

CONTENTS

	<u>Page</u>
INTRODUCTION	1
A- Corrosion Behaviour of Copper in Aqueous Solutions	6
B- Passive Film Formation	18
C- Breakdown of Passivity	21
D- The use of Organic Inhibitors in Corrosion Reaction	23
E- Aim and Scope of the Present Work	29
PART I	
VARIATION OF THE POTENTIAL OF THE COPPER ELECTRODE IN AQUEOUS SOLUTIONS UNDER OPEN CIRCUIT CONDITIONS	
	34
A- Introduction	34
B- Experimental	36
C- Results	39
D- Discussion	41
1. Variation of the potential of copper electrode in saturated salt solutions	41
2. Amount of the aggressive anions that can be tolerated by certain passivators	49
PART II	
CORROSION BEHAVIOUR OF COPPER AS REVEALED FROM THERMOMETRIC MEASUREMENTS	
	57
A- Introduction	57
B- Experimental Technique	59
C- Results	61

	<u>Page</u>
D- Discussion	63
1. Effect of inorganic additives on the dissolution of copper in HNO ₃	66
2. Effect of alkylamines on the dissolution of copper in HNO ₃	68

PART III

ELECTROCHEMICAL BEHAVIOUR OF COPPER AS REVEALED FROM CYCLIC VOLTAMMETRY AND POTENTIODYNAMIC POLARIZATION	73
A- Introduction	73
B- Experimental	75
C- Results	77
D- Discussion	80
1. Effect of scanning rate	84
2. Effect of sodium carbonate concentration	85
3. Susceptibility of copper to pitting corrosion by chloride ions	86
4. Variation of the pitting corrosion potential with chloride ion concentration	89
5. Inhibition of pitting corrosion by some inorganic compounds	95
6. Concentration of the aggressive anion that can be tolerated by a certain anion concentration	100
GENERAL REMARKS AND CONCLUSION	104
SUMMARY	107
REFERENCES	111
SUMMARY IN ARABIC	