Inhibition of galvanic corrosion by use of mixtures containing RE trivalent ions and organic compounds.

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The combination of different materials in the same structure or equipment is common in modern engineering. With it comes the risk of galvanic action between those materials. A galvanic coupling of prime technological importance is that between zinc and iron as in galvanized steel. Often the corrosion of the zinc layer may be decreased, extending the service life and still keeping the protective galvanic action, when the ferrous substrate becomes exposed.

The aim of this work is to reveal the actions of mixtures of cathodic and anodic inhibitors (rare earth ions and triazole derivatives, respectively) towards the corrosion of different galvanic couples. For such purpose, these mixtures are intended to affect both electrodes in tandem.

The work was conducted using ZRA (Zero Resistance Ammeter) measurements, in a conventional configuration and in some selected cases in a split-cell configuration that enabled to separate the inhibition effect over anodes and cathodes.

It has been found that the mixtures can vary in terms of the nature of the interactions. Also, it is shown that, in some cases, the synergistic effect occurred when both inhibitors where in the cathode compartment. Little effect was observed when the mixture in the anode compartment, or the anodic inhibitor in the anode and the cathodic inhibitor in the cathode.

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