Dr. Pengfei Cao

Staff Scientist
Chemical Sciences Division
Oak Ridge National Laboratory
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Position

- **Staff Scientist**
  Soft Materials Group, Chemical Sciences Division, Oak Ridge National Lab 2019 -

- **Postdoctoral Research Associate**
  Soft Materials Group, Chemical Sciences Division, Oak Ridge National Lab 2016 - 2018

Education

- **Ph.D.** of Macromolecular Science and Engineering,
  Department of Macromolecular Science and Engineering,
  Case Western Reserve University, Cleveland, USA Dec. 2015
- **M.S.** of Polymer Chemistry and Physics,
  Department of Chemistry, Tianjin University, Tianjin, China, Jul. 2010
- **B.E.** of Applied Chemistry
  Department of Chemistry, Tianjin University, Tianjin, China, Jul. 2008

Research Expertise

Dr. Pengfei Cao is a polymer chemist with expert in the design and synthesis of polymeric materials with controlled architectures and defined properties for both fundamental studies and application investigation. His current research interest mainly focused on two directions: 1) high performance elastomer, like self-healing, adhesive elastomers and recyclable elastomers; 2) synthetic polymeric material for battery applications, like polymer binder, polymer electrolyte and polymeric protection layer. He leads or technically leads several DOE projects on synthetic polymeric materials for energy-related applications. Till now, he published 59 peer-reviewed journal publications (36 as corresponding and 1st author) and 2 two book chapters.

Mentoring Experience

Research Mentor:

Postdocs: Dr. Zhen Zhang, *Dec. 2019 till now*, PhD University of New Mexico, Postdoc University of Chicago;

Dr. Jiadeng Zhu, *Mar. 2020 till now*, PhD NC State University, Postdoc University of Virginia;

Dr. Jiancheng Luo, *July. 2020 till now*, PhD University of Akron;

Dr. Zoriana Dumchuk, *Nov. 2020 till now*, PhD North Dakota State University.

PhD students: Bingrui Li (as co-mentor), *Sep. 2018 till now*, Bredesen Center & University of Tennessee

Sheng Zhao (as co-mentor), *Jan. 2018 till now*, University of Tennessee

Peer Reviewer Experience

Advanced Materials, Physical Review Letters, Advanced Functional Materials, Energy Storage Materials, Small, Macromolecules, ACS Applied Material and Interface, Chemistry-A European Journal, Polymer Reviews, Polymer Chemistry,

Funded Grants

Enabling Cross-industry reuse of comingled waste plastics as quality asphalt modifier for sustainable pavement, role: Lead PI in National Lab side, S 1,000,000, *2022-2024.*

3D Printed Hybrid Composite Materials with Sensing Capability for Advanced Vehicles, role: Task Lead, DOE-VTO, AOP Lab Call, $ 1,500,000, *2021-2024*.

Primer-less, Self-healing Sealant for Building Envelopes, role: Technical Leading, DOE-TCF (Technology Commercialization Fund), $200,000, *2021-2023*.

Preinstalled Sealant for Prefab Components, role: Technical Leading, Funding Opportunities Announcement (FOA), Building Technology Office (BTO), DOE, DE-FOA-0002099, $1,000,000, *2020-2023*.

Surpassing Stiffness-Extensibility Trade-off in Elastomers, role: Leading PI, Director's R&D Fund, Project ID: 9899, $756,000, *2019-2021*.

Primer-Less Self-Healing Sealants for Building Envelopes, role: Technically Leading, DOE Lab Open Call, $250,000 for 2018-2019; $ 20,000 for 2019-2020, $19,000 for 2020-2021.

Controlling Reversibility in Next-generation Upcycling Polymers, role: co-PI, Director's R&D Fund, Project ID: 9899, $1,500,000, 2019-2021.

High-Energy Density Hybrid and All-Solid-State Batteries and Manufacturing, role: co-PI, Director's R&D Fund, Project ID: 9798, $1,800,000, 2019-2021.

Deconstruction of plastics into useful fuels using single atom catalysts, role: co-PI, Seed Fund, Project ID: 9940, $ 190,000, 2019-2020

Self-healing barrier films for vacuum insulation panels, role: co-PI, Seed Fund, Project ID: 8520. ORNL SEED. $190,000, 2017-2018.

Self-healing films to improve durability of vacuum insulation panels by in-situ remediation of film defects, role; Co-PI, Lab Open Call, $500,000 for FY2019; $ 300,000 for 2019-2020

Journal Publications (59 in total, 36 as 1st /corresponding author)

1. Weiguang Chen, Hai-Jie Wei, Jiancheng Luo, Yu Chen,* and **Peng-Fei Cao,*** Highly Stretchable, Ultra-Tough and Multifunctional Poly(Vinyl Chloride) based Plastics via a Green, Star-Shaped Macromolecular Additive, ***Macromolecules***,

Accepted.

2. Bingrui Li, Sheng Zhao, Jiadeng Zhu, Sirui Ge, Kunyue Xing, Alexei Sokolov, Tomonori Saito, **Peng-Fei Cao,*** Rational Polymer Design of Stretchable Poly(ionic liquid)s Membranes for Dual Applications, ***Macromolecules (Journal Front Cover)***, **2021, 54, 2, 896–905**
3. Jiadeng Zhu, Zhen Zhang, Sheng Zhao, Andrew S. Westover,* Ilias Belharouak, and **Peng-Fei Cao,*** Single-Ion Conducting Polymer Electrolytes for Solid-State Lithium Metal Batteries: Design, Performance, and Challenges, ***Advanced Energy Materials***, **Accepted.**
4. Martin Tress,* Sirui Ge, Kunyue Xing, **Peng-Fei Cao**, Tomonori Saito, Anne-Caroline Genix and Alexei Sokolov,* Turning Rubber into a Glass: Mechanical Reinforcement by Micro-Phase Separation, ***ACS Macro Lett***. **2021, 10, XXX, 197–202**
5. Xiang Cheng, Li-Han Rong, **Peng-Fei Cao,*** and Rigoberto Advincula,* Core-Shell Gold Nanoparticle-Star Copolymer Composite with Gradient Transfer and Transport Properties: Toward Electro-Optical Sensors and Catalysis, ***ACS Applied Nano Materials***, **2021**, **In Press.**
6. Zhen Zhang, Natasha Ghezawi, Bingrui Li, Sirui Ge, Sheng Zhao, Tomonori Saito,* Diana Hun,* and **Peng-Fei Cao*** Autonomous Self-healing Elastomers with Unprecedented Adhesion Force, ***Advanced Functional Materials***, **2021, 31 (4), 2006298.**
7. Guang Yang, Michelle L. Lehmannad, Sheng Zhao, BingruiLi, Sirui Ge, **Peng-Fei Cao**, Frank M. Delnick, Alexei P. Sokolov, Tomonori Saito, Jagjit Nanda, Anomalously high elastic modulus of a poly(ethylene oxide)-based composite electrolyte, ***Energy Storage Materials***, **2021**, 35, 431-442.
8. Sheng Zhao, Yiman Zhang, Hoang Pham, Jan-Michael Y. Carrillo, Bobby G. Sumpter, Jagjit Nanda, Nancy J. Dudney, Tomonori Saito, Alexei P. Sokolov*, and **Peng-Fei Cao*,** Improved Single-ion Conductivity of Polymer Electrolyte via Accelerated Segmental Dynamics, ***ACS Applied Energy Materials***, **2020**, 3, 12, 12540–12548.
9. Qiyi Chen, Han Lu, Jingbo Ren, Lihan Rong, **Peng-Fei Cao**, and Rigoberto Advincula, 4D Printing via an Unconventional Fused Deposition Modeling route to High-Performance Thermoset, ***ACS Appl. Mater. Interfaces,*** **2020**, 12, 44, 50052–50060.
10. Shilun Gao, Feiyuan Sun, Nian Liu, Huabin Yang,* and **Peng-Fei Cao,*** Ionic conductive polymers as artificial solid electrolyte interphase films in Li metal batteries – A review, ***Materials Today***, **2020**, 40, 140-159.
11. Lu Han*, Michelle L. Lehmann, Jiadeng Zhu1, Tianyi Liu, Zhengping Zhou, Xiaomin Tang, Chien-Te Heish, Alexei P. Sokolov, **Pengfei Cao**, Xi Chelsea Chen and Tomonori Saito,* Recent Developments and Challenges in Hybrid Solid Electrolytes for Lithium-Ion Batteries, ***Frontiers in Energy Research***, In Press. 02 September 2020
12. **Peng-Fei Cao,*** Bingrui Li, Guang Yang, Sheng Zhao, Jacob Townsend, Kunyue Xing, Zhe Qiang, Konstantinos D. Vogiatzis, Alexei P. Sokolov, Jagjit Nanda, and Tomonori Saito* Elastic Single-ion Conducting Polymer Electrolytes: Towards a Versatile Approach for Intrinsically Stretchable Functional Polymers**,** ***Macromolecules*****,** **2020**, 53, 9, 3591–3601.
13. Shilun Gao, Feiyuan Sun, Alexander Brady, Yiyang Pan, Andrew Erwin, Dandan Yang, Vladimir Tsukruk, Andrew G Stack, Tomonori Saito, Huabin Yang,* and **Peng-Fei Cao,*** Ultra-efficient polymer binder for silicon anode in high-capacity lithium-ion batteries, ***Nano Energy***, **2020**, 73, 104804
14. Yiyang Pan, Sirui Ge, Zahid Rashid, Shilun Gao, Andrew J Erwin, Vladimir V Tsukruk, Konstantinos D Vogiatzis, Alexei P Sokolov, Huabin Yang,* **Peng-Fei Cao,*** Adhesive Polymers as Efficient Binders for High-Capacity Silicon Electrodes, ***ACS Applied Energy Materials*****, 2020**, 3, 4, 3387–3396
15. Sirui Ge, Martin Tress, Kunyue Xing, **Pengfei Cao,** Tomonori Saito, and Alexei Sokolov,* Viscoelasticity in associating oligomers and Q2 polymers: experimental test of the bond lifetime renormalization model. ***Soft. Matter.*** **2020**, 16, 2, 390-401.
16. Liyuan Geng, Dandan Yang, Shilun Gao, Zhaoxiang Zhang, Feiyuan Sun, Yiyang Pan, Shaoqi Li, Xiaohua Li, **Peng-Fei Cao,* and** Huabin Yang* Facile Fabrication of Porous Si Microspheres from Low-Cost Precursors for High-Capacity

Electrode, ***Advanced Material & Interfaces***, **2020**, 7(3), 1901726.

2019

17. **Peng-Fei Cao,*** Guang Yang, Bingrui Li, Yiman Zhang, Sheng Zhao, Shuo Zhang, Andrew Erwin, Zhengcheng Zhang, Alexei P. Sokolov, Jagjit Nanda,* and Tomonori Saito,* Rational Design of Multifunctional Binder for High-Capacity Silicon Based Anodes, ***ACS Energy Letter***, **2019**, 4, 1171-1180 (**DOE-EERE Highlights**).
18. Tao Hong, **Peng-Fei Cao,*** Sheng Zhao, Bingrui Li, Connor Smith, Michelle Lehmann, Andrew J. Erwin, Shannon M. Mahurin, Surendar R. Venna, Alexei P. Sokolov, and Tomonori Saito,* Tailored CO2-philic Gas Separation Membranes *via* One-Pot Thiol-ene Chemistry, ***Macromolecules***, **2019**, 52, 15, 5819-5828.
19. Martin Tress,* Kunyue Xing, Sirui Ge, **Pengfei Cao**, Tomonori Saito, and Alexei Sokolov, What dielectric spectroscopy can tell us about supramolecular networks, ***The European Physical Journal E***, **2019**, 42,10,133.
20. Yiyang Pan, Shilun Gao, Feiyuan Sun, Huabin Yang,* and **Peng-Fei Cao*** Polymer Binders Constructed through Dynamic Noncovalent Bonds for High-Capacity Silicon-Based Anodes, ***Chemistry-A European Journal***, **2019**, 25, 47, 10976-10994.
21. Qiyi Chen, Jiayu Zhao, Jingbo Ren, Lihan Rong, **Peng-Fei Cao**, Rigoberto C Advincula,* 3D Printed Multifunctional, Hyperelastic Silicone Rubber Foam, ***Advanced Functional Materials***. **2019**, 29, 23, 1900469.
22. Shilun Gao, Dandan Yang, Yiyang Pan, Liyuan Geng, Shaoqi Li, Xiaohua Li, **Peng-Fei Cao,*** Huabin Yang,* From natural material to high-performance silicon based anode: Towards cost-efficient silicon based electrodes in high-performance Li-Ion batteries, ***Electrochimica Acta***, **2019**, 135058
23. Kaushik Biswas,* Dustin Gilmer, Natasha Ghezawi, **Pengfei Cao**, Tomonori Saito,* Demonstration of self-healing barrier films for vacuum insulation panels, ***Vacuum***, **2019**, 164, 132-139.
24. Yun-Hui Yan, Li-Han Rong, Jin Ge, Brylee David B Tiu, **Peng-Fei Cao**, Rigoberto C Advincula,* Mussel-Inspired Hydrogel Composite with Multi‐Stimuli Responsive Behavior, ***Macromolecular Materials and Engineering***, **2019**, 1800720.
25. Guang Yang, Robert L. Sacci, Ilia N. Ivanov, Rose Ruther, Kevin Hays, Yiman Zhang, **Peng-Fei Cao,** Gabriel M. Veith, Nancy J. Dudney, Tomonori Saito, Daniel T. Hallinan, and Jagjit Nanda, Probing Electrolyte Solvents at Solid/Liquid Interface Using Gap-Mode Surface-Enhanced Roman Spectroscopy, ***Journal of The Electrochemical Society*****, 2019,** 166(2) A1-A10.

2018

26. **Peng-Fei Cao,*** Bingrui Li, Tao Hong, Jacob Townsend, Zhe Qiang, Kunyue Xing, Konstantinos D. Vogiatzis,b Yangyang Wang, Alexei P. Sokolov, and Tomonori Saito.* Super-Stretchable, Self-Healing Polymeric Elastomers with Tunable Properties. ***Advanced Functional Materials***. **2018**, 1800741**.** (ORNL highlight, DOE highlight)
27. Kunyue Xing, Martin Tress, **Peng-Fei Cao**,* Fei Fan, Shiwang Cheng, Tomonori Saito, and Alexei Sokolov.* The role of chain-end association life time in segmental and chain dynamics of telechelic polymers. ***Macromolecules***, **2018**, 51, 8561-8573.
28. Piaoran Ye, **Peng-Fei Cao,*** Qiyi Chen, and Rigoberto Advincula.* Continuous Flow Fabrication of Block Copolymer Grafted Silica Micro-particles in Environmentally Friendly Water/Ethanol Media, ***Macromolecular Materials and Engineering*****. 2018,** 1800451.
29. **Peng-Fei Cao,*** Michael Naguib, Zhijia Du, Eric Stacy, Bingrui Li, Tao Hong, Kunyue Xing, Dmitry N. Voylov, Jianlin Li, David L. Wood, III, Alexei P. Sokolov, Jagjit Nanda, and Tomonori Saito,* Effect of Binder Architecture on the Performance of Silicon/Graphite Composite Anodes for Lithium Ion Batteries, ***ACS Appl. Mater. Interfaces,*** **2018**, 10, 3470−3478.
30. Kunyue Xing, Martin Tress, **Pengfei Cao,*** Shiwang Cheng, Tomonori Saito, Vladimir N. Novikov, and Alexei P. Sokolov,*

Hydrogen-bond strength changes network dynamics in associating telechelic PDMS, ***Soft Matter***, **2018**, 14, 1235-124.

31. **Peng-Fei Cao**, Al de Leon, Lihan Rong, Ke-Zhen Yin, Eric C. Abenojar, Zhe Su, Brylee Tiu, Agata A. Exner, Eric Baer, Rigoberto C. Advincula* Polymer Nanosheet Containing Star-like Copolymers: a Novel Scalable Controlled Release System, ***Small***, **2018,** 14, 1800115**.**
32. Ana Sousa-Castillo, Leonardo N. Furini, Brylee David B. Tiu, **Peng-Fei Cao**, Begum Topcu, Miguel Comesana-Hermo, Benito Rodriguez-Gonzalez, Walid Baaziz, Ovidiu Ersen, Rigoberto Advincula,* Moises Perez-Lorenzo,* and Miguel A. Correa-Duarte.* Plasmonic Retrofitting of Membrane Materials: Shifting from Self-Regulation to On-Command Control of Fluid Flow, ***Advanced Materials***, **2018**, 1707598.
33. Qiyi Chen, **Pengfei Cao,** and Rigoberto C. Advincula.* Mechanically Robust, Ultra-Elastic Hierarchical Foam with Tunable Properties via 3D Printing, ***Advanced Functional Materials***, **2018,** 28, 1800631.
34. Tao Hong, Sophia Lai, Shannon M. Mahurin, **Peng-Fei Cao**, Dmitry N. Voylov, Harry M. Meyer III, Christopher B. Jocobs, Jan-Michael Y. Carrillo, Alexander Kisliuk, Illia N. Ivanov, De-en Jiang, Brian K. Long, Jimmy W. Mays, Alexei Sokolov, Tomonori Saito* Highly Permeable Oligo(ethylene oxide)-co-poly(dimethylsiloxane) Membranes for Carbon Dioxide Separation, ***Advanced Sustainable Systems***. **2018,** 2, 1700113.
35. Kevin A. Haysa, Rose E. Ruthera, Alexander J. Kukaya, **Pengfei Cao,** Tomonori Saito, David L. Wood III, Jianlin Li.* What makes lithium substituted polyacrylic acid a better binder than polyacrylic acid for silicon-graphite composite anodes? ***Journal of Power Sources***, **2018**, 384, 136-144.

2017

36. **Peng-Fei Cao**,* Bingrui Li, Tao Hong, Kunyue Xing, Dmitry Voylov, Shiwang Cheng, Panchao Yin, Alexander Kisliuk, Shannon Mahurin, Alexei Sokolov, Tomonori Saito.* A Robust and Elastic Polymer Membrane with Tunable Properties for Gas Separation. ***ACS Applied Material & Interfaces***, **2017,** 9(31), 26483-26491.
37. Vera Bocharova,* Zaneta Wojnarowska, **Peng-Fei Cao,*** Yao Fu, Rajeev Kumar, Bingrui Li, Vladimir N Novikov, Sheng Zhao, Alexander M Kisliuk, Tomonori Saito, Jimmy W Mays, Bobby G Sumpter, Alexei P Sokolov*, Influence of Chain Rigidity and Dielectric Constant on the Glass Transition Temperature in Polymerized Ionic Liquids, ***The Journal of Physical Chemistry B***, **2017,** 121 (51), 11511–11519.
38. **Peng-Fei Cao,** Li-Han Rong, Joey Dacula Mangadlao, and Rigoberto Advincula.* Synthesizing a Trefoil Knotted Block Copolymer via Ring-expansion Strategy. ***Macromolecules*****, 2017**, 50(4), 1473-1481.
39. **Peng-Fei Cao,*** Zaneta Wojnarowsk, Tao Hong, Bobby Carroll, Bingrui Li, Hongbo Feng, Leo Parsons, Weiyu Wang, Bradley S. Lokitz, Shiwang Cheng, Vera Bocharova, Alexei P. Sokolov, and Tomonori Saito* A star-shaped single lithium-ion conducting copolymer by grafting a POSS nanoparticle, ***Polymer,*** **2017,** 124(25), 117-127.
40. Pianran Ye, **Peng-Fei Cao,*** Zhe Su, Rigoberto Advincula,* Highly efficient reversible addition-fragmentation chain-transfer polymerization in ethanol/water *via* flow chemistry. ***Polymer International***, **2017,** 66(9), 1252-1258.
41. Joey Mangadlao, **Pengfei Cao,** Diana Choi, and Rigoberto C. Advincula.* Photoreduction of Graphene Oxide and Photochemical Synthesis of Graphene–Metal Nanoparticle Hybrids by Ketyl Radicals. ***ACS Applied Material & Interfaces***, **2017**, 9(29), 24887-24898.
42. Shiwang Cheng,* Shi-Jie Xie, Jan-Micheal Y. Carrilo, Bobby Carroll, Halie Martin, **Peng-Fei Cao,** Mark D. Dadmun, Bobby G. Sumpter, Vladimir N. Novikov, Kenneth S. Schweizer, and Alexei P. Sokolov.* Big Effect of Small Nanoparticles: A Shift in Paradigm for Polymer Nanocomposites. **ACS Nano**, **2017**, 11(1), 752-759.

Before 2016

43. **Peng-Fei Cao**, Joey Mangadlao, and Rigoberto Advincula.* Trefoil Knotted Polymer Produced through Ring-expansion.

Angewandte Chemie International Edition, **2015**, 54, 5127-5131.

44. **Peng-Fei Cao,** Yun-Hui Yan, Joey Mangadlao, Li-Han Rong, and Rigoberto Advincula.* Star-like Copolymers Stabilized Noble-Metal Nanoparticle Powders. ***Nanoscale***, **2016,** 8, 7435-7442. *(cover page story).*
45. Amy M Wen, Karin L. Lee, **Peng-Fei Cao**, Katrina Pangilinan, Bradley L. Carpenter, Patricia Lam, Frank Veliz, Reza A. Ghiladi, Rigoberto C Advincula, and Nicole F Steinmetz.* Utilizing Viral Nanoparticle/Dendron Hybrid Conjugates in Photodynamic Therapy for Drug Delivery to Macrophages and Cancer Cells. ***Bioconjugate Chem***. **2016**, 27(5) 1227-1235.
46. **Peng-Fei Cao,** Li-Han Rong, Al de Leon, Zhe Su, and Rigoberto Advincula.* A Supramolecular Polyethylenimine-cored Carbazole Dendritic Polymer with Dual Applications. ***Macromolecules***, **2015**, 48, 6801-6909.
47. **Peng-Fei Cao,** Zhe Su, Al de Leon, and Rigoberto Advincula.* Photoswitchable Nanocarrier with Reversible Encapsulation Properties. ***ACS Macro Letter***, **2015**, 4, 58-62.
48. **Pengfei Cao**, Joey Mangadlao, and Rigoberto Advincula.* Stimuli-Responsive Polymers and their Potential Applications in Oil-Gas Industry. ***Polymer Reviews*，2015***, 55,* 706-733.
49. **Peng-Fei Cao**, Joey Dacula Mangadlao, Al de Leon, Zhe Su, and Rigoberto Advincula.* Catenated Poly(ε-caprolactone) and Poly(L-lactide) *via* Ring-expansion Strategy. ***Macromolecules***, **2015**, 48, 3825-3833. (Top 5 Most Read Articles in June 2015 of *Macromolecules; Featured in Synfacts*)
50. Ajaykumar Bunha, **Peng-Fei Cao**, Joey Mangadlao, Feimo Shi, Edward Foster, Katrina Pangilian and Rigoberto Advincula.* Polymeric catenanes synthesized *via* "click" chemistry and atom transfer radical coupling, ***Chemical Communication***, **2015**, 51, 7528-7531.
51. Joey Mangadlao, Al de Leon, Mary Jane Felipe, **Peng-Fei Cao**, Paul Advincula and Rigoberto C. Advincula.* Grafted Carbazole-Assisted Electrodeposition of Graphene Oxide. ***ACS Applied Material & Interfaces,*** **2015***,* 7, 10266-10274.
52. Joey Mangadlao, **Pengfei Cao**, Rigoberto Advincula.* Smart Cements and cement additives for oil gas operations. ***Journal of Petroleum Science and Engineering***, **2015**, 129, 63-76.
53. Ajaykumar Bunha, **Peng-Fei Cao**, Joey Mangadlao and Rigoberto Advincula.* Cyclic poly(vinylcarbazole) *via* ring-expansion polymerization RAFT (REP-RAFT). ***Reactive and Functional polymers,*** **2014**, 80, 33-39.
54. **Peng-Fei Cao**, Mary Jane Felipe and Rigoberto C. Advincula.* On the Formation and Electropolymerization of a Star Copolymer with Peripheral Carbazoles. ***Macromolecular Chemistry and Physics,*** **2013**, 214, 386-395.
55. **Peng-Fei Cao**, Ajaykumar Bunha, Joey Mangadlao, Mary Jane Felipe, Katrina Irene Mongcopa and Rigoberto Advincula.* Supramolecularly Templated Catenane Initiator and a Controlled Ring Expansion Strategy. ***Chemical Communication***, **2012**, 48, 12094-12096.
56. **Peng-Fei Cao**, Rong-Xu Zhao, Lin Li, Wen-Wen Yang, Fa Cheng, Yu Chen,* Cong-Hua Lu, Shi-Chun Jiang.* Covalently stabilizied vesicles derived from amphiphilic multiarm star polymers: Preparation, characterization, and their capability of hosting different polarity of guests. ***Journal of Polymer Science, Part A: Polymer Chemistry***, **2012**, *50,* 227-236.
57. **Peng-Fei Cao**, Rui Xiang, Xun-Yong Liu, Chun-Xiao Zhang, Fa Cheng, Yu Chen.* Modulating the Guest Encapsulation and Release Properties of Multi-Arm Star Polyethylenimine-*block*-Poly (ε-caprolactone). ***Journal of Polymer Science, Part A: Ploymer Chemistry,*** **2009**, 47, 5184-5193.
58. Xing-Long Lou, Fa Cheng, **Peng-Fei Cao**, Qiang Tang, Hua-ji Liu, Yu Chen.* Self-assembled Supramolecular Nanocarrier Hosting Two Kinds of Guests in Site-Isolation State. ***Chemistry-A European Journal,*** **2009**, 15, 11566-11572.
59. Xulong Cao, Zhenquan Li, Xinwang Song, Xiaohong Cui, **Pengfei Cao,** Huaji Liu, Fa Cheng, Yu Chen*. Core-shell type multiarm star poly (ε-caprolactone) with high molecular weight hyperbranched polyethylenimine as core: Synthesis, characterization and encapsulation properties. ***European Polymer Journal*****, 2008**, 44, 1060-1070.

Book Chapters

1. **Peng-Fei Cao**, Edward Foster, Al de Leon, Rigoberto Advincula.* Living Radical Polymerization from Colloidally-templated Nanopatterned Surfaces. ***Controlled Radical Polymerization: Materials.*** January 1, 2015, 169-185.
2. Al Leon, Brylee Tiu, Joey Mangadlao, Katrina Pangilinan, **Pengfei Cao** and Rigoberto Advincula. Application of Fourier Transform Infrared Imaging. ***Handbook of spectroscopy: Second, Enlarged Edition***.

Patent Application

Kaushik Biswas, David Lee Wood III, Kelsey M Grady, Natasha B Ghezawi, **Pengfei Cao**, Tomonori Saito, Roll-to-roll slot die coating method to create interleaving multi-layered films with chemical slurry coatings, US20200391495A1

Tomonori Saito, **Pengfei Cao**, Jagjit Nanda, Micheal Naguid Adelmalak, Block Graft Copolymer Binders and their use in silicon-containing anodes of lithium-ion batteries. Pub. No.: US 2019/0229337 A1

Kaushik Biswas, **Pengfei Cao**, Tomonori Saito, Self-Healing Barrier Films for Vacuum Insulation Panels, US20200232594A1

Rigoberto Advincula, Eric Baer, **Pengfei Cao,** Polymer Constructs for Controlled Release of Guest Agents, US Patent App. 16/482,157

Tomonori Saito, **Pengfei Cao,** Super-stretchable self-healing polymer, US Patent App. 16/407,873

Tomonori Saito, **Pengfei Cao**, Jagjit Nanda, Crosslinked functional binders and their use in silicon-containing anodes of lithium-ion batteries, US Patent App. 16/032,207, 2019