

Corrosion: Metal/Environment Reactions; Newnes, 2013; 9781483164106; 1232 pages; 2013; L L Shreir

Corrosion handbook. The overall reaction can be separated in two partial reactions: $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}^-$ Metal dissolution, also known as oxidation or anodic reaction, and $\text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-$ Reduction or cathodic reaction, a reaction mainly involving the oxygen present in the air with water. These two partial reactions can take place on the metal surface in a fairly homogeneous distribution leading to uniform attack (see section 1.2.1) or can occur locally and separately, leading to localized forms of corrosion such as pitting corrosion. It is well known that certain grades of austenitic stainless steel can suffer stress corrosion cracking in harsh environments such as indoor swimming pools. In most of these cases, corrosion is initiated by chlorides attacking the passive layer. page 10. Corrosion is a natural process that converts a refined metal into a more chemically stable form such as oxide, hydroxide, or sulfide. It is the gradual destruction of materials (usually a metal) by chemical and/or electrochemical reaction with their environment. Corrosion engineering is the field dedicated to controlling and preventing corrosion. In the most common use of the word, this means electrochemical oxidation of metal in reaction with an oxidant such as oxygen or sulfates. Rusting, the (1994) Corrosion Metal/Environment Reactions. Vol. 1, 3rd Edition, Heinemann Ltd., Butterworth, London, 4-60. has been cited by the following article: TITLE: An Experimental Study on Using Laser for Cleaning Metal Threads. AUTHORS: Neama A. Shehata, Mohamed A. Marouf, Badawy M. Ismail. The present study aimed to investigate and evaluate laser cleaning of the corroded metal embroidery, revealing the chemical composition of the corrosion and product and evaluating the effects of laser cleaning on the surface of the metal threads. It utilized SEM and LM to provide morphological information about the surface and the cleaning effect. Moreover, SEM-EDX was used to define the elemental composition, and XRD was employed to offer information on the metal. Corrosion theory for metals. Corrosion is defined as an attack on a material as a result of chemical, frequently electrochemical reaction, with the surrounding medium. According to this definition, the term corrosion can be applied to all materials, including non-metals. But in practice, the word corrosion is mainly used in conjunction with metallic materials. Why do metals corrode? Electrochemical corrosion on the other hand takes place by electrode reactions, often in humid environments, i.e. wet corrosion. All metals in dry air are covered by a very thin layer of oxide, about 100 Å (10-2 μm) thick. This layer is built up by chemical corrosion with the oxygen in the air.