

Curriculum vitae

Kai Zhang

Prof. Dr.

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Education

Dresden University of Technology, Dresden, Germany	<i>Mar. 2011</i>	Ph.D. (‘ <i>Summa cum laude</i> ’)
Dresden University of Technology, Dresden, Germany	<i>Jul. 2007</i>	Diplom Food Chemistry
Hefei University of Technology, Hefei, China	<i>Jul. 2002</i>	B.Eng. Food Science and Engineering

Professional experience

Since May 2015

Junior-Professor (*tenure-track*)
Wood Technology and Wood Chemistry
Georg-August-University of Göttingen, Germany

Since 2016

Adjunct Professor
Institute of Fundamental and Frontier Sciences (IFFS)
University of Electronic Science and Technology of China, Chengdu, China

2015 Call as Assistant Professor at Chalmers University of Technology, Sweden

2015 Call as Juniorprofessor at Freie Universität Berlin, Germany

Jan. 2015 – Apr. 2015

Guest researcher
Faculty for Chemistry
Darmstadt University of Technology, Germany

Jul. 2012 – Dec. 2014

Junior Research Group Leader
Soft Control – LOEWE Research Cluster of Hessen
Faculty for Chemistry
Darmstadt University of Technology, Germany

Jul. 2011 – Jun. 2012

Postdoctoral Fellow
the Center for Lignocellulose Structure and Formation
the Pennsylvania State University, US

Mar. 2011 – Jun. 2011

Postdoctoral Fellow
Institute of Plant and Wood Chemistry
Dresden University of Technology, Germany

Jul. 2007 – Mar. 2011

Research assistant
Institute of Plant and Wood Chemistry
Dresden University of Technology, Germany

Nov. 2006 – Jul. 2007

Graduate research assistant
Institute of Food Chemistry
Dresden University of Technology, Germany

Scientific activities

Editorial activities

2016	Scientific Reports	Editorial Board Member
2016-2020	Journal of Semiconductors	Editorial Board Member
2016-2018	Hydrogels	Associate Editor

Committee members

- 2019 Organizing Committee Member
9th World Congress on Spectroscopy and Analytical Techniques, Paris, France
- 2019 Organizing Committee Member
OLC Condensed Matter Physics Conference (OLCCMPC-2019), Valencia, Spain
- 2019 Organizing Committee Member
Material Research 2019, Osaka, Japan
- 2019 Organizing Committee Member
SCON Molecular Biology 2019, Amsterdam, Netherlands
SCON Material Sciences 2019, Amsterdam, Netherlands
- 2018 Scientific Committee Member
The 5th International Conference on Pulping, Papermaking and Biotechnology (ICPPB'18), Nanjing, China

Memberships

- Member of Georg-August-University School of Science (GAUSS), Göttingen
- Member of German Chemical Society (GDCh)
- Member of American Chemical Society (ACS)
- Member of Zellcheming (Association of Pulp and Paper Chemists and Engineers)
- Member of Expert Committee of the Division for Cellulose and Cellulose Derivatives by Zellcheming (Association of Pulp and Paper Chemists and Engineers)

Peer-reviewed Journals2019

61. **Bo Pang, Huan Liu, Peiwen Liu, Hua Zhang**, Georg Avramidis, Longquan Chen, Xu Deng, Wolfgang Viöl, **Kai Zhang***. Robust, easy-cleaning superhydrophobic/superoleophilic copper meshes for oil/water separation under harsh conditions. **Advanced Materials Interfaces**, 2019, accepted.
60. **Heqin Huang, Xiaojie Wang**, Jinchao Yu, Ye Chen, Hong Ji, Yumei Zhang, Florian Rehfeldt, Yong Wang, **Kai Zhang***. Liquid Behaviors-Assisted Fabrication of Multidimensional Birefringent Materials from Dynamic Hybrid Hydrogels. **ACS Nano**, 2019, DOI: 10.1021/acsnano.9b00551.
59. **Xiaojie Wang, Heqin Huang, Huan Liu**, Florian Rehfeldt, Xiaohui Wang, **Kai Zhang***. Multi-Responsive Bilayer Hydrogel Actuators with Programmable and Precisely Tunable Motions, **Macromolecular Chemistry and Physics**, 2019, 1800562 (*cover*)
58. **Pascal Fuchs, Kai Zhang***. Efficient synthesis of organosoluble 6-azido-6-deoxy-2,3-O-trimethylsilyl cellulose for click reactions. **Carbohydrate Polymers**, 2019, <https://doi.org/10.1016/j.carbpol.2018.11.003>
57. **Kui Zeng**, Thomas Groth, **Kai Zhang***. Recent advances of artificially sulfated polysaccharides for applications in cell growth and differentiation, drug delivery and tissue engineering: a Mini-Review. **ChemBioChem**, 2019, <http://dx.doi.org/10.1002/cbic.201800569> (*Invited Review for "Issues ChemBioTalents"*)

2018

56. Huan Liu, Bo Pang, Renata Garces, Riza Dervisoglu, Longquan Chen, Loren Andreas, **Kai Zhang***. Helical fibers via evaporation-driven self-assembly of surface-acylated cellulose nanowhiskers. **Angewandte Chemie Int Ed**, 2018, DOI: <https://doi.org/10.1002/anie.201808250>
55. Hua Zhang, Kang Lv, Marcel C. Forster, Rıza Dervişoğlu, Loren B. Andreas, **Kai Zhang***, Shuiliang Chen*. Crucial Role for Oxygen Functional Groups in the Oxygen Reduction Reaction Electrocatalytic Activity of Nitrogen-doped Carbons. **Electrochimica Acta**, 2018, DOI: 10.1016/j.electacta.2018.09.175
54. Yuyuan Wang, Zicheng Liang, Zhiping Su, **Kai Zhang**, Junli Ren, Runcang Sun, Xiaohui Wang*. All-biomass fluorescent hydrogels based on biomass carbon dots and alginate/nanocellulose for biosensing. **ACS Applied Bio Materials**, 2018, DOI: 10.1021/acsbam.8b00348
53. Longquan Chen*, Yonggui Wang, Xiaoyan Peng, Qing Zhu, **Kai Zhang***. Impact of aqueous polymer droplets on superhydrophobic surfaces. **Macromolecules**, 2018, DOI: 10.1021/acs.macromol.8b01589
52. Yonggui Wang*, Chi Zhang, Jia Tian, Yanjun Xie, **Kai Zhang***. A Comparative Study of Self-Assembled Superstructures from Cellulose Stearoyl Ester and Poly(Vinyl Stearate). **Macromolecular Chemistry and Physics**, 2018, DOI: <https://doi.org/10.1002/macp.201800229>
51. Peiwen Liu, Bo Pang, Huan Liu, Lin Tian, Cynthia Volkert, Torsten Gutmann, Timmy Schäfer, Gerd Buntkowsky, **Kai Zhang***. Efficient, self-terminating isolation of cellulose nanocrystals via periodate oxidation in Pickering emulsions. **ChemSusChem**, 2018, accepted
50. Bo Pang, Robert Koehler, Vladimir Roddatis, Huan Liu; Xiaohui Wang, Wolfgang Viöl, **Kai Zhang***. One-Step Synthesis of Quadrilateral-Shaped Silver Nanoplates with Lamellar Structures Tuned by Amylopectin Derivatives. **ACS Omega**, 2018, DOI: 10.1021/acsomega.8b00833.

49. Shuang Wang, **Kai Zhang***. Glycosylated cellulose derivatives with regioselective distributions of pendant glucose moieties. **Carbohydrate Polymers**, 2018, 196, 154.
48. Yonggui Wang, Xiaojie Wang, Yanjun Xie, **Kai Zhang***. Functional Nanomaterials through Esterification of Cellulose: A Review of Chemistry and Application. **Cellulose**, 2018, DOI: <https://doi.org/10.1007/s10570-018-1830-3>. (*Review*)
47. Jiaxiu Wang, **Kai Zhang***, Modular Adjustment of Swelling Behaviors of Surface-Modified Solvent-Responsive Polymeric Nanoparticles Based on Cellulose 10-Undecenoyl Ester. **The Journal of Physical Chemistry C**, 2018, DOI: 10.1021/acs.jpcc.7b11521
46. Heqin Huang, Xiaojie Wang, Florian Rehfeldt, **Kai Zhang***. Dually heterogeneous hydrogels via dynamic and supramolecular crosslinks tuning discontinuous spatial ruptures. **ACS Sustainable Chemistry & Engineering**, 2018, DOI: 10.1021/acssuschemeng.7b04738.
45. P. Liu, C. Mai, **Kai Zhang***. Formation of hydrogels with uniform and gradient chemical structures using dialdehyde cellulose by aerating NH₃ gas. **Frontiers of Chemical Science and Engineering**, accepted. (Special issue)
44. Yawen Yao, Antje Gellerich, Michaela Zauner, Xiaoxu Wang, Kai Zhang*. Differential anti-fungal effects of hydrophobic and superhydrophobic wood based on cellulose and glycerol stearoyl esters. **Cellulose**, DOI: 10.1007/s10570-017-1626-x
43. Bo Pang, Huan Liu, Peiwen Liu, Xinwen Peng and Kai Zhang*. Water-in-oil Pickering emulsions stabilized by stearoylated microcrystalline cellulose. **Journal of Colloid and Interface Science**, 2018, <https://doi.org/10.1016/j.jcis.2017.11.079>

2017

42. Y. Wang, P. B. Groszewicz, S. Rosenfeldt, H. Schmidt, C. A. Volkert, P. Vana, T. Gutmann, G. Buntkowsky, **Kai Zhang***. Thermo-reversible self-assembly of cellulose-nanoparticles in dry state. **Advanced Materials**, 2017, DOI: <https://doi.org/10.1002/adma.201702473>
41. K. Niegelhella, M. Süßenbacher, J. Sattelkow, H. Plank, Yonggui Wang, **Kai Zhang**, S. Spirk*. How Bound and Free Fatty Acids in Cellulose Films Impact Nonspecific Protein Adsorption. **Biomacromolecules**, 2017, DOI: 10.1021/acs.biomac.7b01260
40. L. Chen*, L. Li, Z. Li, **Kai Zhang**. Submillimeter-sized bubble entrapment and high-speed jet during droplet impact on solid surfaces. **Langmuir**, 2017, DOI: 10.1021/acs.langmuir.7b01506
39. P. Liu, C. Mai, **Kai Zhang***. Formation of uniform multi-stimuli responsive and multi-block hydrogels from dialdehyde cellulose. **ACS Sustainable Chemistry & Engineering**, 2017, DOI: 10.1021/acssuschemeng.7b00646
38. H. Huang, Y. Wang, X. Wang, F. Rehfeldt, **Kai Zhang***. Robust heterogeneous hydrogels with dynamic nanocrystals-polymer conjunction. **Macromolecular Rapid Communications**, 2017, DOI: 10.1002/marc.201600810.
37. Binyu Zhao; Xiang Wang; **Kai Zhang**; Longquan Chen; Xu Deng. Impact of Viscous Droplets on Superamphiphobic Surfaces. **Langmuir**, 2017, 144.

2015-2016

36. Yonggui Wang, Jia Tian, Xu Deng, Longquan Chen, Sabine Rosenfeldt, Stephan Förster, Philipp Vana, **Kai Zhang***. Polymeric flaky nanostructures from cellulose stearoyl esters for functional surfaces. **Advanced Materials Interfaces**, 2016, 3, 1600636.
35. Y. Wang, T. Heinze, **Kai Zhang***. Stimuli-responsive nanoparticles from ionic cellulose derivatives. **Nanoscale**, 2016, 8, 648. (*Featured in ACS Green Chemistry Newsletter*)
34. Chao Wang, Richard A. Venditti, **Kai Zhang***. Tailor-made functional surfaces based on cellulose-derived materials. **Applied Microbiology and Biotechnology**, 2015, 99, 5791. (*invited review*)

33. **Kai Zhang**,* Andreas Geissler, Michaela Standhardt, Sabrina Mehlhase, Markus Gallei, Longquan Chen, Christina Marie Thiele. Moisture-responsive films of cellulose stearyl esters showing reversible shape transitions. *Scientific Reports*, 2015, 5, 11011.
32. Jiquan Liu, Andreas Plog, Pedro Groszewicz, Li Zhao, Yeping Xu, Hergen Breitzke, Annegret Stark, Rudolf Hoffmann, Torsten Gutmann,* **Kai Zhang**,* Gerd Buntkowsky.* Design of a novel heterogeneous catalyst based on cellulose nanocrystals for cyclopropanation: Synthesis and solid-state NMR characterization. *Chemistry - A European Journal*. 2015, 21, 1.
31. **K. Zhang**,* A. Geissler, X. Chen, S. Rosenfeldt, Y. Yang, S. Förster, F. Müller-Plathe C. Polymeric flower-like microparticles from self-assembled cellulose stearyl esters. *ACS Macro Letters*, 2015, 4, 214-219.
30. Y. Wang, L.-O. Heim, Y. Xu, G. Buntkowsky, **K. Zhang*** Transparent, Stimuli-responsive Films from Cellulose-based Organogel Nanoparticles. *Advanced Functional Materials*, 2015, 25, 1434-1441.
29. Y. Wang, X. Wang, L.-O. Heim, H. Breitzke, G. Buntkowsky, **K. Zhang**,* Superhydrophobic surfaces from surface-hydrophobized cellulose fibers with stearyl groups. *Cellulose*, 2015, 22, 289-299.
28. **K. Zhang**,* A. Geissler, T. Heinze. Reversibly crystalline nanoparticles from cellulose alkyl esters via nanoprecipitation. *Particle & Particle Systems Characterization* 2015, 32, 258-266.

2013-2014

27. L. Zhao, W. Li, A. Plog, Y. Xu, G. Buntkowsky, T. Gutmann,* **K. Zhang**,* Multi-responsive cellulose nanocrystal-rhodamine conjugates – An advanced structure study by solid-state dynamic nuclear polarization (DNP) NMR. *Physical Chemistry Chemical Physics*, (2014), 16, 26322.
26. A. Geissler, D. Scheid, W. Li, M. Gallei, **K. Zhang**,* One-pot formation of stimuli-responsive, fluorescent and magnetic nanoparticles based on sustainable cellulose stearyl ester via nanoprecipitation. *Cellulose*, 2014, 21, 4181.
25. C. Uth, S. Zielonka, S. Hörner, N. Rasche, A. Plog, O. Avrutina, H. Orelma, **K. Zhang**,* H. Kolmar,* A chemoenzymatic approach to protein immobilization onto crystalline cellulose nanoscaffolds. *Angewandte Chemie International Edition*, 2014, 53, 12618.
24. W. Li, W. Wang, Y. Yang, **K. Zhang**,* Redox-responsive, reversibly fluorescent nanoparticles from sustainable cellulose derivatives. *Journal of Materials Chemistry A* 2, 13675-13681 (2014)
23. L. Chen,* A. Geissler, E. Bonaccorso, **K. Zhang***, Transparent slippery surfaces made with sustainable porous cellulose lauroyl ester films. *ACS Applied Materials & Interfaces* 6, 6969 (2014).
22. Y. Wang, S. Yadav, T. Heinlein, V. Konjik, H. Breitzke, G. Buntkowsky, J. J. Schneider*, **K. Zhang***, Ultra-light nanocomposite aerogels of bacterial cellulose and reduced graphene oxide for specific absorption and separation of organic liquids. *RSC Advances* 4, 21553 (2014).
21. A. Geissler, M. Biesalski, T. Heinze, **K. Zhang***, Formation of nanostructured cellulose stearyl esters via nanoprecipitation. *Journal of Materials Chemistry A* 2, 1107 (2014).
20. A. Geissler, E. Bonaccorso, L. Heim, T. Heinze, **K. Zhang***, Temperature-Responsive Thin Films from Cellulose Stearyl Triester. *The Journal of Physical Chemistry C* 118, 2408 (2014).
19. A. Geissler, F. Loyal, M. Biesalski, **K. Zhang***, Thermo-responsive superhydrophobic paper using nanostructured cellulose stearyl ester. *Cellulose* 21, 357 (2014).
18. N. Aggarwal, N. Altgärde, S. Svedhem, **K. Zhang**, S. Fischer, T. Groth,* Study on multilayer structures prepared from heparin and semi-synthetic cellulose sulfates as

polyanions and their influence on cellular response. *Colloids and Surfaces B: Biointerfaces* **116**, 93 (2014).

17. N. Aggarwal, N. Altgärde, S. Svedhem, **K. Zhang**, S. Fischer, T. Groth,* Effect of molecular composition of heparin and cellulose sulfate on multilayer formation and cell response. *Langmuir* **29**, 13853 (2013).

16. A. Geissler, L. Chen, **K. Zhang***, E. Bonaccorso, M. Biesalski, Superhydrophobic surfaces fabricated from nano- and microstructured cellulose stearyl esters. *Chemical Communication* **49**, 4962 (2013).

15. **K. Zhang***, S. Fischer, A. Geissler, E. Brendler, K. Gebauer, Synthesis of carboxyl cellulose sulfates with regioselective sulfation and regiospecific oxidation using cellulose trifluoroacetate as intermediates. *Cellulose* **20**, 2069 (2013).

14. **K. Zhang***, Illustration of the development of bacterial cellulose bundles/ribbons by *Gluconacetobacter xylinus* via atomic force microscopy. *Applied Microbiology and Biotechnology* **97**, 4353 (2013).

2010-2012

13. **K. Zhang***, A. Geissler, S. Fischer, E. Brendler, E. Bäucker, Solid-state spectroscopic characterization of alpha-chitins deacetylated in homogeneous solutions. *The Journal of Physical Chemistry B* **116**, 4584 (2012).

12. **K. Zhang***, S. Fischer, A. Geissler, E. Brendler, Analysis of carboxylate groups in oxidized never-dried cellulose II catalyzed by TEMPO and 4-acetamide-TEMPO. *Carbohydrate Polymers* **87**, 894 (2012).

11. A. Weltrowski, M. L. da Silva Almeida, D. Peschel, **K. Zhang**, S. Fischer, T. Groth,* Mitogenic Activity of Sulfated Chitosan and Cellulose Derivatives is Related to Protection of FGF-2 from Proteolytic Cleavage. *Macromolecular Bioscience* **12**, 740 (2012).

10. D. Peschel, **K. Zhang**, S. Fischer, T. Groth,* Modulation of osteogenic activity of BMP-2 by cellulose and chitosan derivatives. *Acta Biomaterialia* **2012**, 8, 183.

9. **K. Zhang***, A. Feldner, S. Fischer, FT Raman spectroscopic investigation of cellulose acetate. *Cellulose* **18**, 995 (2011).

8. **K. Zhang***, E. Brendler, A. Geissler, S. Fischer, Synthesis and spectroscopic analysis of cellulose sulfates with regulable total degrees of substitution and sulfation patterns via ¹³C NMR and FT Raman spectroscopy. *Polymer* **52**, 26 (2011).

7. **K. Zhang***, D. Peschel, E. Bäucker, T. Groth, S. Fischer, Synthesis and characterisation of cellulose sulfates regarding the degrees of substitution, degrees of polymerisation and morphology. *Carbohydrate Polymers* **83**, 1659 (2011).

6. **K. Zhang**, E. Brendler, K. Gebauer, M. Gruner, S. Fischer,* Synthesis and characterization of low sulfoethylated cellulose. *Carbohydrate Polymers* **83**, 616 (2011).

5. **K. Zhang**, D. Peschel, J. Helm, T. Groth, S. Fischer,* FT Raman investigation of novel chitosan sulfates exhibiting osteogenic capacity. *Carbohydrate Polymers* **83**, 60 (2011).

4. **K. Zhang**, E. Brendler, S. Fischer,* FT Raman investigation of sodium cellulose sulfate. *Cellulose* **17**, 427 (2010).

3. **K. Zhang**, D. Peschel, T. Klinger, K. Gebauer, T. Groth, S. Fischer,* Synthesis of carboxyl cellulose sulfate with various contents of regioselectively introduced sulfate and carboxyl groups. *Carbohydrate Polymers* **82**, 92 (2010).

2. **K. Zhang**, J. Helm, D. Peschel, M. Gruner, T. Groth, S. Fischer,* NMR and FT Raman characterisation of regioselectively sulfated chitosan regarding the distribution of sulfate groups and the degree of substitution. *Polymer* **51**, 4698 (2010).

1. D. Peschel, **K. Zhang**, N. Aggarwal, E. Brendler, S. Fischer, T. Groth,* Synthesis of novel celluloses derivatives and investigation of their mitogenic activity in the presence and absence of FGF2. *Acta Biomaterialia* **6**, 2116, (2010). (Equal contribution)

Other publications

6. **K. Zhang**, D. Peschel, S. Fischer, T. Groth,* Novel Cellulose Derivatives with Mitogenic and Osteogenic Activity. In *Tailored Polymer Architectures for Pharmaceutical and Biomeical Applications. ACS Symposium Series 1135*, 259 (2013).
5. T. Groth,* D. Peschel, N. Aggrawal, A. Loeffler, A. Weltrowski, **K. Zhang**, S. Fischer, Novel cellulose and chitosan sulfates promoting the activity of growth Factors FGF-2 and BMP-2. *Journal of Tissue Engineering and Regenerative Medicine 6*, 13 (2012). (Special issue)
4. **K. Zhang***, A. Weltrowski, D. Peschel, S. Fischer, T. Groth, Synthesis and Characterization of Biologically Active Chitosan Sulfates. In *Functional Materials from Renewable Sources. ACS Symposium Series 1107*, 297 (2012).
3. N. Aggrawal, G.P.A. Michanetzis, Y. Missirlis, **K. Zhang**, S. Fischer, T. Groth,* PH variation during lay-by-layer assemblies of natural and artificial glycosaminoglycans to control cell adhesion. *International Journal of Artificial Organs 34*, 615, (2011). (Special issue)
2. D. Peschel, **K. Zhang**, N. Aggarwal, S. Fischer, T. Groth,* Cooperation of derivatized polysaccharides and growth factors and their effects on the proliferation and differentiation of different cells. *International Journal of Artificial Organs 33*, 440 (2010). (Special issue)
1. **K. Zhang**, D. Peschel, E. Brendler, T. Groth, S. Fischer,* Synthesis and Bioactivity of Cellulose Derivatives. *Macromolecular Symposium 280*, 28 (2009).