

CONTENTS

<i>Foreword</i>	(v)
<i>Preface</i>	(vii)

PART - 1 INTRODUCTION

1. Microwave-Assisted Organic Reactions.....	3
1.1 Microwave Heating	4
1.2 Microwave Instrument Components	7
1.3 Microwave Solvents	8
1.4 Microwave Reaction Vessels.....	9
1.5 Microwave-Assisted Chemical Reactions	10
1.6 Microwave Assisted Extraction (MAE)	11
1.7 Safety Precautions	11
1.8 Applications.....	13
2. Important Microwave Reactions.....	15
3. Optimal Conditions for Microwave-Assisted Organic Synthesis	30
4. Special Guidelines	35

PART - 2 ORGANIC SYNTHESIS

Microwave Intensity and Power (Watts)	39
--	-----------

Acetylation

1. Preparation of Aspirin.....	41
2. Preparation of Acetanilide	43
3. Preparation of <i>N</i> -Acetylanisidine	45
4. Preparation of Paracetamol.....	47
5. Preparation of α -Glucose Pentaacetate	49

Esterification

6. Preparation of Benzocaine.....	52
7. Preparation of Butamben	55

Electrophilic Aromatic Substitution

8. Preparation of Nitrobenzene	58
9. Preparation of <i>m-di</i> -Nitrobenzene	60
10. Preparation of <i>p</i> -Bromoacetanilide.....	62

Alkylation

11. Preparation of Methyl-2-Naphthyl Ether.....	65
12. Preparation of Anisole	67

Benzilic Acid Rearrangement

13. Preparation of Benzilic acid.....	70
---------------------------------------	----

Claisen-Schmidt Condensation

14. Preparation of Benzylidene Acetophenone.....	73
15. Preparation of Benzalacetone	75

Williamson Ether Synthesis

16. Preparation of Phenacetin.....	78
------------------------------------	----

Fischer Indole Synthesis

17. Preparation of 2-Phenylindole	81
---	----

Perkin Reaction

18. Preparation of Cinnamic Acid	85
--	----

Hydantoin Synthesis

19. Preparation of Hydantoin.....	88
-----------------------------------	----

Biltz Synthesis

20. Preparation of Phentytoin	91
-------------------------------------	----

Schiff Bases

21. Preparation of Furanylmethylidene Aminophenol (Solventless Reaction)	94
22. Preparation of Furanylmethylidene Aminophenol (Solvent Reaction)	97

Berthsen Phenothiazine Synthesis

23. Preparation of Phenothiazine.....	99
---------------------------------------	----

Berthsen Acridine Synthesis

24. Preparation of 9-Phenylacridine	101
---	-----

Knoevenagel Condensation

- | | |
|---|-----|
| 25. Preparation of Coumarin..... | 105 |
| 26. Preparation of 5-Arylidenethiazolidine-2,4-dione..... | 108 |

Hantzsch 1,4-Dihydropyridine Synthesis

- | | |
|---|-----|
| 27. Preparation of 1, 4-Dihydropyridine..... | 115 |
| 28. Preparation of N-Aryl-1,4-dihydropyridine by (Solid Phase Reaction) | 117 |
| 29. Preparation of N-Aryl-1,4-dihydropyridine from Schiffbase
(Solid Phase Reaction) | 119 |

Radziszewski Imidazole Synthesis

- | | |
|--|-----|
| 30. Preparation of 2,4,5-Triaryl Imidazole (Solventless Reaction) | 123 |
| 31. Preparation of 2,4,5-Triaryl Imidazole (using glacial acetic acid as a solvent)..... | 125 |
| 32. Preparation of Tetraaryl Imidazole | 127 |
| 33. Preparation of Tetraaryl Imidazole via Schiff base (Solventless Reaction) | 129 |
| 34. Preparation of Tetraaryl Imidazole via Schiff base (Solvent Reaction)..... | 131 |

Mannich Reaction

- | | |
|--------------------------------------|-----|
| 35. Preparation of Mannich Base..... | 134 |
|--------------------------------------|-----|

Philips Reaction

- | | |
|--|-----|
| 36. Preparation of Benzimidazole..... | 137 |
| 37. Preparation of 2-Phenylbenzimidazole..... | 139 |
| 38. Preparation of Benzimidazol-2-one | 141 |
| 39. Preparation of Benzimidazolesulphonic Acid | 143 |

Amide Synthesis

- | | |
|---|-----|
| 40. Preparation of N-Butylbenzamide | 147 |
| 41. Preparation of Phthalimide | 149 |

Haloform Reaction

- | | |
|-----------------------------------|-----|
| 42. Preparation of Iodoform | 151 |
|-----------------------------------|-----|

Paal-Knorr Pyrazole Synthesis

- | | |
|---|-----|
| 43. Preparation of 3-Methyl-1-phenyl pyrazole-5-one | 154 |
|---|-----|

Nucleophilic Addition

- | | |
|--|-----|
| 44. Preparation of Chlorobutanol | 157 |
|--|-----|

Oxidation

45. Preparation of Benzil	160
46. Preparation of 2-Nitrobenzoic Acid.....	164
47. Preparation of Benzoic Acid.....	166

Hydrolysis

48. Preparation of Benzoic Acid.....	169
49. Preparation of Benzoic Acid from Phenyl Benzoate	172

PART - 3 QUALITATIVE ANALYSIS

50. Qualitative Analysis of Carbohydrates	177
51. Preparation of Derivatives of Organic Compounds.....	180
52. Degradation of Atropine	185
53. Degradation of Trimyristin	188

PART - 4 QUANTITATIVE ANALYSIS

54. Determination of Saponification Value	193
55. Determination of Loss On Drying	197
56. Estimation of Amides	199
57. Estimation of Esters	202
58. Estimation of Carbonyl Compounds	205
59. Assay of Riboflavin	207
60. Estimation of Aspirin.....	210
61. Estimation of Aspirin in Aspirin-Caffeine Tablets	212

PART - 5 NATURAL COMPONENT ISOLATION

62. Isolation of Red dye from <i>Caesaipinea sappan</i>	217
63. Isolation of Mucilage from Plants	219
64. Isolation of Pectins from Plants	222
65. Isolation of Phenolic Compounds from Grape Seed	225
66. Isolation of Piperine from Pepper.....	228
67. Isolation of Caffeine from Tea	230