

## Thomas Patrick Schuman

## Curriculum Vitae February 2022

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### Education

- Postdoctoral Fellowship University of Southern Mississippi, Department of Polymer Science, Advisor: Shelby F. Thames, Industrial agricultural materials, coating and corrosion science.
- Doctorate of Philosophy University of Alabama in Huntsville, Huntsville, AL, Materials Science, December 1992. Advisor: J. Milton Harris, Dissertation title: "Hydrophilic Polymers for Surface Modification."
- Bachelor, Master of Science University of Alabama in Huntsville, Huntsville, AL, B.S., Chemistry, December 1986; M.S., Chemistry, May 1989

### Experience

- September 2015 – present Professor of Chemistry, Missouri University of Science and Technology, Rolla, Missouri
- January 2005 – August 2015 Associate Professor of Chemistry, Missouri University of Science and Technology (formerly University of Missouri-Rolla)
- August 1999 – August 2005 Assistant Professor of Chemistry, University of Missouri Rolla, Rolla, MO. Research: Coating science, corrosion inhibition, adhesion, ceramic-polymer dielectric composites, syntheses of active metal nanoparticles, nanocomposite interfaces.
- August 1993 – August 1999 Postdoctoral fellow, Department of Polymer Science, University of Southern Mississippi, Hattiesburg, MS.
- December 1992 – August 1993 Good manufacturing procedure (cGMP) author, auditor, and synthetic chemist for Shearwater Polymers, Church Street, Huntsville, Alabama.

### Professional Associations and Offices

- American Chemical Society (ACS) member since 1990  
South Central Missouri local ACS section Chair elect, 2001; Chairperson 2002  
ACS Chemistry Week, local section activities chair 2003-2014  
Board Member, Midwest Regional Meeting Board; Rep. ACS So. Central Missouri Local Section, 2005 to present. Board Secretary 2015-16. Chair Elect 2016-17. Chair 2017-18.  
International and American Association for Dental Research 2009-13  
The Federation of Societies of Coatings Technology (FSCT) 1996-13  
Conference Technical Agenda Planning Committee, November 2005–13  
Missouri S&T Teacher Education Program Advisory Board, 2005 – present  
TMS 2013-present

### Other Organizations

- Vestry member, Christ Church Episcopal, Rolla, MO, 2005-08; 2012-15; 2018-21.  
Junior Warden, 2012-15; 2018-21  
Senior Warden 2007, during Rector vacancy, Christ Church Episcopal, Rolla, MO, Jan 2007-08.  
Construction oversight group, Christ Church Episcopal, Rolla, MO, 2003-2004.  
Rector Search Committee, Christ Church Episcopal, Rolla, MO, 2002.  
Mission Committee, Episcopal Church of the Ascension, Hattiesburg, MS. Responsibilities included financial, building/maintenance, and organizational decisions and planning. Reorganized the church from Family toward Program structure. December 1994 - December 1997.  
Craft Program Advisory Committee, Hattiesburg High School, Hattiesburg, MS. August 1996 - May 1998.

## Service

### *Ad hoc Journal review*

Journal of Colloid and Interface Science	Journal of Materials Research
Metallurgical and Materials Transactions B	Materials Science and Engineering B
Materials Chemistry and Physics	Progress in Organic Coatings
Chemistry of Materials	ACS Applied Materials & Interfaces
Journal of Coatings Technology	Industrial Crops and Products
Iranian Polymer Journal	Journal of Applied Polymer Science

### *Symposium Organization*

International Coatings Expo, Technical Program Committee, FSCT/ACA 2006-2013  
Co-organizer: 2<sup>nd</sup> Symp. Recycling of Electronic Wastes, TMS, San Diego, 27-28 February 2011

### *Ad hoc Proposal review*

USDA IFAFS proposal review panel 2001  
NSF SBIR/STTR Phase I Panel F-1 Review, 2002  
USDA SBIR/STTR Phase I review 2002  
NSF SBIR/STTR Phase I Panel Review, Materials Processing, 2003  
USDA NRI proposal review 2000-2004  
USDA SBIR/STTR Phase I review 2004  
USDA SBIR/STTR Phase II review 2011  
NSF SBIR Phase I Panel Review, Recycling, 2006, 2007, 2009, 2010  
NSF SBIR Phase I Panel Review, Polymers and Polymeric Materials, 2010  
SERDP 2010, 2012  
NSF Materials Processing and Manufacturing 2013  
ACS Petroleum Research Fund 2014

### *College/Campus Committees*

Campus Environmental, Health, and Safety; and “Green Campus” committees 2010-2017  
Sustainability Minor advisory committee 2010 – 2012, 2018 – 22  
Campus Curriculum Committee 2000-2003; 2012 to present, Chairperson for 2014-2015  
College of Arts and Science Curriculum Committee 2003-2005  
Library Learning and Resource Committee (LLRC, faculty senate representative), 2012-2017  
LLRC chair 2013  
Campus budget oversight committee 2012-2013  
Rules, Procedures, and Agenda standing committee of Faculty Senate 2013-18, chair 2017-18  
Faculty Senate President Elect 2015, President ProTem 2015-16, President 2016-17, Past President 2017-18  
Title IX panelist, 2015 to present; hearing panel chair March 2019  
Chancellor’s Committee on Diversity and Inclusion, AY 2019-22

### *University of Missouri-System*

Intercampus Faculty Council, Missouri S&T representative: 2015-2018, Chairman, 2017-18

### *Chemistry Department Liaison/Committees*

Freshman chemistry student and ad hoc transfer student advisor 2008 to present  
Certified Teaching academic program committee board member and student advisor 2003-22  
Academic Council/Faculty Senate representative 2000-2005/2010-2016  
Library Liaison 1999 – present  
Personnel committee 1999 – present (chair 2021-22)  
Undergraduate affairs committee (chair) 1999 – present

### *Student Group Advisor*

Schrenk Society, ACS student affiliate group (Co-advisor) 2003- present  
Navigators 2010 – 2012  
Fraternity of Intercollegiate Knights 2000-2010

## Professional Nominations/Awards

Outstanding Analytical Chemistry Student Award, Univ. of Al Huntsville, 1985  
New Faculty Teaching Scholar, University of Missouri, 2000-2001

Who's Who Among America's Teachers, 2002  
 Outstanding Paper Award in Coatings Technologies, Waterborne, Higher Solids, and Powder Coatings Symposium, February 2002  
 Best Technical Poster Presentation, International Coatings Expo, October 2002  
 Who's Who in the Sciences, 2004  
 Outstanding 300 level instructor, Department of Chemistry, 2006, 2009; 2012-2013.  
 Outstanding 400 level instructor, Department of Chemistry, 2011-2012  
 Invited speaker, "Role of solvent in producing adhesion to polymer surfaces," 7<sup>th</sup> International Coatings for Plastics Symposium, Troy, Michigan, 7-9 June 2004.  
 Invited speaker, "An In-Mold Application Of Adhesion Promoters To Polyolefin Substrates," Fifth International Symposium On Polymer Surface Modification, Toronto, Canada, June 20-22, 2005.  
 Invited speaker, "Non-chromate corrosion inhibition technologies," Gordon Research Conference, Coatings and Films, July 10-15, 2005.  
 Invited speaker, "Dye Adsorption Thermodynamics and Relevance to Surface Migration," Midwest Regional ACS Symposium, Joplin, Missouri, 27-28 October 2005.  
 ICE 2006 Technical Focus Plenary Lecturer "Smart Corrosion Inhibition Strategies: Substrate, Coating and Inhibitors," International Coatings Expo, New Orleans, LA, November 1-3, 2006.  
 Invited speaker, "High energy density capacitors," ONAMI/EPRI, Charlotte, NC, June 22-23, 2011.  
 TRFA 2011 Excellence in Thermoset Polymer Research Award "Epoxidized Glycidyl Ester of Soybean Oil as Reactive Diluent for Epoxy Resin." with graduate student Rongpeng Wang.  
 AOCs 2012 Industrial Oil Products Div. Student Award "Synthesis and Properties of Glycidyl Esters of Epoxidized Fatty Acids." with graduate student Rongpeng Wang.  
 Invited speaker, "Influence of the Composite Filler-to-Matrix Interface on Bulk Properties," Missouri State University, Springfield, MO, 1 February 2012.  
 Invited speaker, "Enhanced Dielectric Breakdown Strength and Permittivity Composites," Missouri S&T Physics dept. 14 February 2013  
 Invited speaker, "Polymer Materials," Penford Products, Cedar Rapids, IA, 27 June 2013.  
 Invited speaker, "Toward Biocompatible Bone Cements," Univ of So. Mississippi, MS 3 Oct 2013.  
 Invited speaker, "Designing Materials Interfaces," Univ of Cincinnati, OH, 1 Nov 2013.  
 Invited speaker, "High Performance Biobased Monomers," NIMTE, Ningbo, China, Aug 2014.  
 Invited series speaker, "Polyaniline Dopant Effects On Corrosion Inhibition Of Steel," "Designing Polymer-Aggregate Interfaces in Cement Composite," "The Practical Use of SRET in Surface Corrosion Assessments," "Biocompatible Bone Cement," "The Art of Formulation."  
 Visiting Fellowship, Chinese Academy of Science President's International Fellowship Initiative, Ningbo Institute of Industrial Technology, Ningbo, China, 2016.  
 Leadership Development Program, University of Missouri 2016-2017.  
 Invited speaker, "Development and Evaluation of Ultra-High Temperature Resistant Preformed Particle Gels for Conformance Control in North Sea Reservoirs," Proceedings of the SPE Annual Technical Conference and Exhibition (2021, Dubai, UAE), Society of Petroleum Engineers (SPE), Sep 2021.

## Teaching

### Lecture Courses and Labs

General Chemistry 1310	Fall'99 – present
Organic Chemistry I 2210	Ugrad lecture
Organic Chemistry II 2220	Ugrad lecture
Organic Chemistry I Lab 2219	Ugrad wet lab
Polymer Chemistry 4810/5810	Graduate/Ugrad lecture
Polymer Chemistry and Coatings Lab 4819/5819	Graduate/Ugrad Lecture/Advanced Wet Lab
Polymer Coatings and Technology 4850/5850	Grad/Undergrad lecture
Physical Polymer Chemistry 6840	Graduate lecture
Corrosion Chemistry and Engineering 401	Graduate lecture
Organic Synthesis and Spectroscopy 4297	Graduate/Ugrad Lecture/Advanced wet lab

### University Extension

Short course lecturer for Missouri S&T Paint and Coatings Institute; Distance Education

Polymer Chemistry and Organic Coatings: Emulsion polymerization, Thermal characterization, Characterization of colloidal particles, Dispersion, LASD/sealer (coatings), PT/ED, ELPO

### Research Group

Postdoctoral	0, current; 4 in last 10 years
Graduate students, current	3; also co-advise 2 graduate students
Undergraduate students	5
Master students graduated	5 (3 chemical engineering; 2 chemistry)
Doctoral students graduated	10 (2 co-advised w/ James O. Stoffer, 2 co-advised w/ K. Chandrashekhara; 1 co-advised Fatih Dogan; 1 co-advised with Baojun Bai)

### Publications, Peer reviewed

Baird, James K. and Schuman, Thomas P., "The relationship between gas-phase and liquid-phase electron-photodetachment cross sections in the threshold region: application to anthracene and perfluorobenzene anions," *Radiat. Phys. Chem.*, **32**(3), 493-6 (1988).

Oesterberg, Eva; Bergstroem, Karin; Holmberg, Krister; Riggs, Jennifer A.; Van Alstine, J. M.; Schuman, Thomas P.; Burns, Norman L.; Milton Harris, J., "Comparison of Polysaccharide and Poly(ethylene glycol) Coatings for Reduction of Protein Adsorption on Polystyrene Surfaces," *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **77**(2), 159-169 (1993).

Bergstroem, Karin; Oesterberg, Eva; Holmberg, Krister; Hoffman, Allan S.; Schuman, Thomas P.; Kozlowski, Antoni; Harris, J. Milton, "Effects of Branching and Molecular Weight of Surface-Bound Poly(ethylene oxide) on Protein Rejection," *Journal of Biomaterials Science, Polymer Edition*, **6**(2), 123-132 (1994).

Oesterberg, E.; Bergstroem, K.; Holmberg, K.; Schuman, T. P.; Riggs, J. A.; Burns, N. L.; Van Alstine, J. M.; Harris, J. M., "Protein Rejecting Ability of Surface-Bound Dextran in End-On and Side-On Configurations: Comparison to PEG," *Journal of Biomedical Materials Research*, **29**(6), 741-747 (1995).

Thames, Shelby F.; Yu, Haibin; Wang, Min D.; Schuman, Thomas P., "Dehydration of Lesquerella Oil," *Journal of Applied Polymer Science*, **58**, 943 (1995).

Thames, Shelby F.; Yu, Haibin; Schuman, Thomas P.; Wang, Min D., "Acrylated Lesquerella Oil in Ultraviolet Cured Coatings," *Progress in Organic Coatings*, **28**, 299 (1996).

A. Niroomand, S.F. Thames, and T.P. Schuman, "Hydroxylated Guayule Rubber in Powder Coatings," *Journal of Coatings Technology*, **68**(863), 15 (1996).

J. Shi, J.O. Stoffer, T.P. Schuman, "Ink Jet Printing Paper With Improved Waterfastness," *Journal of Coatings Technology Research*, **3**, 225 (2004).

Thomas P. Schuman, Shelby F. Thames, "The Effect of Solvent on Adhesion of Coatings to Plastics," *International Journal of Coatings Science*, **1** (2004).

Thomas P. Schuman, "Protective Coatings for Aluminum Alloys," In: Handbook of Environmental Degradation of Materials," Myer Kutz, (Ed.), Chapter 17, William Andrew Publishing, New York, 2005.

Ahmed Shahin, Fernande Grandjean, Gary J. Long, Thomas P. Schuman, "Cerium L<sub>III</sub>-edge EXAFS Investigation of the Structure of Crystalline and Amorphous Cerium Oxides," *Chemistry of Materials*, **17**(2), 315 (2005).

Y. Liu, M. J. O'Keefe, A. Beyaz, T. Schuman, "Synthesis and Characterization of Aluminum-Polyaniline Thin Films and Membranes," *Surface and Interface Analysis*, **37**, 782 (2005).

Thomas Schuman, Shelby F. Thames “Solvent Effects Producing Adhesion to Molded Polymer Surfaces,” *Journal of Adhesion Science and Technology*, **19**, 1207-1235 (2005).

Lynell Gilbert, Thomas P. Schuman, Fatih Dogan, Mike Krogh, “Dielectric Powder/Polymer Composites for High Energy Density Capacitors,” In: *Ceramic Transactions*, Vol. **179**, Advances in Electronic and Electrochemical Ceramics, edited by F. Dogan and P. Kumta, The American Ceramic Society, Westerville, OH, pp. 17-26 (2005).

Thomas P. Schuman, “Smart Corrosion Inhibition Strategies,” *JCT Coatings Tech*, **4**(2), 60-70 (2007).

Thomas P. Schuman, Maninder Singh, James O. Stoffer, “An In-Mold Application Of Adhesion Promoters To Polyolefin Substrates,” In: *Polymer Surface Modification: Relevance to Adhesion*, **4**, K.L. Mittal (Ed.), VSP, Leiden, Netherlands, 2007, pp. 263-284.

A. Shabeer, S. Sundararaman, K. Chandrashekhara, T.P. Schuman, “Synthesis and characterization of soy-based epoxy-montmorillonite clay nanocomposites,” *Journal of Composite Materials*, **41**(15), 1825 (2007).

S. Sundararaman, A. Shabeer, K. Chandrashekhara and T. Schuman, "Impact Behavior of Fiber Reinforced Pultruded Soy-Epoxy Composites," *Journal of Biobased Materials and Bioenergy*, **2**(1): 71-77 (2008).

Schuman, T.P., Siddabattuni, S., Cox, O., and Dogan, F., “Improved Dielectric Breakdown Strength of Covalently-Bonded Polymer-Particle Nanocomposites." *Composite Interfaces*, **17**, 719–731 (2010).

Zuo, Xiangjun; Damoah, Lucas N. W.; Zhang, Lifeng; Schuman, Thomas; Kers, Jaan, “Green pyrolysis of used printed wiring board powders.” In: *Recycling of Electronic Waste II*. Zhang, Lifeng; Krumdick, Gregory K., Eds., *TMS*, 2011.

Velez, M.; He, Y.; Day, D. E.; Schuman, T. P.; Kilway, K. V.; Melander, J. R.; Weiler, R. A.; Miller, B. D.; Nalvarte, E. L.; Eick, J. D., “Processing of yttrium aluminosilicate (YAS) glasses for dental composites,” *Ceramica (Sao Paulo, Brazil)*, **57**(341), 393-401 (2011).

Siddabattuni, S., Schuman, T.P., and Dogan, F., “Dielectric Properties of Interface Controlled Polymer Nanocomposites.” *Materials Science and Engineering B*, **176**, 1422 (2011).

Jennifer R. Melander, Rachael A. Weiler, Bradley D. Miller, Thomas P. Schuman, Kathleen Kilway, Delbert E. Day, Mariano Velez, J. David Eick, “Model of photoinitiated silorane composite for biomedical applications.” *Journal of Biomedical Materials Research, Part B: Applied Biomaterials*, **100**(1): 163-169 (2012).

Sherea M. Stricklin, B.A.; William V. Stoecker M.S., M.D.; Ryan K. Rader, B.S., Antoinette F. Hood, M.D., Jerome Z. Litt, M.D., Thomas P. Schuman, Ph.D. “Edematous-Plaque Photosensitivity Observed with Sitagliptin Phosphate (Januvia),” *Dermatology Online Journal*, **18**(2), 9 (2012).

Thomas P. Schuman, “Protective Coatings for Aluminum Alloys,” In: *Handbook of Environmental Degradation of Materials*, 2<sup>nd</sup> edition, Myer Kutz, (Ed.), Chapter 17 (pp. 345-366), William Andrew Publishing, 2013.

Ryan K. Rader, William V. Stoecker, ,Kristen A. Hinton, Janine C. Malone, and Thomas P. Schuman, “CD30+ reversible lymphoid dyscrasia (pseudolymphoma) following HIDA scintigraphy and the [Ring1]-[Ring2]-[C=O] generalized structure hypothesis,” *Journal of the American Academy of Dermatology*, **68**(3), e99-e101 (2013).

- Rongpeng Wang and Thomas Schuman, "Epoxidized Glycidyl Ester of Soybean Oil as Reactive Diluent for Epoxy Resin," *eXpress Polymer Letters*, **7** (3), 272-292 (2013).
- Sasidhar Siddabattuni, Vladimir Petrovsky, Thomas P. Schuman, Fatih Dogan, "Impedance Spectroscopy of Dielectric Nanoparticle Slurries," *Journal of American Ceramic Society*, **96**(5), 1490–1496 (2013).
- Siddabattuni, S., Schuman, T.P., and Dogan, F., "Influence of Electronic Nature of Filler Surfaces on Dielectric Properties of Polymer-Particle Nanocomposites." *ACS Applied Materials and Interfaces*, **5**, 1917-1927 (2013).
- V. G. K. Menta, R. R. Vuppapapati, K. Chandrashekhara, T. Schuman, and J. Sha, "Elevated-temperature vacuum-assisted resin transfer molding process for high performance aerospace composites," *Polymer International*, **62**(10), 1465–1476 (2013).
- M. Velez, T. P. Schuman, and D. E. Day, "Optical Properties of Optically Transparent Glass-Ribbon Composites (OTRCs)," *Journal of Composite Materials*, **48**(30) 3747-3754 (2014).
- Mohamed, M. M., Vuppapapati, R. R., Bheem Reddy, V., Chandrashekhara, K., and Schuman, T., "Characterization Of Polyurethane Composites Manufactured Using Vacuum Assisted Resin Transfer Molding," *Advanced Composite Materials*, April 2014.
- R. R. Vuppapapati, V. G. K. Menta, K. Chandrashekhara, T. Schuman, "Manufacturing and Impact Characterization of Soy-Based Polyurethane Pultruded Composites," *Polymer Composites*, **35**(6), 1070-1077 (2014).
- V.G.K. Menta, R.R. Vuppapapati, K. Chandrashekhara and T. Schuman, " Manufacturing of Transparent Composites Using Vacuum Infusion Process," *Polymer & Polymer Composites*, **22**(9), 843-850 (2014).
- Rongpeng Wang and Thomas P. Schuman, "Fabrication of Bio-based Epoxy-Clay Nanocomposites," *Green Chemistry*, **16**(4), 1871 – 1882 (2014).
- Siddabattuni, Sasidhar; Schuman, Thomas, "Polymer-Ceramic Nanocomposite Dielectrics for Advanced Energy Storage," In: Polymer Composites for Energy Harvesting, Conversion, and Storage, L. Li, W. Wong-Ng, J. Sharp (Eds.), ACS Symposium Series, **1161**, 165-190 (2014).
- Rongpeng Wang and Thomas P. Schuman, "Towards Green: A Review of Recent Developments in Biorenewable Epoxy Resins from Vegetable Oils." In: *Green Materials from Plant Oils*, Z. Liu and G. Kraus (Eds.), chapter 9, Royal Society of Chemistry Green Chemistry Series, **29** (2015), pp. 202-241.
- R. A. A. Upul Ranaweera, Thomas P. Schuman, Rongpeng Wang, Bradley D. Miller, and Kathleen V. Kilway, "Effect of Moisture on Cationic Polymerization of Silicone Epoxy Monomers," *Journal of Applied Polymer Science*, **132**(15), 41831 (2015).
- Liu, Chengguo; Liu, Zengshe; Tisserat, Brent H.; Wang, Rongpeng; Schuman, Thomas P.; Zhou, Yonghong; Hu, Lihong, "Microwave-assisted maleation of tung oil for bio-based products with versatile applications," *Industrial Crops and Products*, **71**, 185-196 (2015).
- Liu, Zengshe; Sharma, Brajendra K.; Erhan, Sevim Z.; Biswas, Atanu; Wang, Rongpeng; Schuman, Thomas P., "Oxidation and low temperature stability of polymerized soybean oil-based lubricants," *Thermochimica Acta*, **601**, 9-16 (2015).
- Sasidhar Siddabattuni, Thomas P. Schuman, "Dielectric spectroscopy and stimulated current analyses of polymer-ceramic nanocomposites," in: Spectroscopy of Polymer Nanocomposites, S. Thomas, D. Rouxel, D. Ponnamma (Eds.), chapter 10, Elsevier, 2016.

Zun Chen, Jiaming Geng, Thomas P. Schuman, and Baojun Bai, "Water-free synthesis of temperature-sensitive polyacrylamide microgels and pore modeled oil recovery performance," *Journal of Applied Polymer Science*, **134**, 44581 (2017).

Pu, Jingyang; Bai, Baojuri Jun; Alhuraishawy, Ali K; Schuman, Thomas P; Chen, Yashu; Sun, Xindi, "A novel re-crosslinkable preformed particle gel for conformance control in extreme heterogeneous reservoirs," *Society of Petroleum Engineers (SPE) Journal*, SPE-191697-MS (2018).

Wang, Ze; Bai, Baojun; Zhou, Enze; Pu, Jingyang; Schuman, Thomas P., "Experimental Evaluation of Oxidizing Breakers for a Polyacrylamide-Based Re-Crosslinkable Preformed Particle Gel," *Energy & Fuels*, **33**(6), 5001-5010 (2019).

Pu, Jingyang, Bai, Baojun, Alhuraishawy, Ali, Schuman, Thomas, Chen, Yashu, Sun, Xindi, "A Recrosslinkable Preformed Particle Gel for Conformance Control in Heterogeneous Reservoirs Containing Linear-Flow Features," *SPE Journal*, SPE-191697-PA (2019).

Anirudh Krishnamurthy, Buddhhabhushan Salunkhe, Ashish Zore, Ali Rownaghi, Thomas Schuman, and Fateme Rezaei, "Amine-Based Latex Coatings for Indoor Air CO<sub>2</sub> Control in Commercial Buildings," *ACS Appl. Mater. Interfaces*, **11**(18), 16594-604 (2019).

Funk G A; Cole K A; McIff T E; Menuey E M; Kilway K V; Schuman T P., "Radical scavenging of poly(methyl methacrylate) bone cement by rifampin and clinically relevant properties of the rifampin-loaded cement," *Bone & Joint Research*, **8**(2), 81-89 (2019).

Jiaming Geng Jingyang Pu, Yang Zhao, Baihua, Lin, Baojun, Bai, Schuman, Thomas P., "pH-Responsive crude oil-in-water Pickering emulsion stabilized by polyacrylamide nanogels," *Fuel*, **258**, 116159 (2019).

Wang, Ze ; Bai, Baojun ; Zhou, Enze; Pu, Jingyang ; Schuman, Thomas , "Experimental Evaluation of Oxidizing Breakers for a Polyacrylamide-Based Re-Crosslinkable Preformed Particle Gel," *Energy & Fuels*, **33**(6), 5001-5010 (2019).

Buddhabhushan Salunkhe, Thomas Schuman, Ali Al Brahim, Baojun Bai, "Ultra-High Temperature Resistant Preformed Particle Gels for Enhanced Oil Recovery," *Chemical Engineering Journal*, **426**, 130712 (2021).

Salunkhe Buddhhabhushan; Schuman Thomas; Al Brahim Ali; Bai Baojun, "Experimental data on water soluble polymers thermal and hydrolytic stability, reactivity ratios of monomers and Frr calculation for thermally stable preformed particle gels therefrom." *Data in Brief*, 38107357 (2021).

Meinders, Robert; Murphy, David; Taylor, Gregory; Chandrashekhara, K.; Schuman, Thomas, "Development of fiber-reinforced transparent composites," *Polymers and Polymer Composites*, **29**(9\_suppl), S826-S834 (2021).

Pu, Jingyang; Bai, Baojun; Schuman, Thomas P., "Systematic Evaluation of a Novel Self-Healing Poly(acrylamide-co-vinyl acetate)/Alginate Polymer Gel for Fluid Flow Control in High Temperature and High Salinity Reservoirs," *Polymers*, **13**(21), 3616 (2021).

Salunkhe, Buddhhabhushan; Schuman, Thomas P., "Super-Adsorbent Hydrogels for Removal of Methylene Blue from Aqueous Solution: Dye Adsorption Isotherms, Kinetics, and Thermodynamic Properties," *Macromol*, **1**(4), 256-275 (2021). DOI: <https://doi.org/10.3390/macromol1040018>

Song, Tao; Zhai, Zhanmiao; Liu, Junchen; Eriyagama, Yugandhara; Ahdaya, Mohamed; Alotibi, Adel; Wang, Ze; Schuman, Thomas; Bai, Baojun, "Laboratory evaluation of a novel self-healable polymer gel for CO<sub>2</sub> leakage remediation during CO<sub>2</sub> storage and CO<sub>2</sub> flooding," *Chemical Engineering Journal*, **444**, 136635 (2022).

Yu, Bowen; Zhao, Shuda; Long, Yifu; Bai, Baojun; Schuman, Thomas, "Comprehensive evaluation of a high-temperature resistant re-crosslinkable preformed particle gel for water management," *Fuel*, **309**, 122086 (2022).

Song, Tao; Feng, Qi; Schuman, Thomas; Cao, Jie; Bai, Baojun, "A novel branched polymer gel system with delayed gelation property for conformance control," *Society of Petroleum Engineers (SPE) Journal*, **27**(1), 105-115 (2022).

Thomas Schuman, Buddhabhushan Salunkhe, Ali Al Brahim, and Baojun Bai, "Evaluation of Ultrahigh-Temperature-Resistant Preformed Particle Gels for Conformance Control in North Sea Reservoirs," *Society of Petroleum Engineers (SPE) Journal*, 1-14 (2022).

Ali Al Brahim, Baojun Bai, Thomas Schuman, "Comprehensive Review of Polymer and Polymer Gel Treatments for Natural Gas Related Conformance Control," *Gels*, **8**, 353 (2022).  
<https://doi.org/10.3390/gels8060353>.

### **Patent Disclosures/Applications**

Hoenig, Stephen M.; Schuman, Thomas P.; Finlayson, Malcolm F.; Dechent, William L.; Thames, Shelby F.; Smith, Oliver W.; Bieser, John O. "Coatings compositions containing polymers of olefins and vinyl or vinylidene aromatic and/or aliphatic or cycloaliphatic vinyl monomers." PCT Int. Appl. WO99-US25826 (2000).

E. Burch, J.O. Stoffer, T.P. Schuman, "Synthesis Of Poly(Ethylene Imine) On An Oxide Support," U.S. Patent 7,947,345, May 24, 2011.

T.P. Schuman, J.O. Stoffer, "Method for application of adhesion promoter to molded polymer surfaces," Provisional U.S. Patent application, filed 16 February 2004.

T.P. Schuman, F. Dogan, Provisional U.S. Patent application, "Interfacial modification of filler surfaces for high energy density capacitors," filed 16 October 2008.

Lynda F. Bonewald, Kathleen V. Kilway, Thomas P. Schuman, "Biomaterial compositions," U.S. Patent 9,186,302, November 17, 2015.

Lynda F. Bonewald, Kathleen V. Kilway, Thomas P. Schuman, "Biomaterial compositions," U.S. Patent 9,770,528, September 26, 2017.

Thomas P. Schuman; "Epoxy phosphonate ester as a coupling agent for transition metal and metal oxide surfaces," U.S. Patent Application, 20170121354, May 4, 2017.

Pu, J., Bai, B., and Thomas, S. "Re-assembling polymer particle package for conformance control and fluid loss control." U.S. Patent 11,162,016, 2 November 2021.

Rezaei, Fateme; Schuman, Thomas P.; Morrison, Glenn C., "Coating compositions and using the compositions with adsorbent for passively controlling carbon dioxide in enclosed environment," U.S. Pat. Appl. Publ. (2021), US 20210017419 A1 20210121.

Long, Yifu; Bai, Baojun; Schuman, Thomas P., "Re-crosslinking particle gel for CO<sub>2</sub> conformance control and CO<sub>2</sub> leakage blocking," U.S. Patent 11,214,729, 4 January 2022.



Bai, Baojun; Wang, Ze; Sun, Zhe; Pu, Jingyang; Schuman, Thomas, "Fiber assisted re-crosslinkable polymer gel and preformed particle gels for fluid loss and conformance control," U.S. Patent 11,268,009, 8 March 2022.

Song, Tao, Bai, Baojun, Schuman, Thomas P., "Re-crosslinkable hyper-branched polymer gels based on a transamidation reaction," World Patent WO2022098411, 12 May 2022.

Schuman, Thomas; Bai, Baojun; Salunkhe, Buddhabhushan Pundlik, "Nontoxic high temperature-resistant hydrogels," World Patent application WO2022098412, 12 May 2022.

### **Full Paper Publications, Preprints, Non-peer reviewed**

Thames, Shelby F.; Schuman, Thomas P.; Reichel, Louis W.; Purvis, William A.; Poole, Payton W., "Guayule coproducts: emerging technology in industrial, marine, and peelable coatings," *Int. SAMPE Symp. Exhib.*, **41**(2), 1177-1190 (1996).

Schuman, Thomas P. and Thames, Shelby F., "Conductive Powder Coatings of Emeraldine in Epoxy-Polyester," *Proceedings of the 26th International Waterborne, High-Solids, and Powder Coatings Symposium*, New Orleans, LA., February 10-12, 1999, pp. 318-335.

"Scott Hayes, James O. Stoffer, Thomas J. O'Keefe, T. Schuman, S. Patwardhan, E. Morris and Paul Yu, "SRET evaluation of cerium conversion coatings" *Polymer Materials Science and Engineering*, **85**, 140-141 (2001).

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T.P. Schuman, A. Shahin, and J.O. Stoffer, "Cerium-Based Inhibitors Of Aluminum Alloy Corrosion," *Proceedings of the 29th International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 6-8, 2002, pp 371-382.

J. Shi, J.O. Stoffer, and T.P. Schuman, "Quantitative Spectrophotometric Methods For Waterfastness Measurement," National ACS Meeting, Boston, MA, August 19-22, 2002.

J. Shi, J.O. Stoffer, and T.P. Schuman, "Ink Jet Printing Paper With Improved Waterfastness," *Proceedings of the 30th International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 26-28, 2003, p. 153.

Thomas P. Schuman, Shantanu V. Patwardhan, Scott A. Hayes, Pu Yu, James O. Stoffer, and Thomas J. O'Keefe, "The Practical Use of SRET in Surface Corrosion Assessments," Gateway Coatings Symposium, St. Louis, MO, June 2002.

Schuman, T.P.; Beyaz, A.; Liu, Y.; and O'Keefe, M., "Acoustic characterization of metal/polymer membrane enclosures," *Proceedings of SPIE*, **5090**, 88 (2003).

Thomas P. Schuman, Shelby F. Thames, "The Effect of Solvent on Adhesion of Coatings to Plastics," *Proceedings of the 31st International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 18-20, 2004.

Thomas Schuman, Shelby F. Thames "Solvent Effects Producing Adhesion to Molded Polymer Surfaces," (Invited paper) *7th International Coatings for Plastics Symposium*, Troy, MI, June 7-9, 2004.

Ahmed Shahin, Thomas P. Schuman, Fernande Grandjean, Gary J. Long, "Cerium L<sub>III</sub>-edge EXAFS Investigation of the Structure of Crystalline and Amorphous Cerium Oxides," *Prepr. Div. Fuel Chem.*, **49**(2), 759-761 (2004).

Thomas P. Schuman, Yasir Idlibi, "Polyaniline dopant effects on corrosion inhibition of steel," *International Coatings Expo*, Chicago, IL, October 27-29, 2004.

Thomas P. Schuman, Shelby F. Thames "Image of a "Bitten" Molded Polymer Surface: Solvent-Induced Adhesion," *International Coatings Expo*, Chicago, IL, October 27-29, 2004.

Abhishek Manohar, Fatih Dogan, Lynell Gilbert, Thomas Schuman, "Dielectric Properties of Particles in Suspensions and Polymer Composites," *International Seminar on Dielectric and Piezoelectric Ceramics*, **12**, 389, Annapolis, Maryland, November 6-9, 2005.

Thomas P. Schuman, Meryss Kafka Duda, Ahamed Shabeer, K. Chandrashekhara "Soy Epoxy Nanoclay Composite Coatings," *34<sup>th</sup> International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 14-16, 2007.

V. G. K. Menta, K. Chandrashekhara, and Thomas P. Schuman, "Manufacturing of transparent composites using vacuum infusion process," Proceedings of the 4th Annual ISC Research Symposium, ISCRS 2010, April 21, 2010, Rolla, Missouri.

R. R. Vuppalapati, V. G. K. Menta, T. Schuman and K. Chandrashekhara, "Synthesis and Characterization of Soy-based Aliphatic Polyurethane Nanocomposites Compatible for Pultrusion," *SAMPE Technical Conference*, Long Beach, CA, pp.1-12, May 23-26, 2011.

Rongpeng Wang and Thomas Schuman, "Epoxidized Glycidyl Ester of Soybean Oil as Reactive Diluent for Epoxy Resin," 2nd Annual Excellence in Thermoset Polymer Research Award Competition, Thermoset Resin Formulators Association, June 2011.

Thomas P. Schuman, S. Siddabattuni, "Electron scavenging nature of filler surfaces for high energy density polymer-particle nanocomposites," *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* (2011), **52**(2), 92-93.

Thomas P. Schuman, S. Siddabattuni, "Interface controlled high energy density epoxy-barium titanate nanocomposite dielectrics," *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* (2011), **52**(2), 47-48.

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Thomas P. Schuman, Rongpeng Wang, "Epoxidized glycidyl esters of soy/linseed oil: synthesis and thermal properties," *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* (2011), **52**(2), 1048-1049.

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M. Mohamed , R. R. Vuppalapati, S. Hawkins, K. Chandrashekhara, and T. Schuman, "Impact characterization of polyurethane composites manufactured using vacuum assisted resin transfer molding," IMECE, 2012-88267, November 9-15, 2012, Houston, Texas.

Pu, J., Bai, B., Alhuraishawy, A.K., Schuman, T., Chen, Y., and Sun X. (2018). Development of re-assembling performed particle gel (RPPG) for conformance control in mature oilfields with conduits/fractures/fracture-like channels. SPE Annual Technical Conference and Exhibition, Dallas, TX, USA.

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### **Presentations, Abstracts**

“Guayule Rubber PSA’s,” presented at the AIC meeting, New Orleans, LA, October 1993.

“Chlorinated Maleinized Guayule Rubber Powder Coatings,” presented to International AAIC meeting, Catamarca, Argentina, October 1995.

“Dehydrated Lesquerella Oil Alkyd Coatings,” presented to International AAIC meeting, Catamarca, Argentina, October 1995.

“Acrylated Lesquerella Oil in Ultraviolet Cured Coatings,” presented at the Low/No VOC Conference, Research Triangle, North Carolina, (1996).

“Guayule coproducts: emerging technology in industrial, marine, and peelable coatings,” presented at *41st International SAMPE Symposium*, 1996.

“Aryl Silicon Powder Coatings,” presented at the Proceedings of the Silicones in Coatings conference, Paint Research Association, Brussels, Belgium, January 1996.

“Conductive Powder Coatings of Emeraldine in Epoxy-Polyester,” presented at the *26th International Waterborne, High-Solids, and Powder Coatings Symposium*, New Orleans, LA., February 10-12, 1999.

“Deposition and Characterization of Metal/Polyaniline Bilayers,” presented at *MRS National Meeting* (2001).

T.P. Schuman, J. Shi, N. Bansal, and H. Kundeti, “Dye Adsorption Thermodynamics and Relevance to Surface Migration,” Midwest Regional ACS Symposium, Joplin, Missouri, October 2005.

“Cerium-Based Inhibitors Of Aluminum Alloy Corrosion,” presented at the *29th International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 6-8, 2002.

“XPS Characterization of Ce(III/IV) Complexes,” presented at the Middle Atlantic Regional ACS Symposium, Fairfax, Virginia, May 2002.

“The Practical Use of SRET in Surface Corrosion Assessments,” presented at the Gateway Coatings Symposium, St. Louis, MO, June 2002.

“Quantitative Spectrophotometric Methods For Waterfastness Measurement,” presented at the National ACS Meeting, Boston, MA, August 19-22, 2002.

“XPS Characterization of Ce(III/IV) Complexes,” presented at the National ACS Meeting, Boston, MA, August 19-22, 2002.

“Ink Jet Printing Paper With Improved Waterfastness,” presented at the *30th International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 26-28, 2003.

“Dopant Effects in the Corrosion Protection of Steel by Polyanilines,” presented at the National ACS meeting, New Orleans, LA, 2003.

“XPS Characterization of Metal/Polyaniline Interactions,” presented at the National ACS meeting, New Orleans, LA, 2003.

“State of the Art Corrosion Inhibition by Inherently Conductive Polymers and Rare Earth Materials,” presented at the Gateway Coatings Symposium, St. Louis, MO, June 2003.

“Acoustic characterization of metal/polymer membrane enclosures,” SPIE 17th Annual AeroSense Symposium, Orlando, FL, 21 April 2003.

“Acoustic Packaging of Microelectrical Mechanical Sensor (MEMS) Microphones by Polyaniline Membranes and Porous Composites,” DARPA PI meeting, Aberdeen Proving Ground, Aberdeen, MD, 10-15 August 2003.

“Ink Jet Printing Paper With Improved Waterfastness,” presented at Particles 2003, Toronto, Ontario, 26-28 August 2003.

“The Effect of Solvent on Adhesion of Coatings to Plastics,” presented at the *31<sup>st</sup> International Waterborne, High-Solids, and Powder Coating Symposium*, New Orleans, LA., February 18-20, 2004.

Thomas P. Schuman, Maninder Singh, James O. Stoffer, “A Novel Application of Adhesion Promoter to Molded Plastics,” presented to Eastman Chemical as technology transfer of provisional patent, New Orleans, LA., February 18-20, 2004.

Thomas P. Schuman, Jinzhen Shi, James O. Stoffer, “Synthesis and Characterization: Quaternary Ammonium Modified Boehmites and Silicas,” Hewlett Packard, San Diego, CA, 18 March 2004.

Thomas P. Schuman, Jinzhen Shi, James O. Stoffer, “Surface Wetting and Print Performance: Surface Modified Boehmites and Silicas,” Hewlett Packard, San Diego, CA, 18 March 2004.

Thomas Schuman, Shelby F. Thames “Solvent Effects Producing Adhesion to Molded Polymer Surfaces,” (Invited presentation) *7<sup>th</sup> International Coatings for Plastics Symposium*, June 7-9, 2004.

Jinzhen Shi, Thomas Schuman, James Stoffer, “Adsorption of anionic dyes on cationically modified boehmite (gamma- $\text{AlOOH}$ ) from aqueous solution,” *Inorganic Division*, ACS National Meeting, Philadelphia, PA, August 22-26, 2004.

Jinzhen Shi, Thomas Schuman, James Stoffer, “Characterization of silane surface treated boehmite (gamma- $\text{AlOOH}$ ),” *Inorganic Division*, ACS National Meeting, Philadelphia, PA, August 22-26, 2004.

Jinzhen Shi, Thomas Schuman, James Stoffer, “Synthesis of cationically modified boehmite (gamma- $\text{AlOOH}$ ) with silanes bearing quaternary ammonium functionality,” *Inorganic Division*, ACS National Meeting, Philadelphia, PA, August 22-26, 2004.

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Jinzhen Shi, Vinita Pandit, Thomas Schuman, Massimo Bertino, Akira Tokuhiko, “Synthesis and characterization of titanium nanoclusters using gamma radiolysis in organic media,” *Inorganic Division*, ACS National Meeting, Philadelphia, PA, August 22-26, 2004.

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Thomas P. Schuman, Yasir Idlibi, "Investigation of Alkylphosphate Doped Polyanilines as Corrosion Inhibitors," poster presentation, *International Coatings Expo*, Chicago, IL, October 27-29, 2004.

Thomas P. Schuman, Yasir Idlibi, "Polyaniline dopant effects on corrosion inhibition of steel," *International Coatings Expo*, Chicago, IL, October 27-29, 2004; *Journal of Coatings Research*, in press.

Thomas P. Schuman, Shelby F. Thames "Image of a "Bitten" Molded Polymer Surface: Solvent-Induced Adhesion," *International Coatings Expo*, Chicago, IL, October 27-29, 2004.

T.P. Schuman, J. Shi, N. Bansal, and H. Kundeti, "Dye Adsorption Thermodynamics and Relevance to Surface Migration," Midwest Regional ACS Symposium, Joplin, Missouri, October 2005.

T.P. Schuman, M. Singh, J.O. Stoffer, "An In-Mold Application Of Adhesion Promoters To Polyolefin Substrates", *Fifth International Surface Modification of Plastics: Relevance to Adhesion Symposium*, Toronto, ON, June 20-22, 2005.

Schuman, Thomas P., "Dye Adsorption Thermodynamics and Relevance to Surface Migration," 40th Midwest Regional Meeting of the American Chemical Society, Joplin, MO, United States, October 26-29 (2005), LIN05-268.

Gilbert, Lynell J.; Schuman, Thomas P.; Dogan, Fatih, "Geometries for Testing Capacitance and the Determination of Dielectric Constant," 40th Midwest Regional Meeting of the American Chemical Society, Joplin, MO, United States, October 26-29 (2005), LIN05-048.

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Thomas P. Schuman, "The IT<sub>2</sub>IS Principle" UMKC Coatings Society, Kansas City, MO, Jan 2009.

Thomas P. Schuman, "Surface Modified Nanoparticles as Enhanced Fillers for Dental Polymer-Particle Composites," IADR 2009, Miami, FL, March 3-8, 2009.

S. Subramani, Thomas P. Schuman, "Surface-Modified Filler Effects on Composite Properties," IADR 2009, Miami, FL, March 3-8, 2009.

Thomas P. Schuman, "Nanoparticle Filled Polymer-Particle Composites," IADR 2010, Washington, D.C., March 1-5, 2010.

S. Siddabattuni, Thomas P. Schuman, "Improved Energy Density by Covalently Bonding Polymer to Particle in Nanocomposite Dielectric Films," Lehigh University's SPE Nanocomposites, March 9-10, 2010.

S. Siddabattuni, Thomas P. Schuman, "Improved Energy Density Dielectric Films," NSF I/UCRC for Dielectric Studies meeting, PennState, May 3-4, 2010.

S. Siddabattuni, Thomas P. Schuman, "Improved Energy Storage Density of Covalently Bonded Polymer-Particle Nanocomposite Dielectric Films," MWRM ACS, Wichita, KS, Oct. 28-29, 2010.

Thomas P. Schuman, S. Siddabattuni, "Influence of the Filler Surface Electronic Structure on Dielectric Properties of Polymer-Particle Nanocomposite Films," MWRM ACS, Wichita, KS, Oct. 28-29, 2010.

Kilway, Kathleen V.; Weiler, Rachel A.; Melander, Jennifer R.; Miller, Bradley D.; Bi, Lian X.; Schuman, Thomas P.; Day, Delbert E.; Bonewald, Lynda F.; Eick, J. D., "Development of a novel biomaterial for orthopaedic applications," 45th Midwest Regional Meeting of the American Chemical Society, Wichita, KS, United States, October 27-30 (2010), MWRM-366.

Zuo, Xiangjun; Damoah, Lucas N. W.; Zhang, Lifeng; Schuman, Thomas; Kers, Jaan, "Green pyrolysis of used printed wiring board powders." In: Recycling of Electronic Waste II. Zhang, Lifeng; Krumdick, Gregory K., Eds. TMS 2011. Proceedings of the Symposium held during the TMS Annual Meeting & Exhibition, 2nd, San Diego, CA, United States, Feb. 27-Mar. 3, 2011 (2011), 17-24

Vuppalapati, R. R.; Menta, V. G. K.; Chandrashekhara, K.; Schuman, T., "Synthesis and performance evaluation of soy-based aliphatic polyurethane nanocomposites for pultrusion," SAMPE 2011, Conference & Exhibition, Long Beach, CA, United States, May 23-26, 2011 (2011), Vuppalapati/11 pp.

Rongpeng Wang, Thomas P. Schuman, "Epoxidized Glycidyl Ester of Soybean Oil as Reactive Diluent for Epoxy Resin," 2nd Annual Excellence in Thermoset Polymer Research Award Competition, Thermoset Resin Formulators Association, June 2011.

Thomas P. Schuman, S. Siddabattuni, "Electron scavenging nature of filler surfaces for high energy density polymer-particle nanocomposites," Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2011), 52(2), 92-93. Abstracts of Papers, 242nd ACS National Meeting & Exposition, Denver, CO, United States, August 28-September 1, 2011 (2011), POLY-586

Thomas P. Schuman, S. Siddabattuni, "Interface controlled high energy density epoxy-barium titanate nanocomposite dielectrics," Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2011), 52(2), 47-48. Abstracts of Papers, 242nd ACS National Meeting & Exposition, Denver, CO, United States, August 28-September 1, 2011 (2011), POLY-669

Thomas P. Schuman, S. Siddabattuni, "Influence of Electronic Nature of Filler Surfaces on Dielectric Properties of Polymer-Particle Nanocomposites," Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2011), 52(2), 45-46. Abstracts of Papers, 242nd ACS National Meeting & Exposition, Denver, CO, United States, August 28-September 1, 2011 (2011), POLY-671

Thomas P. Schuman, Rongpeng Wang, "Epoxidized glycidyl esters of soy/linseed oil: synthesis and thermal properties," Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2011), 52(2), 1048-1049. Abstracts of Papers, 242nd ACS National Meeting & Exposition, Denver, CO, United States, August 28-September 1, 2011 (2011), POLY-345.

Wang, Rongpeng; Schuman, Thomas P., "Structure-property relationships of vegetable oil derived epoxy monomers and thermosetting polymers," Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013, (2013), POLY-563.

Siddabattuni, Sasidhar; Schuman, Thomas P.; Dogan, Fatih, "Hammett correlation for design of polymer-particle dielectric interfaces," Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013, (2013), POLY-499.

Siddabattuni, Sasidhar; Schuman, Thomas P.; Petrovsky, Vladimir; Dogan, Fatih , “Study of nanoceramic-polymer, interfacially coupled nanodielectric composites,” Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013, (2013), PMSE-423.

Chen, Zun; Schuman, Thomas P.; Bai, Baojun , “Preparation of microparticle gels and their application in enhanced oil recovery,” Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013, (2013), PMSE-315.

Wang, Rongpeng; Schuman, Thomas P., “Fabrication and properties of biorenewable epoxy-montmorillonite clay nanocomposites,” Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013, (2013), PMSE-289.

Wang, Rongpeng; Schuman, Thomas P., “Soybean oil derived epoxy/glass fiber composites for structural applications,” Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013, (2013), CELL-272.

Thomas P. Schuman, Rongpeng Wang, “High Performance Biobased Epoxy Resin,” ACS MWRM, Springfield, MO, 17 October 2013.

Ranaweera, R. A. A. Upul; Subramani, S.; Jentsch, Nicholas; Schuman, Thomas P., “Asymmetric synthesis of the 3-TOSU monomer,” Abstracts of Papers, 246th ACS National Meeting & Exposition, Indianapolis, IN, United States, September 8-12, 2013 (2013), ORGN-497.

Ranaweera, R. A. A. Upul; Jentsch, Nicholas; Schuman, Thomas P., “Synthesis and use of epoxy phosphonate ester as a coupling agent for metal oxide interfaces,” Abstracts of Papers, 246th ACS National Meeting & Exposition, Indianapolis, IN, United States, September 8-12, 2013 (2013), COLL-215.

## Grants

<i>Funding Agency, Shared credit</i>	<i>History</i>
Hewlett Packard Corporation, Academic Partnership grant, paper coatings (ink jet) (50%); co-PI: James O. Stoffer (50%)	Aug 1999-02 \$329,300/3yr
Defense Advanced Research Projects Agency, Conductive polymer composites (40%); co-PI: Matthew O’Keefe (60%)	July 2000-03 \$365,000/3 yr
Universal Technology Corporation Non-chromated Aerospace Coatings for Military Aircraft (12%); co-PIs: James O. Stoffer (27%), Thomas O’Keefe (27%), Matthew O’Keefe (12%), William Fahrenholtz (12%), Paul Yu (10%)	Sept 2001 – 02 \$1,120,800
Caterpillar, Conductive polymers for corrosion inhibition of steel (50%); co-PI: James O. Stoffer (50%)	July 2000-2002 \$110,000/2 yr
Missouri Soybean Council, Heterogenous catalysts for partial oxidation of plant oils (100%)	July 2001 \$20,000
Hewlett Packard Corporation, Ink Jet Media division, Paper coatings for ink-jet (50%); co-PI: James O. Stoffer (50%)	Nov 2002-03 \$107,700
Stanford Synchrotron Research Lab (SSRL), XANES and EXAFS Study of the Cerium Valence State in Several Cerium Based Corrosion Inhibitors (80%), co-PI: Gary Long	April 2002 Beamtime
United States Air Force, Research Laboratory Materials and Manufacturing Directorate Environmentally benign anticorrosion chemistries for the protection of aluminum alloys	Sept 2002-05

(5%); co-PIs: James O. Stoffer (41%), Thomas O'Keefe (41%), Matthew O'Keefe (5%), William Fahrenholtz (5%), Paul Yu (3%)	\$1,775,094
Center for Dielectric Studies, Organic-ceramic dielectric composites (50%); co-PIs: Fatih Dogan (25%), Mike Krogh (25%)	May 2003 \$20,875/yr
Hewlett Packard Corporation, Ink Jet Media division, Paper coatings for ink-jet (50%); co-PI: James O. Stoffer (50%)	Nov 2003-04 \$119,600
Center for Dielectric Studies, Organic-ceramic dielectric composites (50%); co-PIs: Fatih Dogan (25%), Mike Krogh (25%)	May 2003 \$20,875/yr
U.S. Department of Education, GAANN Fellowship Program for Graduate Education in Interdisciplinary in Materials Engineering (5%); co-PIs: Robert Schwartz (30%), Richard Brow (10%), James Drewniak (10%), Fatih Dogan (10%), Gregory Hilmas (10%), Mary Reidmeyer (10%), William Fahrenholtz (5%), Matthew O'Keefe (5%), Harlan Anderson (5%)	Aug 2004-07 \$703,008
Hewlett Packard Corporation, Ink Jet Media division, Paper coatings for ink-jet (100%)	Nov 2004-05 \$18,500
Center for Dielectric Studies, Organic-ceramic dielectric composites (50%); co-PIs: Fatih Dogan (25%), Mike Krogh (25%)	May 2004 \$13,875/yr
Metal Container Corporation, div. of Anheuser-Busch, Corrosion assessment of aluminum can surface pretreatment (100%)	May 2005 \$6,000
Center for Dielectric Studies, Organic-ceramic dielectric composites (50%); co-PIs: Fatih Dogan (25%), Mike Krogh (25%)	May 2005 \$7,875/yr
United Soybean Board, Pultruded Soybean Composites (50%); PI K. Chandrashekhara	October 2007 \$50,000/year
National University Transportation Center, Pultruded Composites Using Soy-based Polyurethane (50%); PI K. Chandrashekhara	November 2007 \$25,000/yr
Gen Dynamics Ordinance& Tactical Systems/NUTC, Development of Glass Fiber Reinforced Transparent Composites (Chandrashekhara (PI), Schuman (co-PI) (50%))	10/1/2008 - 9/30/2009 \$ 50,000
MSC Corporation, Development of Fatty Prill Processes (100%)	June 2007-June 2009 \$10,000
Missouri Life Science Research Board 13234, Bone Cement for Fracture Repair in Animals (Eick, Bonewald (PI's); role co-PI (5%))	1 Jan 2008-31 Dec 2010
NSF I/UCR Center, Synthesis and Development Of High Energy Density Dielectric Composites (Schuman (PI, 55%), Dogan (co-PI, 45%))	8/14/2001 - 7/31/2010 \$ 150,000
MSC Company, Development of Novel Animal Feed (Mormile (PI), Lamb, Schuman, Sitton (co-PI's) (40:0:30:30))	12/1/2006 - 6/30/2009 \$ 472,575
United Soybean Board, Pultruded Soybean Composites (50%); PI K. Chandrashekhara	October 2009-2011 \$50,000/year
National Institutes of Health, Nanostructured Dental Composite (J. David Eick (PI), K. Kilway, T. Schuman, M. Velez (co-PIs))	4/1/2007 - 3/31/2011 \$ 1,012,500
Polyhalon (T. Schuman, PI)	Oct 2009 – Oct 2010 \$2500



U.S. Office of Naval Research, Enhanced Dielectric Breakdown Strength and Permittivity Composites	Feb 2011 – Jul 2013	
T. Schuman (PI), F. Dogan (25%)		\$200,000
Telemedicine and Advanced Technology Research Center (TATRC)	Aug 2011 – Jul 2015	
J. D. Eick (PI), L. Bonewald, K. Kilway, T. Schuman (co-PIs)		\$1,049,000
SBIR Lightweight Fiber Reinforced Transparent Composites For Armored Ground/Sea Vehicles (HABsonic)		\$25,000
K. Chandrashekhara (PI), T. Schuman (50%)	May 13 to Nov 13	
Enhanced Oil Recovery JIP (Industrial Consortium)		\$85,000
Baojun Bai (PI), T. Schuman (40%)	Oct 2014 – Oct 2016	
Scale Up of Dielectric Films for High Energy Storage Density Capacitors (General Atomics subcontract funded by Office of Naval Research)		\$472,900
T. Schuman (PI), F. Dogan (25%)	May 2016 to Aug 2017	
Oil-Derived, Epoxy Monomer for Structural Composite Applications (Missouri Soybean Board)		\$39,483
T. Schuman (PI)	June 2016 to May 2017	
Enhanced Oil Recovery JIP (Industrial Consortium)		\$85,000
Baojun Bai (PI), T. Schuman (co-PI, 100%)	Oct 2016 – Oct 2017	
Enhanced Oil Recovery JIP - High Temp PPGs (Industrial Consortium)		\$85,000
Baojun Bai (co-PI), T. Schuman (PI, 100%)	Oct 2017 – Oct 2018	
Enhanced Oil Recovery JIP - High Temp PPGs (Industrial Consortium)		\$85,000
Baojun Bai (co-PI), T. Schuman (PI, 100%)	Oct 2018 – Oct 2019	
Enhanced Oil Recovery JIP - High Temp PPGs (Industrial Consortium)		\$85,000
Baojun Bai (co-PI), T. Schuman (PI, 100%)	Oct 2019 – Oct 2020	
SBIR: Soy-Based _Structural Insulated Panels for Energy Efficient Housing		\$25,000
K. Chandrashekhara (PI), P. Nam (co-PI), T. Schuman (co-PI)	Aug 2019 – April 2020	
Enhanced Oil Recovery JIP - High Temp PPGs (Industrial Consortium)		\$85,000
Baojun Bai (co-PI), T. Schuman (PI, 100%)	Oct 2020 – Oct 2021	
SERDP, Application of Schiff Base Chemistry to Surface Passivation and Sealing of Plated Steels, Anodized Aluminum and IVD Coatings (as subcontract under Boeing, \$1,704,830)		\$600,000
W. Schuette (Boeing, PI), W. Fahrenholtz (PI), T. Schuman (co-PI), M. O’Keefe (co-PI)	May 2021 – Apr 2024	
PGCCIC: Research Project: Development of High Temperature Resistant Gels for Conformance Control (Industrial Consortium) Project 00065259		\$137,326
Baojun Bai (co-PI 20%), T. Schuman (PI, 80%)	Oct 2021 – Oct 2022	
PGCCIC: Research Project: Further Improvement of CO2 Resistant Re-crosslinked Particle Gels for Conformance Control (Industrial Consortium) Project 00065262		\$ 308,575
Baojun Bai (PI 80%), T. Schuman (co-PI, 20%)	Oct 2021 – Oct 2022	
Cost-effective swellable particle gel-sealants for geothermal energy reservoirs (U.S. Department of Energy)		2,291,240.00 direct+ \$300,000 match
B. Bai (PI, 40%), T. Schuman (co-PI, 30%), Minzhen Wu (co-PI, 30%)	May 2021-May 2024	
Polymer Composites (Honeywell)		\$145,000
K. Chandeshakhara (PI) 40%, R. Billo (20%), M. Liu (20%) and T. Schuman (20%)		

1 October 2022-30 Sept 2023