



Corrosion Control Through Organic

Stoyko Fakirov *

The surface potential of a metal could even be a measure of its activity. These reactions tend to form an electrical double layer at the surface which establishes an electrical potential. The more positive metals are said to be nobler and fewer reactive, while the more negative metals are called base metals and are highly reactive. The standard potential of metals is given within the next table termed the quality voltage series. It should be made clear however that a metal's actual potential are often greatly altered by its environment. As we've observed, corrosion reactions inevitably involve electron transfer. For this reason, the reactions could even be considered electrochemical in nature. Thermodynamics can provide a basis for the understanding of the energy changes associated with the corrosion reaction. It can, generally, predict when corrosion is feasible. Thermodynamics cannot predict corrosion rates. The speed at which the reaction proceeds is governed by kinetics.

On the opposite hand, "if the amount of the oxide could also be a smaller amount than the amount of metal, the oxide layer is porous (or non-continuous) and hence, non-protective, because it cannot prevent the access of oxygen to the fresh metal surface below". Thus, alkali and alkaline-earth metal metals (like Li, K, Na, Mg) form oxides of volume but the amount of metals. Consequently, the oxide layer faces stress and strains, thereby developing cracks and pores in its structure. Porous oxide scale permits free access of oxygen to the underlying metal surface (through cracks and pores) for fresh action and thus, corrosion continues non-stop. Metals like Aluminum forms oxide, whose volume is greater than the number of metal. Consequently, a very tightly-adhering non-porous layer is formed. because of the absence of any pores or cracks within the oxide film, the speed of oxidation rapidly decreases to zero.

Even though the essential mechanism of corrosion involves creation or existence of corrosion cells, there are several types or sorts of corrosion which may occur. It should however be borne in mind that for corrosion to occur, there is no need for discrete (physically independent) anodes and cathodes. Innumerable micro

level anodic and cathodic areas are often generated at an equivalent (single) surface on which anodic (corrosion) and cathodic (reduction) reactions occur. Pitting corrosion could even be a localized phenomenon confined to smaller areas. Formation of micro-pits is often very damaging. Pitting factor (ratio of deepest pit to average penetration) is often wont to evaluate severity of pitting corrosion which is typically observed in passive metals and alloys. Concentration cells involving oxygen gradients or ion gradients can initiate pitting through generation of anodic and cathodic areas. While chromate could even be a robust inhibitor of corrosion on many metallic surfaces, it's carcinogenic. Thus, the search has been to hunt out an inhibitor that's as effective as chromate, but environmentally benign. This needs interdisciplinary work involving chemistry, electrochemistry, surface science, and metallurgy. Because the infrastructure of industrialized countries continues to age, more and more failures because of corrosion are occurring. Replacing all the bridges and pipelines (gas, oil, and water) would be prohibitively expensive, and unnecessary as most are in fitness and will provide more years of service. Deciding which of them are failing and therefore the way long they're going to last is that the function of service life prediction.

Author Affiliation

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Department of Mechanical Engineering, The University of Auckland, New Zealand

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*Corresponding author: Stoyko Fakirov, Department of Mechanical Engineering, The University of Auckland, New Zealand, E-mail: s.fakirov@auckland.ac.nz

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