazoline | 100 | 97.2 |

Now having described my invention, what I claim is:

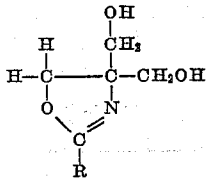
1. A corrosion inhibiting composition comprising a mineral oil solvent in a major amount, based on the weight of the composition, and from about 0.04% to

10% of a substituted oxazoline having the structural formula



where R is a radical selected from the group consisting of $C_{17}H_{35}$ and $C_{17}H_{33}$.

2. A corrosion inhibiting composition comprising a vegetable oil solvent in a major amount based on the weight of the composition, and from about 0.04% to 10% of a substituted oxazoline having the structural formula

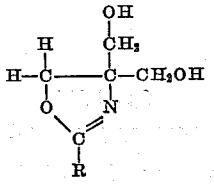


where R is a radical selected from the group consisting of $C_{17}H_{35}$ and $C_{17}H_{33}$.

3. A process for the prevention of corrosion to ferrous metal surfaces which comprises applying to the ferrous metal surfaces a composition comprising a mineral oil

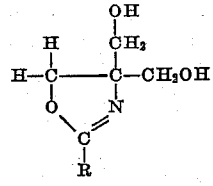


containing from 0.04% to 10% of a substituted oxazoline having the structural formula



where R is a radical selected from the group consisting of $C_{17}H_{35}$ and $C_{17}H_{33}$.

4. A process for the prevention of corrosion to ferrous metal surfaces which comprises applying to the ferrous metal surfaces a vegetable oil containing from 0.04% to 10% of a substituted oxazoline having the structural formula



where R is a radical selected from the group consisting of $C_{17}H_{35}$ and $C_{17}H_{33}$.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