Phenolic resins are obtained by the reaction of phenols with aldehydes. The simplest representative of these types of compounds, phenol and formaldehyde, are by far most important. Phenolic resins are mainly used in the production of circuit boards. The development of synthetic resins for surface coating applications has usually followed the use of similar material in the plastic industry. One of the first synthetic resins ever used commercially, both in plastics and in surface coatings was the phenolic resin. Phenolic resins result aldehyde with or without modification. Phenol resin bonded wood materials; particle boards (PB), plywood, fiber board (FB) and glued wood construction element are used for outdoor construction and in high humidity areas because of the high water and weathering resistance of the phenolic adhesive bond and high specific strength. The competitiveness and development of the wood working industry are of utmost importance for the development for thermosetting plastics. This industry is the largest consumer of urea melamine and phenol resins. Phenolic laminates are made by impregnating one or more layers of a base material such as paper, fiberglass or cotton with phenolic resin and laminating the resin saturated base material under heat and pressure. The resin fully polymerizes (cures) during this process. The base material choice depends on the intended application of the finished product. Paper phenolics are used in manufacturing electrical components such as punch through boards and household laminates. Glass phenolics are particularly well suited for use in the high speed bearing market. Other applications of phenolic resins are in chemical equipments, fibers, socket putties, photo resists, tannins, brush putties, etc. Good performance at a reasonable cost has long been an important selling point for phenolic resins, especially in applications such as wood bonding and insulation, where discoloring and other drawbacks can be overlooked because of cost savings. Hence demand of phenolic resins is growing rapidly. This book basically deals with general reaction of phenols with aldehydes, the resoles, curing stages of resoles, kinetics of a stage reaction, chemistry of curing reactions, kinetics of the curing reaction, the novolacs, decomposition products of resites, acid cured resites, composition of technical resites, mechanisms of rubber vulcanization with phenolic resins, thermosetting alloy adhesives, vinyl phenolic structural adhesives, nitrile phenolic structural adhesives, phenolic resins in contact adhesives, chloroprene phenolic contact adhesives, nitrile phenolic contact adhesives, phenolic resins in pressure sensitive adhesives, rubber reinforcing resins, resorcinol formaldehyde latex systems etc. The present book covers manufacturing processes of phenolic resins. New entrepreneurs, technocrats, research scholars can get good knowledge from this book.
14. MECHANICAL PROPERTIES OF LAMINATED PHENOLIC RESINS

Introduction, Mechanical Properties at Ordinary Temperatures, Tensile Strength, Modulus of Elasticity, Compressive Strength, Flexural Strength, Shear Strength, Bearing Strength, Impact Resistance, Creep and Stress Endurance, Fatigue Resistance, Influence of Temperature on Mechanical Properties, Influence of Temperature on Creep, Theoretical Discussion of Strength Properties of Phenoplasts, Strength-Weight Comparisons with Metals

15. MODIFIED AND THERMAL-RESISTANT RESINS

Etherification Reactions, Esterification Reaction, Boron-Modified Resins, Silicon-Modified Resins, Phosphorus-Modified Resins, Heavy Metal-Modified Resins, Nitrogen-Modified Resins, Sulfur-Modified Resins

16. COMPOSITE WOOD MATERIALS


17. MOULDING COMPOUNDS

Standardization and Minimum Properties, Composition of Molding Powders, Resins, Fillers, Reinforcements and Additives, Wood Flour and Cellulose Fibers, Asbestos, Mineral Flour, Other Fillers and Fibers, Colorants, Lubricants and Release Agents, Production of Molding Powders, Thermoset Flow, Manufacturing of Molded Parts, Compression Molding, Transfer Molding, Injection Molding, Selected Properties, Thermal Resistance, Shrinkage and Post-Mold Shrinkage, Thermal Expansion

18. HEAT AND SOUND INSULATION MATERIALS


19. THERMAL PROPERTIES OF PHENOLIC RESINS

Introduction, Coefficient of Expansion, Flame Resistance

20. CHEMICAL RESISTANCE OF PHENOLIC RESINS

Introduction, Water Absorption, Effect of Reagents, Chemical Applications for Phenoplasts, Resistance to Microorganisms

21. OIL SOLUBLE PHENOLIC RESINS

Introduction, Pure Oil-Soluble Phenoplasts, The Modified Phenoplasts, Reactions of the Phenoplasts with Oils

22. FRICTION MATERIALS


23. PHENOLIC RESINS IN RUBBERS AND ADHESIVES

24. PHENOLIC ANTIOXIDANTS

25. OTHER APPLICATIONS
Carbon and Graphite Materials, Phenolics for Chemical Equipment, Phenolic Resin/Fiber Composites, Phenolic Resin Fibers, Blast Furnace Taphole Mixes, Photo-Resists, Socket Putties, Brush Putties, Tannins, Ion-Exchange-Resins, Casting Resins

26. TECHNICAL MANUFACTURE OF PHENOLIC RESINS
Resin Manufacture, Cast Resins, Resin Varnishes, Resin Compound, Molding Powder, Phenoplast Molding Laminates

27. MOULDING TECHNIQUE FOR PHENOLIC RESINS
Introduction, Compression Molding, Transfer Molding, Injection Molding, Molding Practice, Preheating

28. MISCELLANEOUS TECHNICAL APPLICATIONS OF PHENOLIC RESINS

29. FOUNDRY RESINS

30. INDUSTRIAL LAMINATES AND PAPER IMPREGNATION
Electrical Laminates, Materials, Paper, Resins, Production of Electrical Laminates, Laminated Tubes and Rods, Cotton Fabric Reinforced Laminates, Decorative Laminates, Filters, Battery Separators

31. COATINGS
Automotive Coatings, Water-Borne Paints and Electrodeposition, Coatings for Metal Containers, Marine Paints, Shop Primers, Wash Primers, Oil-Modified Phenolic Resin Paints, Printing Inks, Rosin-Modified Phenolic Resins, Other Applications

32. ABRASIVE MATERIALS

33. ELECTRICAL PROPERTIES OF PHENOLIC RESINS

34. ANALYTICAL METHODS
Monomers, Nitrogen and Water, Physical Properties, Reactivity, Chromatographic Methods, Spectroscopy

35. PHENOLIC RESINS AS ION-EXCHANGE RESINS
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