

CONTENTS

Introduction	1
1 Separations of Organic Compounds	10
2 Recrystallization and Melting Point Ranges	24
3 Separation Techniques: Isolation of Trimyristin from Nutmeg	41
4 The Preparation and Purification of Myristic Acid	51
5 Steam Distillation: Isolation of Limonene	61
6 Fractional Distillation: Purification of Limonene	71
7 Observing Chemical Reactions: Solubility Tests, Chemical Characterization Tests, and Thin Layer Chromatography	81
8 Substitution Reactions of Organic Compounds: Preparation of 3-Methyl 1-2-Pentene	95
9 Elimination Reactions of Organic Compounds: Preparation of 3-Methyl-2-Pentene	100
10 Product Analysis: Gas-Liquid Partition Chromatography	108
11 Addition Reactions of Organic Compounds: Preparation of 3-Bromo-3-Methylpentane	127
12 Infrared Spectroscopy	133
13 Structural Identification of Organic Compounds	156
14 Oxidation Reactions of Organic Compounds: Oxidation of Alcohols	169
15 The Grignard Synthesis: Preparation of 1,2-Diphenylethanol	185
16 Dehydration of 1,2-Diphenylethanol	192
17 Friedel-Crafts Reactions: Preparations of 1,3-Dimethyl-5-tert-Butylbenzene and 2,4-Dimethylacetophenone	197
18 Nuclear Magnetic Resonance Spectroscopy	208
19 Column Chromatography: Synthesis and Purification of o-Nitrophenol	229
20 Diazotization of 2,5-Dichloroaniline: Preparation of 2,5-Dichlorophenol	239
21 Identification of Organic Compounds Containing Carbon, Hydrogen, and Halogen	251
22 Identification of Organic Compounds Containing Carbon, Hydrogen, and Oxygen	259
23 Identification of Organic Compounds Containing Carbon, Hydrogen, and Nitrogen	271
24 Identification of Carboxylic Acids and Carboxylic Acid Derivatives	283
25 Identification of a General Unknown	298
26 Separation and Identification of the Components of a Mixture	305
27 Phase Transfer Catalysis in the Synthesis of 7,7-Dichlorobicyclo[4.1.0]heptane	311
28 Multistep Organic Synthesis: Preparation of Benzocaine	317
29 Condensation Reactions: Synthesis of Coumarin-3-Carboxylic Acid	324
30 Electronic Absorption Spectroscopy	331
31 Use of Protective Groups in Organic Synthesis: Preparation of 4,4-Diphenyl-3-buten-2-one	347
32 Stereoselectivity in Reductions of 3-Methylcyclohexanone	357
33 The Association of Caric Ion with Benzyl Alcohol: The Equilibrium Expression and Equilibrium	

Constant	363
34 Ceric Ion Oxidation of Benzyl Alcohol: The Rate Law and Rate Constant	370
35 An Enzyme-Catalyzed Reaction: hydrolysis of Urea	376
36 Polarimetry: Hydroboration-Oxidation of (+)- α -pinene	382
37 Diels-Alder Reactions: Synthesis of cis-4-Methy-4-cyclohexene 1,2-dicarboxylic Acid Anhydride	391
38 Polymers and Polymerization	397
39 Multistep Organic Syntheses: Formation and Reactions of Diethyl α -Acetoglutarate	408
40 Use of the Chemical Literature for Organic Syntheses	417
Appendix A Tables of Selected Organic Compounds with Their Physical Constants and Derivatives	428
Appendix B Characteristic Infrared Absorptions for Organic Compounds	468
Appendix C Characteristic Proton NMR Spectral Positions for Organic Compounds	472
Useful References	474
Index	479