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จุฬาลงกรณ์มหาวิทยาลัย

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COMPLEX FORMATIONS BETWEEN SOME FOOD DYES
AND THE TRANSITION METAL IONS OF THE FIRST ROW



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บทคัดย่อ

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Thesis Title Complex Formations between Some Food Dyes and the
 Transition Metal Ions of the First Row

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ABSTRACT

In this thesis, the appropriate conditions for the food dyes; Azorubine, Sunset Yellow FCF, Orange G, Orange RN, Tartrazine and Green S to react with some transition metal ions of the first row such as Ti (IV), Cr (III), Mn (II), Co (II), Fe (II), Fe (III), Ni (II), Cu (II) and Zn (II) ions were investigated by spectrophotometric technique. The food dyes used are of high purity; using spectrophotometric and chromatographic tests, their percentage of purities are over 85. The buffer systems used were phosphate buffer, acetate buffer, McIlvaine buffer, acetic acid, phosphoric acid and diethylamine. It was found that every metal ion could not react with every dye studied, except Cu (II) ion. The Cu (II) complexes were found to have the molar ratios of 1:2 for Cu (II)-Azorubine in acetate buffer pH 6.10 and in phosphate buffer pH 5.85 or 7.00, 1:1 for Cu (II)-Azorubine in acetate buffer pH 5.10, 1:1 for Cu (II)-Sunset Yellow FCF in acetate buffer pH 5.10 or 4.00, 2:1 for Cu (II)-Sunset Yellow FCF in acetate buffer pH 6.10, 1:1 for Cu (II)-Orange G or Cu (II)-Orange RN in acetate buffer pH 6.10, 5.10 or 4.00. The stability constants of the complexes were determined. It was found that the stability constants of these complexes were in the order of seventh for 1:1 Cu (II)-Azorubine, Cu (II)-Sunset Yellow FCF, Cu (II)-Orange G or Cu (II)-Orange RN complex and in the order of tenth for 1:2 Cu (II)-Azorubine or 2:1 Cu (II)-Sunset Yellow FCF complex.



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ศูนย์วิทยทรัพยากร
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CONTENTS

| | PAGE |
|--|------|
| ABSTRACT (IN THAI)..... | iv |
| ABSTRACT..... | v |
| ACKNOWLEDGEMENTS..... | vi |
| LIST OF TABLES..... | vii |
| LIST OF FIGURES..... | xii |
| CHAPTER | |
| I INTRODUCTION..... | 1 |
| II EXPERIMENT..... | 14 |
| 2.1 Chemicals and reagents..... | 14 |
| 2.2 Instruments used..... | 14 |
| 2.3 Procedure..... | 15 |
| III RESULTS AND DISCUSSION..... | 28 |
| 3.1 Purities of the dyes..... | 28 |
| 3.2 Separation of Orange RN..... | 33 |
| 3.3 Dye content..... | 48 |
| 3.4 The effect of pH on solubilities of dyes metal ions and their mixtures..... | 48 |
| 3.5 Ultraviolet-visible spectrophotometric characteristics of dyes..... | 55 |
| 3.6 Dependence of absorbances on concentrations of the metal ion solutions..... | 89 |
| 3.7 Complex formations between dyes and metal ions. | 89 |
| IV CONCLUSION AND RECOMMENDATION..... | 233 |
| REFERENCES..... | 237 |
| VITA..... | 241 |

LIST OF TABLES

| TABLE | PAGE |
|-------|--|
| 1 | Rf values of Azorubine, Sunset Yellow FCF, Orange G, Orange RN, Tartrazine and Green S..... 31 |
| 2 | Absorption characteristics of dyes in the visible region..... 40 |
| 3 | Solvent systems and the corresponding Rf values by thin layer chromatography..... 49 |
| 4 | Dye contents of Azorubine, Sunset Yellow FCF, Orange G, Tartrazine and Green S..... 54 |
| 5 | Solubility of the metal ion in various buffer systems... 56 |
| 6 | Absorption characteristics of dyes in aqueous solution in UV-visible region..... 57 |
| 7A | Dependence of absorbances on concentrations of Azorubine at various pH values..... 69 |
| 7B | Dependence of absorbances on concentrations of Tartrazine at various pH values..... 70 |
| 7C | Dependence of absorbances on concentrations of Sunset Yellow FCF at various pH values..... 71 |
| 7D | Dependence of absorbances on concentrations of Orange G at various pH values..... 72 |
| 7E | Dependence of absorbances on concentrations of Orange RN at various pH values..... 73 |
| 7F | Dependence of absorbances on concentrations of Green S at various pH values..... 74 |
| 8A | Dependence of absorbances on pH of Azorubine solutions.. 75 |
| 8B | Dependence of absorbances on pH of Sunset Yellow FCF solutions..... 76 |

LIST OF TABLES (continued)

| TABLE | PAGE |
|---|------|
| 8C Dependence of absorbances on pH of Orange G solutions... | 77 |
| 8D Dependence of absorbances on pH of Orange RN solutions.. | 78 |
| 8E Dependence of absorbances on pH of Tartrazine solutions. | 79 |
| 8F Dependence of absorbances on pH of Green S solutions.... | 80 |
| 9A Dependence of absorbances on concentrations of Azorubine, Sunset Yellow FCF, Orange G, Orange RN and Tartrazine in aqueous solution..... | 87 |
| 9B Dependence of absorbances on concentrations of Green S in aqueous solution..... | 88 |
| 10A Dependence of absorbances on concentrations of Azorubine in various buffer system..... | 90 |
| 10B Dependence of absorbances on concentrations of Sunset Yellow FCF in the acetate buffer..... | 91 |
| 10C Dependence of absorbances on concentrations of Orange G in the acetate buffer..... | 92 |
| 10D Dependence of absorbances on concentrations of Orange RN in the acetate buffer..... | 93 |
| 11 Dependence of absorbances on concentrations of Cu (II) ion in the phosphate and the acetate buffer..... | 98 |
| 12 Absorption characteristics of Azorubine and Cu (II) ion- Azorubine mixtures at various pH values in ultraviolet- visible region..... | 116 |
| 13 Effect of time on the color development of Cu (II)- Azorubine complex in various buffer system..... | 117 |
| 14A Method of continuous variation of Azorubine and Cu (II) ion in the phosphate buffer pH 7.00..... | 121 |

LIST OF TABLES (continued)

| TABLE | PAGE |
|---|------|
| 14B Method of continuous variation of Azorubine and Cu (II) ion in the phosphate buffer pH 5.85..... | 122 |
| 14C Method of continuous variation of Azorubine and Cu (II) ion in the acetate buffer pH 6.10..... | 123 |
| 14D Method of continuous variation of Azorubine and Cu (II) ion in the acetate buffer pH 5.10..... | 124 |
| 15A The Molar ratio study of Azorubine and Cu (II) ion in the phosphate buffer pH 7.00..... | 129 |
| 15B The Molar ratio study of Azorubine and Cu (II) ion in the phosphate buffer pH 5.85..... | 130 |
| 15C The Molar ratio study of Azorubine and Cu (II) ion in the acetate buffer pH 6.10..... | 131 |
| 15D The Molar ratio study of Azorubine and Cu (II) ion in the acetate buffer pH 5.10..... | 132 |
| 16 Absorption characteristics of Sunset Yellow FCF and Cu (II) ion-Sunset Yellow FCF mixtures at various pH values in ultraviolet region..... | 150 |
| 17 Effect of time on the color development of Cu (II) ion-Sunset Yellow FCF mixture in the acetate buffer..... | 154 |
| 18 The molar ratio study of Sunset Yellow FCF and Cu (II) ion in the acetate buffer..... | 156 |
| 19A Spectrophotometric data of the Cu (II)-Sunset Yellow FCF system in the acetate buffer pH 6.10..... | 157 |
| 19B Spectrophotometric data of the Cu (II)-Sunset Yellow FCF system in the acetate buffer pH 5.10..... | 158 |
| 19C Spectrophotometric data of the Cu (II)-Sunset Yellow FCF system in the acetate buffer pH 4.00..... | 159 |

LIST OF TABLES (continued)

| TABLE | PAGE | |
|-------|--|-----|
| 20 | Absorption characteristics of Orange G and Cu (II) ion-Orange G mixtures at various pH values in ultraviolet-visible region..... | 176 |
| 21 | Effect of time on the color development of Cu (II) ion-Orange G mixture in the acetate buffer..... | 181 |
| 22 | The molar ratio study of Orange G and Cu (II) ion in the acetate buffer..... | 183 |
| 23A | Spectrophotometric data of the Cu (II)-Orange G system in the acetate buffer pH 6.10..... | 184 |
| 23B | Spectrophotometric data of the Cu (II)-Orange G system in the acetate buffer pH 5.10..... | 185 |
| 23C | Spectrophotometric data of the Cu (II)-Orange G system in the acetate buffer pH 4.00..... | 186 |
| 24 | Absorption characteristics of Orange RN and Cu (II) ion-Orange RN mixtures at various pH values in ultraviolet region..... | 204 |
| 25 | Effect of time on the color development of the Cu (II) ion-Orange RN mixture in the acetate buffer..... | 205 |
| 26 | The molar ratio study of Orange RN and Cu (II) ion in the acetate buffer..... | 207 |
| 27A | Spectrophotometric data of the Cu (II)-Orange RN system in the acetate buffer pH 6.10..... | 208 |
| 27B | Spectrophotometric data of the Cu (II)-Orange RN system in the acetate buffer pH 5.10..... | 209 |
| 27C | Spectrophotometric data of the Cu (II)-Orange RN system in the acetate buffer pH 4.00..... | 210 |

LIST OF TABLES (continued)

| TABLE | | PAGE |
|-------|---|------|
| 28A | Stability constants of Cu (II)-Azorubine in various buffer..... | 231 |
| 28B | Stability constants of Cu (II)-dye in the acetate buffer at pH 6.10 by the molar ratio method..... | 232 |



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

LIST OF FIGURES

| FIGURE | | PAGE |
|--------|---|------|
| 1 | Continuous variation plot for the complex MX_2 | 8 |
| 2 | Molar ratio plot for the complex MX | 10 |
| 3A | Paper chromatograms of dyes by solvent system I..... | 29 |
| 3B-3C | Paper chromatograms of dyes by solvent system II and III..... | 30 |
| 4A | Comparison of UV-visible spectra of Azorubine between literature and experiment..... | 34 |
| 4B | Comparison of UV-visible spectra of Sunset Yellow FCF between literature and experiment..... | 35 |
| 4C | Comparison of UV-visible spectra of Orange G between literature and experiment..... | 36 |
| 4D | Comparison of UV-visible spectra of Orange RN between literature and experiment..... | 37 |
| 4E | Comparison of UV-visible spectra of Tartrazine between literature and experiment..... | 38 |
| 4F | Comparison of UV-visible spectra of Green S between literature and experiment..... | 39 |
| 5A | IR spectrum of Azorubine in solid KBr pellet..... | 41 |
| 5B | IR spectrum of Sunset Yellow FCF in solid KBr pellet. | 42 |
| 5C | IR spectra of Orange G in nujol mull between litera- ture and experiment..... | 43 |
| 5D | IR spectra of Orange RN in nujol mull between litera- ture and experiment..... | 44 |
| 5E | IR spectra of Tartrazine in solid KBr pellets between literature and experiment..... | 45 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|---------|--|------|
| 5F | IR spectrum of Green S in solid KBr pellet..... | 46 |
| 6 | Thin layer chromatograms of Orange RN..... | 50 |
| 7 | Paper chromatogram of pure Orange RN..... | 51 |
| 8 | Comparison of UV-visible spectra between Orange RN after purification by column chromatography and literature..... | 52 |
| 9 | Comparison of IR spectra between Orange RN after purification by column chromatography and literature. | 53 |
| 10A-10B | Dependences of absorbances on concentrations of Azoru- bine and Sunset Yellow FCF..... | 58 |
| 10C-10D | Dependences of absorbances on concentrations of Orange G and Orange RN..... | 59 |
| 10E-10F | Dependences of absorbances on concentrations of Tartrazine and Green S..... | 60 |
| 11A | Absorption spectra of Azorubine at various pH values. | 63 |
| 11B | Absorption spectra of Sunset Yellow FCF at various pH values..... | 64 |
| 11C | Absorption spectra of Orange G at various pH values.. | 65 |
| 11D | Absorption spectra of Orange RN at various pH values. | 66 |
| 11E | Absorption spectra of Tartrazine at various pH values | 67 |
| 11F | Absorption spectra of Green S at various pH values... | 68 |
| 12A | Determination of pKa value for Azorubine from visible spectrophotometric data..... | 81 |
| 12B | Determination of pKa value for Sunset Yellow FCF from visible spectrophotometric data..... | 82 |
| 12C | Determination of pKa value for Orange G from visible spectrophotometric data..... | 83 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|--|------|
| 12D | Determination of pKa value for Orange RN from visible spectrophotometric data..... | 84 |
| 12E | Determination of pKa value for Tartrazine from visible spectrophotometric data..... | 85 |
| 12F | Determination of pKa value for Green S from visible spectrophotometric data..... | 86 |
| 13A | Dependences of absorbances on concentrations of Azorubine in acetate buffer and phosphate buffer at various pH values..... | 94 |
| 13B | Dependences of absorbances on concentrations of Sunset Yellow FCF in the acetate buffer at various pH values | 95 |
| 13C | Dependences of absorbances on concentrations of Orange G in the acetate buffer at various pH values..... | 96 |
| 13D | Dependences of absorbances on concentrations of Orange RN in the acetate buffer at various pH values..... | 97 |
| 14 | Dependences of absorbances on concentrations of Cu (II) ion in water, phosphate buffer and acetate buffer.... | 99 |
| 15A | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the acetic acid at pH 2.30..... | 101 |
| 15B | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the phosphoric acid at pH 1.00..... | 102 |
| 15C | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the McIlvaine buffer at pH 3.10..... | 103 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|---|------|
| 15D | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the McIlvaine buffer at pH 5.15..... | 104 |
| 15E | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the McIlvaine buffer at pH 7.40..... | 105 |
| 15F | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the phosphate buffer at pH 5.85..... | 106 |
| 15G | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the phosphate buffer at pH 7.00..... | 107 |
| 15H | The UV-visible absorption spectra of the mixture of Azorubine and metal ions in the diethylamine at pH 12.50..... | 108 |
| 15I | The UV-visible absorption spectra of the mixture of Azorubine and Cu (II) ion in the acetate buffer at various pH values..... | 109 |
| 15J | The UV-visible absorption spectra of the mixture of Azorubine and Cu (II) ion in the phosphate buffer at various pH values..... | 110 |
| 16A | The UV-visible absorption spectra of Cu (II)-Azorubine complex in the phosphate buffer at various pH values. | 113 |
| 16B | The UV-visible absorption spectra of Cu (II)-Azorubine complex in the acetate buffer at various pH values... | 114 |
| 17 | Effects of pH on the absorption spectra of the Cu (II)-Azorubine mixture in phosphate and acetate buffer.... | 115 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|---|------|
| 18 | The influence of time on the absorbance of the Cu (II)-Azorubine complex in various pH values..... | 118 |
| 19A | Continuous variation plots for solutions contained various mole fractions of Cu (II) ion in the phosphate buffer pH 7.00..... | 125 |
| 19B | Continuous variation plots for solutions contained various mole fractions of Cu (II) ion in the phosphate buffer pH 5.85..... | 126 |
| 19C | Continuous variation plots for solutions contained various mole fractions of Cu (II) ion in the acetate buffer pH 6.10..... | 127 |
| 19D | Continuous variation plots for solutions contained various mole fractions of Cu (II) ion in the acetate buffer pH 5.10..... | 128 |
| 20A | Molar ratio plots for systems of Azorubine and Cu (II) ion in the phosphate buffer pH 7.00..... | 133 |
| 20B | Molar ratio plots for systems of Azorubine and Cu (II) ion in the phosphate buffer pH 5.85..... | 134 |
| 20C | Molar ratio plots for systems of Azorubine and Cu (II) ion in the acetate buffer pH 6.10..... | 135 |
| 20D | Molar ratio plots for systems of Azorubine and Cu (II) ion in the acetate buffer pH 5.10..... | 136 |
| 21A | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the acetic acid at pH 2.30..... | 139 |
| 21B | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the phosphoric | |

LIST OF FIGURE (continued)

| FIGURE | | PAGE |
|--------|--|------|
| | acid at pH 1.00..... | 140 |
| 21C | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the McIlvaine buffer at pH 3.10..... | 141 |
| 21D | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the McIlvaine buffer at pH 5.15..... | 142 |
| 21E | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the McIlvaine buffer at pH 7.40..... | 143 |
| 21F | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the phosphate buffer at pH 5.85..... | 144 |
| 21G | The UV-visible absorption spectra of the mixture of Sunset Yellow FCF and metal ions in the phosphate buffer at pH 7.00..... | 145 |
| 21H | The UV-visible absorption spectra of Sunset Yellow FCF and Cu (II) ion-Sunset Yellow FCF mixture in the acetate buffer at pH 6.10..... | 146 |
| 21I | The UV-visible absorption spectra of Sunset Yellow FCF and Cu (II) ion-Sunset Yellow FCF mixture in the acetate buffer at pH 5.10..... | 147 |
| 21J | The UV-visible absorption spectra of Sunset Yellow FCF and Cu (II) ion-Sunset Yellow FCF mixture in the acetate buffer at pH 4.00..... | 148 |
| 22 | Effect of pH on the absorption spectra of the Cu (II) ion-Sunset Yellow FCF mixture in the acetate buffer.. | 149 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|---|------|
| 23 | The influence of time on the absorbance of Cu (II) ion-Sunset Yellow FCF mixture at various pH values... | 155 |
| 24 | The plots of Cu (II)-Sunset Yellow FCF systems at pH 6.10..... | 160 |
| 25 | The plots of Cu (II)-Sunset Yellow FCF systems at pH 5.10..... | 161 |
| 26 | The plots of Cu (II)-Sunset Yellow FCF systems at pH 4.00..... | 162 |
| 27A | The UV-visible absorption spectra of the mixture of Orange G and metal ions in acetic acid pH 2.30..... | 165 |
| 27B | The UV-visible absorption spectra of the mixture of Orange G and metal ions in phosphoric acid pH 1.00... | 166 |
| 27C | The UV-visible absorption spectra of the mixture of Orange G and metal ions in the McIlvaine buffer at pH 3.10..... | 167 |
| 27D | The UV-visible absorption spectra of the mixture of Orange G and metal ions in the McIlvaine buffer at pH 5.15..... | 168 |
| 27E | The UV-visible absorption spectra of the mixture of Orange G and metal ions in the McIlvaine buffer at pH 7.40..... | 169 |
| 27F | The UV-visible absorption spectra of the mixture of Orange G and metal ions in the phosphate buffer at pH 5.85..... | 170 |
| 27G | The UV-visible absorption spectra of the mixture of Orange G and metal ions in the phosphate buffer at pH 7.00..... | 171 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|--|------|
| 27H | The UV-visible absorption spectra of the mixture of Orange G and metal ions in the diethylamine pH 12.50 | 172 |
| 27I | The UV-visible absorption spectra of Orange G and Cu (II) ion-Orange G mixture in the acetate buffer at pH 6.10..... | 173 |
| 27J | The UV-visible absorption spectra of Orange G and Cu (II) ion-Orange G mixture in the acetate buffer at pH 5.10..... | 174 |
| 27K | The UV-visible absorption spectra of Orange G and Cu (II) ion-Orange G mixture in the acetate buffer at pH 4.00..... | 175 |
| 28 | Effect of pH on the absorption spectra of the Cu (II) ion-Orange G mixture in the acetate buffer..... | 177 |
| 29 | The influence of time on the absorbance of the Cu (II) ion-Orange mixture at various pH values..... | 182 |
| 30 | The plots of Cu (II)-Orange G systems at pH 6.10..... | 187 |
| 31 | The plots of Cu (II)-Orange G systems at pH 5.10..... | 188 |
| 32 | The plots of Cu (II)-Orange G systems at pH 4.00..... | 189 |
| 33A | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in acetic acid at pH 2.30... | 190 |
| 33B | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in phosphoric acid at pH 1.00..... | 191 |
| 33C | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in the McIlvaine buffer at pH 3.10..... | 192 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|--|------|
| 33D | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in the McIlvaine buffer at pH 5.15..... | 193 |
| 33E | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in the McIlvaine buffer at pH 7.40..... | 194 |
| 33F | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in the phosphate buffer at pH 5.85..... | 195 |
| 33G | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in the phosphate buffer at pH 7.00..... | 196 |
| 33H | The UV-visible absorption spectra of the mixture of Orange RN and metal ions in diethylamine at pH 12.50. | 197 |
| 33I | The UV-visible absorption spectra of Orange RN and Cu (II) ion-Orange RN mixture in the acetate buffer at pH 6.10..... | 198 |
| 33J | The UV-visible absorption spectra of Orange RN and Cu (II) ion-Orange RN mixture in the acetate buffer at pH 5.10..... | 199 |
| 33K | The UV-visible absorption spectra of Orange RN and Cu (II) ion-Orange RN mixture in the acetate buffer pH 4.00..... | 200 |
| 34 | Effect of pH on the absorption spectra of Cu (II) ion-Orange RN mixture in the acetate buffer..... | 203 |
| 35 | The influence of time on the absorbance of the Cu (II) ion-Orange RN mixture at various pH values..... | 206 |

LIST OF FIGURES (continued)

| FIGURE | | PAGE |
|--------|--|------|
| 36 | The plots of Cu (II)-Orange G systems at pH 6.10..... | 211 |
| 37 | The plots of Cu (II)-Orange G systems at pH 5.10..... | 212 |
| 38 | The plots of Cu (II)-Orange G systems at pH 4.00..... | 213 |
| 39A | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in acetic acid at pH 2.30.. | 216 |
| 39B | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in phosphoric acid at pH 1.00..... | 217 |
| 39C | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in the McIlvaine buffer at pH 3.10..... | 218 |
| 39D | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in the McIlvaine buffer at pH 5.15..... | 219 |
| 39E | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in the McIlvaine buffer at pH 7.40..... | 220 |
| 39F | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in the phosphate buffer at pH 5.85..... | 221 |
| 39G | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in the phosphate buffer at pH 7.00..... | 222 |
| 39H | The UV-visible absorption spectra of the mixture of Tartrazine and metal ions in the phosphate buffer at pH 12.50..... | 223 |

LIST OF FIGURES (continued)

| FIGURE | PAGE |
|--|------|
| 40A | 224 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in acetic acid pH 2.30..... | |
| 40B | 225 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in phosphoric acid pH 1.00.... | |
| 40C | 226 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in the McIlvaine buffer at pH 3.10..... | |
| 40D | 227 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in the McIlvaine buffer at pH 5.15..... | |
| 40E | 228 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in the McIlvaine buffer at pH 7.40..... | |
| 40F | 229 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in the phosphate buffer at pH 5.85..... | |
| 40G | 230 |
| The UV-visible absorption spectra of the mixture of Green S and metal ions in the phosphate buffer at pH 7.00..... | |