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Drugs/Antibiotics as potential corrosion inhibitors for Metals - A Review

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Abstract : Corrosion protection of metals and alloys is a prime activity of technical, economic, environmental, and aesthetical significance. The use of inhibitors is one of the best choice of combating metals and alloys against deterioration against environmental impact. The toxicity of organic and inorganic corrosion inhibitors to the environment has provoked the search for eco-friendly corrosion inhibitors like green corrosion inhibitors as other more environmental friendly corrosion inhibitors, most of which are biodegradable and do not possess heavy metals or other harmful functional atoms and groups in their molecular structure. Antibiotic is believed to have the efficacy to retard corrosion of several metals such as carbon steel, Aluminium, zinc, tin and copper. It behaves as an inhibitive agent in different corrosive media. Numerous techniques such as Mass loss method, Electro chemical polarization study and AC impedance spectra have been used to evaluate the corrosion inhibition performance of antibiotics. The formation of corrosion inhibitor barrier layer has been analysed by IR spectroscopy, atomic force microscopy, scanning electron microscopy and Auger electron spectroscopy. Adsorption of antibiotics on metal and alloy surfaces obeys Langmuir, Temkin isotherm, depending on nature of metal and corrosive environment and adsorption could be of chemisorption, physisorption or both processes. Electrochemical Polarization study pointed out that that antibiotics can follow anodic or cathodic or mixed mode of inhibition based on chemical nature of metals and operating environment. This paper reckons several antibiotics being used as inhibitors against corrosion of metals in different environments.

Keywords : corrosion, inhibitors, drugs, antibiotics, electrochemical.

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