

CONTENTS

	Page
I. Introduction.....	1
II. The Evolution of Lignin Chemistry.....	3
III. The Definition and Distribution of Lignin.....	7
IV. Color Reactions of Lignified Materials.....	33
A. Introduction.....	33
B. Color Reactions with Aliphatic Compounds.....	33
C. Color Reactions with Phenolic Compounds.....	36
D. Color Reactions with Aromatic Amines.....	45
E. Color Reactions with Heterocyclic Compounds.....	46
F. Color Reactions with Inorganic Reagents.....	51
G. Color Reactions with Dyestuffs.....	59
V. The Isolation of Lignin.....	62
A. Preparation of the Plant Material.....	62
B. Native Lignins.....	62
C. Insoluble Lignins.....	83
D. Organosolv Lignins.....	87
E. Lignins Extracted with Inorganic Reagents.....	94
F. Lignin Isolated by Hydrotropic Solvents.....	104
G. Lignin Isolated by a Mild Hydrogenation.....	113
H. Lignins Isolated from Barks.....	115
VI. The Determination of Lignin.....	127
A. Introduction.....	127
B. Direct Methods.....	128
C. Indirect Methods.....	147
D. Determination of Lignin in Spent Sulfite Liquor.....	154
E. Comparison of Lignin Determination Methods.....	156
F. Some Reported Lignin Contents.....	157
VII. The Physical Properties of Lignin.....	173
A. Introduction.....	173
B. Solubility.....	173
C. Melting Point.....	177
D. Heat of Combustion.....	177
E. Color.....	178

	Page
XV. The Alcoholysis of Lignin	440
A. Introduction.....	440
B. Alcohol Lignins.....	441
C. Polyalcohol Lignins.....	458
D. Alcoholysis to Monomolecular Lignin Building Stones.....	459
E. Theories on the Formation of Alcohol Lignin.....	465
XVI. The Mercaptolysis of Lignin	469
A. Introduction.....	469
B. Protolignin.....	470
C. Isolated Lignins.....	472
D. Reactions with Model Compounds.....	474
E. Conclusions.....	476
XVII. The Phenolysis of Lignin	477
XVIII. Reduction, Hydrogenation, and Hydrogenolysis of Lignin	486
XIX. The Oxidation of Lignin	498
A. Introduction.....	498
B. Oxidation in a Neutral Solution.....	500
C. In an Acid Medium.....	507
D. In an Alkaline Medium.....	513
XX. The Alkali Fusion of Lignin	551
XXI. Special Reactions with Lignin	552
A. The Condensation of Lignin with Halofatty Acids.....	552
B. The Condensation of Lignin with Maleic and Succinic Anhydride.....	552
C. The Condensation of Lignin with Methylene Iodide.....	553
D. The Condensation of Lignin with Acetylene.....	553
E. The Condensation of Lignin with Formaldehyde.....	553
F. The Condensation of Lignin with Dimethylamine, or Piperidine, and Formaldehyde.....	555
G. The Condensation of Lignin with Hexamethylenetetramine..	556
H. The Condensation of Lignin with Thiourea.....	557
I. An Attempted Kolbe-Schmidt Reaction with Protolignin....	557
J. The Action of Sodium in Liquid Ammonia on Lignin.....	558
K. The Effect of Irradiation on Lignin.....	563
L. The Effect of Gamma Radiation on Lignin.....	564
XXII. The Thermal Decomposition of Lignin	567
XXIII. The Biological Decomposition of Lignin	577
A. Decomposition by Digestive Microorganisms (Metabolism of Lignin).....	577
B. Decomposition by Soil Microorganisms.....	584
C. Decomposition by Wood-Destroying Fungi.....	589

	Page
XXIV. Theories on the Structure of Lignin.....	616
XXV. The Linkage of Lignin in the Plant BY J. W. T. MEREWETHER....	630
XXVI. The Biosynthesis of Lignin.....	659
A. Introduction.....	659
B. The Lignification Process.....	681
C. The Biosynthesis of Lignin Building Stones.....	689
D. The Biosynthesis of Ligninlike Products.....	727
E. Conclusions.....	737
XXVII. Synthetic Lignins.....	739
Appendix.....	742
A. Methods.....	745
B. Commercial Lignins.....	753
C. The Utilization of Lignin.....	773
Author Index.....	
Subject Index.....	