



Handbook of thermoset plastics /

Dodiuk, Hanna,
editor

Monografía

<https://rebiunoda.pro.baratznet.cloud:28443/OpacDiscovery/public/catalog/detail/b2FpOmNlbGVicmF0aW9uOmVzLmJhcmF0ei5yZW4vMzQ2MDAyOTA>

Título: Handbook of thermoset plastics edited by Hanna Dodiuk

Edición: 4th ed

Editorial: Kidlington, Oxford Cambridge, Massachusetts William Andrew [2022] 2022

Descripción física: 1 online resource (1118 pages)

Mención de serie: Plastics Design Library

Bibliografía: Includes bibliographical references and index

Contenido: Front Cover -- Handbook of Thermoset Plastics -- Copyright Page -- Dedication -- Contents -- List of contributors -- Biography -- Preface -- Acknowledgments -- Tribute from the Publisher and the Editor -- 1 Introduction -- History -- Definitions -- Cross-linking -- Influence of time, temperature, and mass -- Shelf life and pot life -- Curing -- Staging -- Cross-link density -- Measuring cross-link density -- Stoichiometric considerations -- Prepolymerization and adducting -- Dual curing of thermosets -- Reversible covalent bonding -- References -- 2 Phenol-formaldehyde resins -- Introduction -- Phenolic resins -- Raw materials -- Phenol -- Cumene process for making phenol -- Raschig process -- Dow process -- Formaldehyde (CH₂O) -- Hexamethylene tetramine (Hexamine or "HEXA") (CH₂)₆N₄ -- Resinification (production) of phenol-formaldehyde resins -- Reaction chemistry -- Polymerization process -- Resole phenolic resins -- Resinification reaction of resole-type phenol-formaldehyde resin -- Novolac phenol-formaldehyde resins -- Resinification reaction of novolac-type phenol-formaldehyde resin -- Differences between resole and novolac phenolic resins -- Metallic ion catalysis and reaction orientation -- Alkaline acceleration of curing -- Properties of phenolic resins -- Fillers for phenolic resins -- Processing methods for phenolic resins -- Applications of phenolic resins -- Phenolic resins in plywood -- Other composite wood products -- Particleboard -- Waferboard -- Fiberboard -- Strandboard -- Reactivity and hardening reactions of phenol-formaldehyde wood adhesive resins -- Prediction of properties -- Phenolic resins in adhesive and bonding applications -- Phenolic resins as insulation materials -- Phenolic resins in friction materials -- Bonded and coated abrasives -- Phenolic resins in foundry and shell molding applications Shell molding process -- Cold box process -- Trends in foundry and shell molding -- Phenolic resins in laminating applications -- Phenolic resins in molding applications -- Phenolic resins in coating applications -- Modification of phenolic resins -- Postaddition of urea -- Cocondensation between phenol and urea -- Addition of tannins, lignin, and isocyanates -- Resorcinol adhesives -- Chemistry of resorcinol formaldehyde resins -- Phenol-resorcinol-formaldehyde adhesives -- Special adhesives of reduced resorcinol content -- Thermosetting phenolic adhesives based on natural resources --

References -- Further reading -- 3 Polybenzoxazines: recent advances -- Introduction -- H-bonding in polybenzoxazines -- Polybenzoxazines derived from functional monomers -- Bioorigin-based polybenzoxazines -- Nanocomposites of polybenzoxazine -- Unconventional properties of polybenzoxazines -- Smart properties of polybenzoxazines -- Other applications -- Summary -- References -- 4 Aminoresins -- Introduction -- Raw materials -- Urea -- Melamine -- Chemistry of urea-formaldehyde resins: urea-formaldehyde condensation -- Chemistry of melamine-formaldehyde resins: melamine-formaldehyde condensation -- Mixed melamine resins -- Biobased urea and melamine resins -- General principles of manufacture and application -- Urons and uron resins -- Adhesive and bonding resins -- Coating resins -- Laminating resins -- Amino molding resins -- Applications of aminoresins -- Adhesive and bonding -- Coatings -- Protective coatings -- Textile treatment and coating -- Paper treatment and coating -- Laminating -- Molding -- Miscellaneous -- References -- 5 Furan resins -- Introduction -- Resins from furfuryl alcohol and furfural -- Photocross-linkable furan polyesters -- Furan polyurethane foams -- Photoresists from pending furan chromophores -- Ion-exchange resins based on 2-vinylfuran Epoxy resins -- Networks based on Diels-Alder polycondensations -- References -- 6 Unsaturated polyesters and vinyl esters -- Unsaturated polyesters -- General Remarks and history -- Chemistry -- General aspects -- Manufacturing of the unsaturated polyester backbone -- Cross-linking the unsaturated polyester chains by copolymerization with comonomers -- Processing equipment and manufacturing -- Sustainable UPR production -- Process intensification by reactive distillation -- Biobased unsaturated polyesters and composites -- General aspects -- Unsaturated polyester resin composites with biobased fillers -- Unsaturated polyester resin materials derived from biobased starting materials -- Properties of unsaturated polyester resins -- Properties of neat unsaturated polyester resin prepolymer -- Properties of styrenated unsaturated polyester resin liquid -- Properties of cured unsaturated polyester materials -- Rigid general purpose resins -- Flexible unsaturated polyester resins -- Unsaturated polyester resins of increased hydrolytical stability and chemical resistance -- Vinyl ester resins -- General remarks -- Chemistry -- Properties of vinyl ester resins -- Special vinyl ester resins -- Compounding of unsaturated polyester and vinyl ester resins -- Overview -- Curing systems -- Metal soap/ketone peroxide-based catalysts -- Aromatic tertiary amine/benzoyl peroxide-based catalysts -- Commercial prepromoted resins -- Heat-curing systems -- Handling catalysts and promoters -- Inhibitors -- Additives -- Ultraviolet absorbers -- Thixotropic/flow control agents -- Thickening agents -- Fillers -- Function of fillers -- Mixing and compounding of fillers -- Typical fillers used in unsaturated polyester resin -- Fiber reinforcements -- Property modification of unsaturated polyesters Performance improvement of unsaturated polyester resin by design of unsaturated polyester resin nanocomposites -- Nanoclays as fillers for unsaturated polyester resin and vinyl ester resins -- Carbon nanotubes, carbon nanofibers, and other nanofibrous fillers -- Other nanoparticles -- Flame retardance -- Inorganic and organic additive combinations with flame-retardant properties -- Structural modification: incorporation of flame-retardant functional groups into the unsaturated polyester resins backbone -- Application of nanofillers for flame retardance -- Incorporation of flame-retardant into reinforcing structure -- Shrinkage behavior -- Incorporation of antishrink units directly into the unsaturated polyester resins network -- Use of unsaturated polyester resins as antishrink additives -- Manufacturing processes for unsaturated ester and vinyl ester composites -- Overview -- Workplace safety -- Hand layup -- Spray layup -- Resin infusion and related processes -- Resin-transfer molding -- Structural reaction injection molding -- Sheet and bulk molding compounds -- Other molding processes for unsaturated polyester and vinyl ester resins -- Pultrusion -- Winding, braiding, and centrifugal casting -- Other processes and applications of unsaturated polyester and vinyl ester resins -- Water extended polyester -- Casted giftware and art objects -- Cultured marble and onyx -- Monolithic flooring -- Polymer concretes -- Recent developments -- Smart materials: unsaturated polyester resins with shape memory effect -- Application of unsaturated polyester resins in optics, electronics, and energy conversion -- Use of unsaturated polyester resins in luminescent solar concentrators -- Use of doped unsaturated polyester resins as polymeric capacitors in printed circuit boards -- Use as embedding matrix for magnetostrictive materials Foamed unsaturated polyester resins -- Ultrafine unsaturated polyester resins fibers -- Medical applications: unsaturated polyesters for biomedicine and tissue engineering -- Other applications of unsaturated polyesters -- References -- 7 Allyls -- Introduction -- Polydiallyldiglycolcarbonate (CR-39) -- General aspects -- Chemistry -- Polymerization and processing -- Formulation -- Properties -- Applications -- Trade names -- Polydiallylphtalates -- General aspects -- Chemistry -- Polymerization and processing -- Formulation -- Properties -- Applications -- Trade names -- References -- 8 Epoxies -- Introduction -- History -- Basic chemistry and some general remarks -- Detailed chemistry -- Resin types -- Diglycidyl ether of bisphenol A -- Diglycidyl ether of bisphenol F -- Novolacs -- Peracid resins -- Hydantoin resins -- Other types -- Curing process, curatives, and cross-linking reactions -- Stoichiometry -- Curing agents -- Alkaline curing agents -- Primary and secondary aliphatic amines -- Modified

amines -- Aromatic amines -- Cycloaliphatic amines -- Ether amines -- Amidoamines -- Polyamides -- Imidazoles -- Tertiary amines -- Other amines -- Acid-curing agents -- Lewis acids -- Phenols -- Organic acids -- Cyclic anhydrides -- Polysulfides and mercaptans -- Formulation principles -- Epoxy-containing reactive diluents -- Resinous modifiers -- Nonreactive diluents -- Fillers -- Colorants and dyes -- Rheological additives -- Other additives -- Characterization of epoxies -- Gibbs function of reaction -- Molecular weight, segment mobility, cross-link density, and glass transition -- Differential scanning calorimetry for glass transition region location -- Temperature-modulated differential scanning calorimetry -- Thermomechanical analysis -- Dynamic mechanical analysis -- Thermally stimulated depolarization -- Chemoviscosity -- Gelation Vitrification

ISBN: 0-323-89994-3

Materia: Thermosetting plastics Biopolymers Adhesives

Autores: Dodiuk, Hanna, editor

Enlace a formato físico adicional: 0-12-821632-8

Punto acceso adicional serie-Título: Plastics Design Library

Baratz Innovación Documental

- Gran Vía, 59 28013 Madrid
- (+34) 91 456 03 60
- informa@baratz.es