



" CORROSION OF MECHANICALLY DAMAGED SURFACES "

DISSERTATION

ON THE

RESEARCH PROJECT

SUBMITTED AS A PARTIAL FULFILMENT

FOR THE

MASTER OF SCIENCE

DEGREE IN ANALYTICAL CHEMISTRY

BY

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INTRODUCTION

Corrosion:

Corrosion can be defined as the destructive attack of a metallic material due to the interaction with the environment. The corrosion product may be solid or liquid. Both physical and chemical nature of the products are important since they frequently influence the subsequent rate of reaction.

The study of corrosion needs neither justification nor explanation. Every metal producer and user is forced to undertake it. The amount of money spent in an industrial country in combating corrosion by preventive measures, e.g., plating or painting by replacement of corroded parts, by the use of expensive alloys, etc., is extremely high. Estimates of this sum, just for United Kingdom alone go as high as £1,365 million per annum. The corrosion of metal therefore represents a terrible waste of both natural resources and money.

Corrosion studies are undertaken by all types of physical scientists and any investigator needs to understand the language of each if he is to make full use of previous work and to integrate this with his own. Although the semiconductivity of oxides, electrochemical kinetics and surface dislocation arrangements are usually studied by engineers, physicists, electrochemists and metallurgists all are of considerable importance ~~in satisfying~~ in studying corrosion reaction. The outlook of the corrosion scientist quite independent of his training must be truly interdisciplinary and this breadth helps make corrosion a particularly fascinating subject.

It is an interesting fact that a piece of metal remains stable for an almost indefinite period of time provided that it is stored in a vacuum. It appears that metals acquire stability when their surfaces are isolated from normal terrestrial environment.