PREFACE

Considerable progress has been made in the rapidly developing science of corrosion and protection of metals and various new methods for improving the corrosion resistance of metals and alloys have become available within the past two decades. Introduction of anodic protection with the help of applied electric current has been established as an effective new technique for corrosion control, and potentiostatic polarization data have greatly helped in evaluating metal-electrolyte systems for anodic protention. For electrochemical corrosion testing, various experimental techniques have been developed and along with the standardization of these techniques, these are being utilised for collecting data of practical metal-electrolyte systems.

The work reported in this thesis comprises of potentiostatic as well as intentiostatic polarization studies of several steels in 1% H_2SO_4. An extraordinary quantity of potentiostatic polarization data have been generated within the last few years. It has not been possible to present in this thesis a complete literature survey; only the pertinent literature is cited in Chapter II.

In Chapter III the experimental procedure followed in this investigation has been outlined. A new method for finding out the instantaneous corrosion rate has also been

suggested. This method which does not require any prior knowledge of the Tafel constants is expected to be useful for a quick computation of the corrosion rate from polarization data.

Chapter IV of this thesis contains polarization data of several alloy steels which have not been reported before. An attempt has been made to correlate the various electrochemical parameters with the composition and microstructure of the steels.

The conclusions drawn from the present work have been listed in Chapter VI. The informations recorded about the behaviour of the steels under investigation is expected to be of some use to the corrosion engineers.

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