

# Curriculum Vitae



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## **DUANE B. PRIDDY, Ph.D.**

### **SYNOPSIS**

Dr. Duane B. Priddy joined Dow Chemical in 1966 as a Research Chemist. In 1972, Dr. Priddy joined the Plastics division of Dow. Dr. Priddy is a renowned Plastics Scientist and author as evidenced by his television appearance (see <http://bit.ly/60minutes-priddy>) and requests to be Keynote speaker at international conferences. In 2001 he was awarded “Fellow” by the Polymeric Materials Division of the American Chemical Society. In 2008 he was awarded “Fellow” by the Society of Plastics Engineers for his pioneering work in the development of Plastic Science & Technology. He is a member of ASM International (a society of Material Scientists), the American Chemical Society Polymer Chemistry and Polymeric Materials Divisions, the International Association of Plumbing and Mechanical Officials, the Failure Analysis Division of the Society of Plastics Engineers, and the Society of Automotive Engineers. Dr. Priddy is a leading expert in all types of polymeric materials and manufacturing processes of plastics and the design of plastic parts for manufacture including injection molding, foam products, blow molding, extrusion, and thermoforming. He has been involved in failure analysis of hundreds of plastic and composite parts including plumbing parts, bottles, tanks, latches, toys, medical devices, exercise equipment, automotive parts, pulleys, chairs, plastic food packages, plastic films, and stools. Dr. Priddy is an expert in plastic part design and has published papers on the failure of plastic parts resulting from design defects. He is also an expert in all aspects of UV, thermal, and thermal-oxidative degradation of polymeric materials. Dr. Priddy is especially well-known for his expertise in failures of plastic piping including CPVC, PEX, PP, and PVC. Dr. Priddy has served as an expert in over 200 litigations and has authored >100 scientific papers, >60 US Patents, a book entitled “Modern Styrenic Plastics”, and several encyclopedia articles on chemicals and plastics.

### **CONSULTANT AND EXPERT WITNESS ON CHEMICALS AND PLASTICS**

- Root cause analysis of plastic and rubber component parts and devices
- Remediation of failing plastic piping systems
- Plastic piping products including ABS, HDPE, PVC, CPVC, PE, PEX, PP, PVDC
- Chemical compatibility testing of plastics
- Additives for plastics including antioxidants and UV stabilizers

- Foams including EPS, STYROFOAM, and PU foam
- Chemical processes for manufacture of specialty monomers and polymers
- Exercise equipment failure including burst resistant exercise balls
- Design of plastic parts to meet the requirements of the application
- Fracture mechanics of plastic materials and composites
- Chemical resistance/degradation of plastics and elastomers
- Plastic part and package design and stress analysis
- Polymer blends and compounding
- Polyolefin based resins and applications
- Adhesives and coatings failure
- Weathering of transparent plastics including acrylic, polycarbonate, and polyesters
- Monomer stabilization and polymerization
- Molding and extrusion of plastics including foams and films
- UV, thermal, and environmental degradation of chemicals and plastics
- Styrenic polymers including HIPS, GPPS, SAN, ABS, and SMA
- Migration of chemicals and additives from plastics
- Material Selection (choosing the right plastic for the application)
- Computer analysis of plastic part design - Finite Element Analysis

#### **EDUCATION**

- Ph.D. Organic Chemistry - 1971 - Michigan State University
- BA Chemistry - 1966 - Olivet College, Olivet, MI

#### **MAIN ACCOMPLISHMENTS**

- > 60 Issued United States Patents
- >100 Publications including 5 encyclopedia articles and 8 book chapters
- Author/Editor of book "Modern Styrenic Polymers" Wiley 2003

#### **WORK EXPERIENCE**

- Dow Chemical Company 1966 – 1968
- Dow Plastics 1972 - 2001
- CEO of Plastic Expert Group and Failure Labs - 2004 to present

#### **ACADEMIC**

- Adjunct Professor at Michigan Technological University – 1988 - 1995
- Adjunct Professor at Central Michigan University – 1988 to present

#### **HONORS & AWARDS**

- Awarded "Fellow" of the Society of Plastics Engineers (SPE) 2008
- Awarded "Lifetime Achievement Award" by Dow Plastics – 2001
- Awarded "Fellow" National American Chemical Society (ACS) PMSE – 2001

## Litigation Experience Last 5 years

Matter	Description	Plntf	Dfn	Service	Year
Nuwer et al v FCA	Chrysler AHR MDL	X		C/EO	2022
Pierce v C - L	Skylight failure	X		C	2022
Nuwer et al v FCA Chrysler Group	Automotive part failure	X		C/EO/D	2022
Statler v Aquatherm	PP pipe failure	X		C	2022
Dipasquale v MSC International	Injury caused by plastic part failure	X		C	2022
Landis v Franklin, New Orleans	CPVC pipe failure	X		C/EO	2021
Meller v I. Grace, Los Angeles	CPVC pipe failure		X	C	2021
MDL Plaintiffs v Uponor, CA & CO	Defective PEX pipe	X		C	2021
Chubb Ins v Baker Manufacturing	Subro/filter leak/property damage	X		C/EO	2021
Rishavy v Home Depot & Adams, FL	Plastic Chair Failure	X		C	2021
Bloom v Legend Corp, Australia	Nylon zip-tie failure causes injury	X		C	2021
Savoy v ABCO, OH	CPVC fire sprinkler pipe failure	X		C/EO/D	2021
Donegal v Pentair	Water filter cannister failure		X	C	2020
Univ. NM v Charlotte Pipe	CPVC ChemDrain pipe failure	X		C	2020
Allstate v Aquion/Fabric	Water filter cannister failure		X	C	2020
Saenz v Lane Aire	Defective skylight design	X		C	2020
LeCosta v Atrium Medical	Defective design of medical implant		X	EO	2020
Rowan Reid v Toastmaster	Defective part design	X		EO	2020
Romero v Uponor	PEX tubing failure	X		EO	2020
225 Beronne St v Roy Anderson	CPVC pipe failure		X	C	2020
MDL v Mercedes Benz	Injuries caused by defective part design	X		C	2020
Connie Englund v Paradise LLC et al.	Personal Injury / Bath Mat		X	EO	2020
Feldstein v Mr. Water Heater et al	Plastic tank failure	X		EO	2019
David Cowell v Theraband	Personal Injury / Exercise Ball Failure	X		C	2019
Amerisure Ins. V International Fire	CPVC Fire Sprinkler Pipe Failure		X	C	2019
Pham v Kubota	Safety shield failure		X	C	2019
State Farm v Aquion/Fabrik	Water filter cannister failure		X	C	2019
AAA v Aquion/Fabrik	Water filter cannister failure		X	C	2019
SVRJ v Texas Sterling	PVC pipe failure		X	C	2019
Artisan v Jasper Plastics et al	PU garage door warpage	X		C	2019
Africano v Atrium Medical	Defective design of medical implant	X		EO/D	2019
Downie v Atrium Medical	Defective design of medical implant	X		C	2019
ASB Real Estate v Viking	CPVC fire sprinkler pipe failure	X		C	2019
LeMoine v Hilti/Spears	CPVC fire sprinkler pipe failure	X		EO	2018
Hitt v Ethicon	Defective design of medical implant	X		EO/D	2018
Crystal Springs HOA v Old Faithful	CPVC fire sprinkler pipe failure	X		EO/D	2018
FM v Absolute Board Co	Defective skateboard design	X		EO	2018
Garsen v Hardgoods	Plastic bottle failure		X	C	2018
Hotel Durham v Hilti	CPVC incompatible caulk	X		C	2018
Feldman v BRP	Part Design Defect	X		C	2018
Statler v Spears	CPVC incompatible caulk	X		C/EO	2018
State Farm v Fabrik	Part Design Defect		X	C	2018
Gerner v Ceccerilli	PE tubing failure		X	C/EO/D	2018
Federal Insurance v TOTO	Toilet Bracket Failure	X		C	2018
JB Weld v Gorilla Glue	Adhesive strength tests and analysis		X	EO	2018
Sanders v CalAtlantic	PEX pipe failure	X		C/EO	2018
Jones v Riccio	Skylight failure		X	C/D	2017
Federal Ins. V Subzero	PEX tubing failure		X	C	2017
Dwight Hartley v Rubbermaid	Plastic chair failure		X	C	2017
Grinder v Drive Medical	Plastic wheel failure	X		C/EO	2017
Rodoni v Regal Outdoor Products	Deck PVC guard rail failure	X		C/EO	2017
AMS MDL 2325	Defective design of medical implant	X		EO	2017
Lawson v Manta	Medical malpractice	X		EO/D	2017
BAB investments v Cunningham Waters	Plumbing part failure	X		C/EO/D	2017
Packaging Personified v Ice King	PE bag odor	X		C/EO/D	2017
Tyrone O'Neal v GKN Aerospace	Acid exposure / Plastic valve fracture	X		C/EO	2017

Key: C = Consultant / EO = expert opinion / D = deposition / CT = courtroom testimony

## Scientific Articles and Publications

Duane Priddy, **Causes of Failure & Remediation Options for Failing CPVC Fire Sprinkler Piping Systems**; Presented June 5<sup>th</sup> 2017, National Fire Protection Association Technical Conference, Boston June 4 – 7, 2017

Duane Priddy, Rowland Hall, Dan Beaudoin, **Selecting the Best Remediation Option for Failing CPVC Piping Systems**, Society of Plastic Engineers/Plastic Pipe Division, 2016 ANTEC Proceedings, pp. 1445 – 8.

Duane Priddy, **Why do PVC & CPVC pipes occasionally fail?** Popular Plastics & Packaging (2015), 60(8), 29-37.

Duane Priddy, **Styrene Polymers**, Encyclopedia of Polymer Science and Technology (4th Edition) (2014), 13, 179-268.

Duane Priddy, **Forensic Analysis of CPVC Fire Sprinkler Piping**, Subrogator, Spring/Summer 2012, pp. 72 – 77.

Duane Priddy, **When CPVC Pipes and Fittings Fail in Hydronic Heating/Cooling Systems**, Plastics Engineering, April 2012, pp. 4 – 9.

Duane Priddy, **Root Cause of Occasional Failure of CPVC Pipes Used in Hydronic Heating/Cooling Systems**, Society of Plastics Engineers Annual Technical Conference Proceedings 2011, pp. 1404-9.

Saczalski, Ken, West, Mark, and Duane Priddy, **Damage Analysis Technique for Evaluation of Plastic Seats in Handicapped Mobility Devices**, Proceedings of the SAMPE Tech 2011 Conference, Session on Design, Analysis, and Simulation II, Fort Worth, Texas October 17-20. Obtain a copy of this paper at [https://www.researchgate.net/publication/289395658\\_Damage\\_analysis\\_technique\\_for\\_evaluation\\_of\\_plastic\\_seats\\_in\\_handicapped\\_mobility\\_devices](https://www.researchgate.net/publication/289395658_Damage_analysis_technique_for_evaluation_of_plastic_seats_in_handicapped_mobility_devices) .

Duane Priddy, **Understanding the Science Behind Burst Resistant Exercise Balls and Why Some Burst During Use**, Material Science & Technology, Columbus Ohio, 2015.

Duane Priddy and Tom Peeler, **Root Cause of Failure of an EPS Foam Coffee Cup**, Society of Plastic Engineers ANTEC 2014, Paper# 1838094. A copy of this paper is available for download at: [https://www.academia.edu/6917812/CASE\\_STUDY\\_THE\\_ROOT\\_CAUSE\\_OF\\_FAILURE\\_OF\\_AN\\_EPS\\_FOAM\\_COFFEE\\_CUP](https://www.academia.edu/6917812/CASE_STUDY_THE_ROOT_CAUSE_OF_FAILURE_OF_AN_EPS_FOAM_COFFEE_CUP)

Duane Priddy, **Styrene plastics**. Kirk-Othmer Encyclopedia of Chemical Technology (5th Edition) (2007), 23, 358-416.

Howell, B. A.; Powers, J. J.; Duane Priddy, **Thermal decomposition of cycloadducts of vinylnaphthalenes with electron-deficient dienophiles.** Center for Applications in Polymer Science, Central Michigan University, Mt. Pleasant, MI, USA. *Journal of Thermal Analysis and Calorimetry* (2006), 85(1), 141-143

Howell, B. A.; Cui, Y.; Duane Priddy, **Determination of residual levels of unsaturation in partially hydrogenated poly(2,3-diphenyl-1,3-butadiene) using thermogravimetry.** *Journal of Thermal Analysis and Calorimetry* (2004), 76(1), 313-322.

Kim, Yongsin; Duane Priddy; Harwood, H. James. **Polymerization and copolymerization of dimethyl(1-ethoxycarbonyl)vinyl phosphate.** *Polymer* (2003), 44(15), 4165-4170.

Li, Irene Q.; Knauss, Daniel M.; Duane Priddy.; Howell, Bob A. **Synthesis and reactivity of functionalized alkoxyamine initiators for nitroxide-mediated radical polymerization of styrene.** *Polymer International* (2003), 52(5), 805-812.

Howell, Bob A.; Cui, Yumin; Duane Priddy, **Determination of residual levels of unsaturation in partially hydrogenated poly(2,3-diphenyl-1,3-butadiene) using thermogravimetry.** *Thermochimica Acta* (2003), 396(1-2), 191-198.

Howell, Bob A.; Cui, Yumin; Duane Priddy, **Assessment of the thermal degradation characteristics of isomeric polystyrenes using TG, TG/MS and TG/GC/MS.** *Thermochimica Acta* (2003), 396(1-2), 167-177.

Matthews, Bryan R.; Pike, William; Rego, Jose M.; Kuch, P. D.; Duane Priddy, **Radical styrene polymerization in the presence of trace levels of sulfonic acids.** *Journal of Applied Polymer Science* (2003), 87(5), 869-875.

Duane Priddy and Howell, Bob A., **Utility/limitations of nitroxide mediated polymerization for low cost manufacture of improved styrenic polymers.** *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* (2002), 43(2), 102-103.

Smith, Patrick B.; Buzanowski, Walter C.; Gunderson, Judy J.; Duane Priddy; Pfenninger, Lance. **Characterization of phase partitioning of additives in rubber modified plastics.** *Annual Technical Conference - Society of Plastics Engineers* (2002), 60th(Vol. 2), 2030-2034.

Howell, B. A.; Powers, J. J.; Duane Priddy. **Synthesis and structure determination for styrene dimer mimics derived from vinylnaphthalenes.** *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* (2002), 43(1), 386-387.

Howell, B. A.; Powers, J. J.; Duane Priddy. **Impact of the presence of acid on the thermal decomposition of the styrene dimer mimics, 1,2,3,10a-tetrahydrophenanthrene-1,2-dicarboxylic anhydride and 2,3,4,4a-tetrahydrophenanthrene-3,4-dicarboxylic anhydride.**

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Howell, B. A.; Powers, J. J.; Duane Priddy, **Thermal decomposition of styrene dimer mimics derived from vinylnaphthalenes.** Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(1), 362.

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Howell, Bob A.; Cui, Yumin; Duane Priddy, **Assessment of the thermal degradation characteristics of isomeric poly(styrene)s using TG, TG/MS, and TG/GC/MS.** Proceedings of the NATAS Annual Conference on Thermal Analysis and Applications (2001), 29th 780-786.

Howell, Bob A.; Cui, Yumin; Duane Priddy, **Determination of residual levels of unsaturation in partially hydrogenated poly(2,3-diphenyl-1,3-butadiene) using thermogravimetry.** Proceedings of the NATAS Annual Conference on Thermal Analysis and Applications (2001), 29th 660-666.

Kim, Yongsin; Harwood, H. James; Duane Priddy. **Catalytic reduction of residual styrene monomer in polystyrene.** Journal of Applied Polymer Science (2002), 83(8), 1786-1791.

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Howell, B. A.; Cui, Y.; Duane Priddy, **Thermal decomposition characteristics of structurally diverse polystyrenes.** Proceedings of the NATAS Annual Conference on Thermal Analysis and Applications (2000), 28th 279-282.

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Kobatake, Seiya; Harwood, H. James; Quirk, Roderic P.; Duane Priddy, **Synthesis of Nitroxide-Functionalized Polybutadiene Using Halogen-Containing Benzyloxyamine as Terminators for Anionic Polymerization. [Erratum to document cited in CA130:139745].** *Macromolecules* (1999), 32(26), 9080.

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Li, I. Q.; Knauss, D. M.; Gong, Y.; Pan, B.; Howell, B. A.; Duane Priddy, **Dual functional initiators for tandem radical and step polymerization.** *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* (1998), 39(2), 598-599.

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Zhu, Yucheng; Li, I. Q.; Howell, B. A.; Duane Priddy, **Nitroxide-mediated radical polymerization:**

**end-group analysis.** ACS Symposium Series (1998), 685(Controlled Radical Polymerization), 214-224.

Kobatake, Seiya; Harwood, H. James; Quirk, Roderic P., Duane Priddy, **Block copolymer synthesis by styrene polymerization initiated with nitroxy-functionalized polybutadiene.** Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1997), 38(2), 664-665.

Li, I. Q.; Howell, B. A.; Dineen, M. T.; Kastl, P. E.; Lyons, J. W.; Meunier, D. M.; Smith, P. B.; Duane Priddy, **Block Copolymer Preparation Using Sequential Normal/Living Radical Polymerization Techniques.** Macromolecules (1997), 30(18), 5195-5199.  
Allan, David S.; Maecker, Norbert L.; Duane Priddy; Schrock, Nancy J. **Modeling Photodegradation in Transparent Polymers.** Macromolecules (1994), 27(26), 7621-9.

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### Most Recent 50 US Patents

#### PAT. NO. Title

- 7,320,201 Hollow plastic block assembly for wall construction
- 6,573,349 High molecular weight monovinylidene aromatic polymers with good processability
- 6,503,992 Phosphorous-containing monomers and flame retardant high impact monovinylidene aromatic polymer compositions derived therefrom
- 6,214,945 Process for producing high molecular weight styrenic polymers and polymodal compositions
- 6,156,855 Production of branched polymers
- 6,084,044 Catalyzed process for producing high molecular weight monovinylidene aromatic polymers
- 5,990,255 High molecular weight polystyrene production by vinyl acid catalyzed free radical polymerization
- 5,962,605 High molecular weight polystyrene production by vinyl acid catalyzed free radical polymerization
- 5,959,033 Polymers containing highly grafted rubbers
- 5,948,874 Acid catalyzed polymerization
- 5,721,320 In situ block copolymer formation during polymerization of a vinyl aromatic monomer
- 5,677,388 Difunctional living free radical polymerization initiators
- 5,663,252 Process for preparing a branched polymer from a vinyl aromatic monomer
- 5,650,106 Extruded foams having a monovinyl aromatic polymer with a broad molecular weight distribution
- 5,627,248 Difunctional living free radical polymerization initiators
- 5,618,900 Free radical polymerization
- 5,473,031 Branched polystyrene production by free radical bulk polymerization
- 5,408,023 Preparation of modified vinyl polymers
- 5,347,055 Oligomers of styrene as flegmatizers for organic peroxides
- 5,194,658 Process for making 2-amino-3-methyl-1-naphthalenecarbonitrile

- 5,194,527 Preparation of ketone containing photodegradable polymers
- 5,187,249 Degradable B-alkoxy vinyl ketone resin composition
- 5,145,924 Free radical polymerization of styrene monomer
- 5,115,058 Bio- and photo-degradable resin composition
- 5,115,055 Hydroperoxide catalyzed free radical polymerization of vinyl aromatic monomers
- 5,087,738 Multifunctional cyclobutane peroxide polymerization initiators
- 5,079,322 Multifunctional cyclobutane peroxide polymerization initiators
- 5,034,485 Multifunctional cyclobutane peroxide polymerization initiators
- 4,910,274 Preparation of monohydroxy-containing polymers
- 4,895,907 Polymerization process using bisquinone peroxide catalyst
- 4,859,748 Process for anionic polymerization in a continuous stirred tank reactor
- 4,812,530 Polyether-polycarbonate-polyether triblock copolymers
- 4,812,514 Polymer blends
- 4,806,599 Polyolefin/polycarbonate/polyolefin triblock copolymers
- 4,789,730 Preparation of polycarbonate having reduced cyclic carbonate oligomer content
- 4,725,654 Process for anionic polymerization
- 4,704,431 Blends of polypropylene and vinylaromatic/.alpha.-methylstyrene copolymers
- 4,647,632 Production of copolymers of .alpha.-methylstyrene
- 4,572,819 Apparatus for anionic polymerization wherein the molecular weight of the polymer is closely controlled
- 4,389,517 Hydrogenation of phenylacetylene prior to styrene polymerization
- 4,288,379 Hydrocarbon poly(gem-bis(t-alkylperoxy)alkanoates derived from .beta.-keto-acids
- 4,275,182 Process for the preparation of improved styrene acrylic acid copolymers
- 4,195,169 Devolatilizing polymers of styrene and acrylic or methacrylic acid
- 4,178,263 Organic peroxide compositions
- 4,131,728 Method for polymerizing olefinically unsaturated monomers employing a catalyst composition comprising (a) shock-sensitive organic peroxide and (b) an olefinic unsaturated non-homopolymerizable monomer
- 4,087,599 Preparation of a water-soluble polyvinylbenzyl quaternary ammonium halide
- 4,052,464 Process for the manufacture of di-t-butylperoxy ketals
- 4,029,685 Peroxy esters of pyromellitic acid

**Ph.D. Dissertation**

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