CURRICULUM VITAE

Name Shi-Qing Wang

Education

1987, Ph.D. (Physics), University of Chicago
1982, B.S. (Physics), Wuhan University, China
1981, Competing in and admitted to the CUSPEA† (the China-U.S. Physics Examination and Application) Program

Academic Experiences

December 2011 – present: Kumho Professor, University of Akron
September 2000 – November 2011: Professor, Department of Polymer Science, University of Akron
July 1998 – August 2000: Professor, Department of Macromolecular Science and Engineering, Case Western Reserve University
July 1995 – June 1998: Associate Professor, Dept. of Macromol. Sci. and Engr., CWRU
October 1989 – June 1995: Assistant Professor, Dept. of Macromol. Sci. and Engr., CWRU
1987 – 1989, Postdoctoral Associate, University of California at LA
1983 – 1984, Teaching Assistant, University of Chicago
1982 – 1983, Teaching Assistant, University of Rochester

Research Interests

Physics and engineering of polymeric and other structured materials: Experimental and theoretical foundations of polymer rheology and processing: phenomenology of linear and nonlinear viscoelastic processes; flow instabilities and processing phenomena including wall slip and melt fracture. Molecular foundation for fracture mechanics of polymer glasses.

Professional Associations

APS Fellow (1997)
AAAS Fellow (2014)

Publications

Monograph:
Nonlinear Polymer Rheology: macroscopic phenomenology and molecular foundation, Shi-Qing Wang (Wiley, 2018).

† China-US Physics Examination and Application Program that annually selected the top 100 physics majors in China in the period of 1979-1989 and brought them to the top 60 physics departments in the United States for doctoral studies in Physics. Nobel laureate in Physics (1957), T. D. Lee created CUSPEA.

Book Chapter:
"Experiments-inspired molecular modeling of yielding and failure of polymer glasses under large deformation", S.Q. Wang, S.W. Cheng, *Polymer Glasses*, ed. C. Roth, Taylor&Francis, 2016.

1. "Examining an alternative molecular mechanism to toughen glassy polymers", M. Razavi, D. Huang, S. Liu, H. Guo and S. Q. Wang, *Macromolecules* **53**, 323 (2020).
2. Characterizing effects of fast melt deformation in glassy states", Z. Zhao, J. N. Liu, W. Y. Wang, J. W. Mays, and S. Q. Wang, *J. Chem. Phys.* **151**, 124906 (2019).
3. "Exploring rheological responses to uniaxial stretching of various entangled polyisoprene melts", Y. Feng, J. Liu, S. Q. Wang *et al.*, *J. Rheol.*, **63**, 763 (2019).
4. "Why crystalline poly(lactic acid) is brittle at room temperature?", M. Razavi and S. Q. Wang, *Macromolecules*, **52**, 5429 (2019).
5. "Brittle-ductile transition in uniaxial compression of polymer glasses", L. N. Liu, Z. Zhao, W. Y. Wang, J. W. Mays and S. Q. Wang, *J. Polym. Sci. Polym. Phys.* **57**, 758 (2019).
6. "Letter to the Editor: Melt rupture unleashed by few chain scission events in fully stretched strands", S. Q. Wang, *J. Rheol.* **63**, 105 (2019).
7. "From Wall Slip to Bulk Shear Banding in Entangled Polymer Solutions", S. Q. Wang, *Macrol. Chem. Phys.* **220**, 1800327 (2019).
8. "Chain network: Key to the ductile behavior of polymer glasses", Z. N. Liu, X. X. Li, Y. X. Zheng, S. Q. Wang and M. Tsige, *Macromolecules* **51**, 1666 (2018).
9. "Illustrating the molecular origin of mechanical stress in ductile deformation of polymer glasses", X. X. Li, J. N. Liu, Z. N. Liu, M. Tsige and S. Q. Wang, *Phys. Rev. Lett.*, **120**, 077801 (2018).
10. "Strain localization during squeeze of an entangled polymer melt under constant force", X. G. Li and S. Q. Wang, *J. Rheol.* **62**, 491 (2018).
11. "Watching shear thinning in creep: Entanglement-disentanglement transition", S. R. Ge, X. Y. Zhu and S. Q. Wang, *Polymer* **125**, 254 (2017).
12. "Origin of mechanical stress and rising internal energy during fast uniaxial extension of polymer melts", P. P. Lin, Z. G. Wang and S. Q. Wang, *Polymer* **124**, 68 (2017).
13. "Challenging conditions to observe shear banding in highly entangled polybutadiene solutions", *Rheol.: open access* **1**, 104 (2017).
14. "Effects of molecular weight reduction on brittle−ductile transition and elastic yielding due to noninvasive γ irradiation on polymer glasses", P.P. Lin *et al. Macromolecules* **50**, 2447 (2017).
15. "How and why polymer glasses lose their ductility due to plasticizers", Y. Zhao, J. N. Liu, X. X. Li, Y. Lu and S. Q. Wang, *Macromolecules* **50**, 2024 (2017).
16. "Experiments-inspired molecular modeling of yielding and failure of polymer glasses under large deformation", S.Q. Wang, S.W. Cheng, *Polymer Glasses*, ed. C. Roth, Taylor&Francis (2016).
17. "Delineating nature of stress responses during ductile uniaxial extension of polycarbonate glass", P. P. Lin, J. N. Liu and S. Q. Wang, *Polymer* **89**, 143 (2016).

18. "Entangled linear polymer solutions at high shear: from strain softening to hardening", G. X. Liu and S. Q. Wang, *Macromolecules* **49**, 9647 (2016).
19. "Finite cohesion due to chain entanglement in polymer melts", S. W. Cheng, Y. Y. Lu, G. X. Liu and S. Q. Wang, *Soft Matter* **12**, 3340 (2016).
20. "Nonlinear stress relaxation behavior of ductile polymer glasses from large extension and compression", J.N. Liu, P.P. Lin, X.X. Li and S.Q Wang, *Polymer*, **81**, 129 (2015).
21. "Polystyrene glasses under compression: ductile and brittle behavior", J. N. Liu, S. W. Cheng and S.Q. Wang, *ACS Macro Lett.* **4**, 1072 (2015).
22. "Mapping brittle and ductile behaviors of polymeric glasses under large extension", X. X. Li, S. W. Cheng and S. Q. Wang, *ACS Macro Lett.* **4**, 1110 (2015).
23. "Erratum: Nonisothermal condition in past melt extension experiments", P. P. Lin and S. Q. Wang, *J. Rheol.* **59**, 1329 (2015).
24. "Failure behavior after stepwise uniaxial extension of entangled polymer melts", H. Sun *et al. J. Rheol.* **59**, 751 (2015).
25. "Shear banding in entangled polymers in micron-scale gap: a confocal-rheoscopic study", P. E. Boukany, *et al.*, *Soft Matter* **11**, 8058 (2015).
26. "Nonlinear rheology of entangled polymers at turning point", S. Q. Wang, Opinion Article, *Soft Matter* **11**, 1454 (2015).
27. "A phenomenological molecular model for brittle-ductile transition and yielding of polymer glasses", S. Q. Wang, S. W. Cheng, P. P. Lin and X. X. Li, *J. Chem. Phys.* **141**, 094905 (2014).
28. "Rheology of entangled polymers not far above glass transition temperature: transient elasticity and inter-segmental viscous stress", H. Sun and S. Q. Wang, *Macromolecules* **47**, 5839 (2014).
29. "Strain hardening during uniaxial compression of polymer glasses", P. P. Lin, S. W. Cheng and S. Q. Wang, *ACS Macro Lett.* **3**, 784 (2014).
30. "Letter to the Editor: Sufficiently entangled polymers do show shear strain localization at high enough Weissenberg numbers", S. Q. Wang, G. X. Liu, S. W. Cheng, P. E. Boukany, Y. Y. Wang and X. Li, *J. Rheol.* **58**, 1059 (2014).
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33. "Strain hardening in startup shear of long-chain branched polymer solutions", G. X. Liu *et al.*, *Phys. Rev. Lett.* **111**, 068302 (2013).
34. "Crazing and strain localization of polycarbonate glass in creep", S. W. Cheng, L. Johnson, S. Q. Wang, *Polymer* **54**, 3363 (2013).
35. "Breakdown of time-temperature equivalence in startup uniaxial extension of entangled polymer melts", H. Sun and S. Q. Wang, *Macromolecules* **46**, 4151 (2013).
36. "New experiments for improved theoretical description of nonlinear rheology of entangled polymers", S. Q. Wang, Y. Y. Wang, S. W. Cheng, X. Li, X. Y. Zhu and H. Sun, *Macromolecules* **46**, 3147 (2013).
37. "Elastic yielding in cold drawn polymer glasses well below the glass transition temperature", S. W. Cheng and S. Q. Wang, *Phys. Rev. Lett.* **110**, 065506 (2013).

38. "Exploring shear yielding and strain localization at the die entry during extrusion of entangled melts", X. Y. Zhu and S. Q. Wang, *J. Rheol.* **57**, 349 (2013).
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60. Comment on "Nonmonotonic models are Not necessary to obtain shear banding phenomena in entangled polymer solutions", S. Q. Wang, *Phys. Rev. Lett.* **103**, 219801 (2009).
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