Tabellarischer Lebenslauf und Publikationsliste

Dr. Martin D. Hager

Institut für Organische Chemie und Makromolekulare Chemie (IOMC)
Jena Center for Soft Matter (JCSM)
Center for Energy and Environmental Chemistry Jena (CEEC Jena)
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Geburtsdatum: 6. Februar 1980

Forschungsschwerpunkte:

- **Selbstheilende Materialien**
  - Selbstheilende Polymere basierend auf reversiblen kovalenten Bindungen
  - Metallosupramolekulare selbstheilende Polymere
  - Selbstheilende funktionale Polymere
- Polymere und Energie
  - Redoxaktive Polymere für polymer-basierte Batterien (Folienbatterien, Redox-Flow-Batterien)
  - Konjugierte Polymere

Ausbildung und wissenschaftliche Karriere:

2000-2005	Chemiestudium, Friedrich-Schiller-Universität Jena
2003	Vordiplom/Bachelor in Chemie (1,1) Friedrich-Schiller-Universität Jena
2005	Diplom in Chemie (Abschluss: 1,0; “mit Auszeichnung”), Friedrich-Schiller-Universität Jena
2005-2007	Doktorarbeit, Friedrich-Schiller-Universität Jena (Prof. E. Klemm)
2007	Promotion (“summa cum laude”)
2007-2008	PostDoc, Eindhoven University of Technology (Prof. U. S. Schubert)
2008-heute	Junior group leader/Habilitand, Friedrich-Schiller-Universität Jena, Institut für Organische Chemie und Makromolekulare Chemie (Prof. U. S. Schubert)

Administrative Aufgaben und Mitgliedschaften:

2008-2012	Projektleiter von zwei Projektes im Dutch Polymer Institute (DPI)
2010-2015	Wissenschaftlicher Projektleiter im Konsortium “PhoNa” (BMBF Spitzenforschung in den neuen Ländern)
Seit 2011	Mitglied des Jena Center for Soft Matter (JCSM)
2011-2014	Leiter Forschergruppe „Neue Materialien und Verfahren für effiziente Energiespeicher“
2011-2017	Scientific administrator (SPP 1568 – “Design and Generic Principles of Self-healing materials”)
Seit 2014	Koordinator Center for Energy and Environmental Chemistry Jena

Preise, Ehrungen und wissenschaftliches Ranking:

- 133 Publikationen in referierten Journalen (29 als korrespondierender Autor), 3690 Zitate, h-Index: 30 (Quelle: Web of Science 02/18)
- Vorträge u.a. bei ACS National Meetings (2007 Washington, 2011 Denver, 2014 San Francisco), International Conference on Self-healing Materials - ICSHM (Bath 2011, Ghent 2013, Durham 2015, Friedrichshafen 2017), EuChems (Prag 2012)
- Editor Volume „Self-healing materials“ (*Adv. Polym. Sci.*) mit U. S. Schubert und S. van der Zwaag

2005	Landesgraduiertenstipendium
2005-2007	FCI Stipendium
2011	Programm zur Förderung der Drittmittelfähigkeit von Nachwuchswissenschaftlerinnen und Nachwuchswissenschaftlern
2013	Teilnahme am Hochschullehrer-Nachwuchs-Workshop ("Habilitanden-Workshop") der GDCh-Fachgruppe Makromolekulare Chemie
2015	Clustersieger Chemie/Kunststoffe des IQ Innovationspreis Mitteldeutschland 2015 (mit Prof. Dr. U. S. Schubert und T. Janoschka)
2017	Thüringer Forschungspreis für Angewandte Forschung (mit Prof. Dr. U. S. Schubert und T. Janoschka)

Drittmittelprojekte:

BMBF: Nachwuchswissenschaftler im “Spitzencluster” PhoNa
DFG (SPP 1568): Teilprojekt mit Prof. Dr. Ulrich S. Schubert, Prof. Dr. Jürgen Popp und Prof. Dr. Benjamin Dietzek
DFG (SPP 1568): Projekt mit Prof. Dr. Benjamin Dietzek
Forschergruppe (Thüringer Aufbaubank): Gemeinsame Koordination mit Prof. Dr. Ulrich S. Schubert
Koordination von drei bilateralen Industrieprojekten
Maßgebliche Beteiligung u.a. bei BMBF-Projekten (2 Projekte, 900 k€), DFG-Projekten (8 Projekte, 2.600 k€), TAB (4 Projekte, 3.300 k€), Industrieprojekte (7 Projekte, 890 k€), Thüringer Kultusministerium (1.600 k€), Neubau CEEC Jena I (14,5 Mio. €), Neubau CEEC Jena II (27 Mio. €)

Ausbildung und Lehre:

Vorlesungen im Bereich der Makromolekularen Chemie an der FSU Jena
(Makromolekulare Chemie – Bachelor Chemie, Makromolekulare Chemie I und II – Master Chemie, Polymere und Energie – Master Werkstoffwissenschaften und Master Chemie-Energie-Umwelt)
Vorlesung Grundlagen Energiesysteme (Master Chemie-Energie-Umwelt)
Oberassistent im Praktikum Makromolekulare Chemie

Zertifikat „Lehrqualifikation Advanced“ (2012)

Publikationsliste:

	Publikation in referierten Journalen
[1]	A. Winter, C. Friebe, M. D. Hager, U. S. Schubert*, *Advancing the solid state properties of metallo-supramolecular materials: poly(ε-caprolactone) modified π-conjugated bis(terpyridine)s and their Zn(II) based metallo-polymers,* *Macromol. Rapid. Comm.* **2008**, *29*, 1679-1686.
[2]	L. Blankenburg, M. D. Hager, S. Sell, S. Sensfuss, E. Klemm*, *TPA-PPEs - new alternating donor copolymers for potential application in photovoltaic devices,* *J. Appl. Polym. Sci*. **2009**, *111*, 1850-1861.
[3]	B. Happ, C. Friebe, A. Winter, M. D. Hager, R. Hoogenboom, U. S. Schubert*, *2-(1H-1,2,3-Triazol-4-yl)-pyridine ligands as alternatives to 2,2 '-bipyridines in ruthenium(II) complexes,* *Chem. Asian J.* **2009**, *4*, 154-163.
[4]	B. Schulze, C. Friebe, M. D. Hager, A. Winter, R. Hoogenboom, H. Goerls, U. S. Schubert*, *2,2':6',2''-Terpyridine meets 2,6-bis(1H-1,2,3-triazol-4-yl)pyridine: tuning the electro-optical properties of ruthenium(II) complexes* *Dalton* **2009**, 787-794.
[5]	A. Winter, C. Friebe, M. D. Hager, U. S. Schubert*, *Synthesis of rigid π -conjugated mono-, bis-, tris-, and tetrakis-(terpyridine)s: influence of the degree and pattern of substitution on the photophysical properties,* *Eur. J. Org. Chem*. **2009**, 801-809.
[6]	B. Happ, R. Hoogenboom, A. Winter, M. D. Hager, S. O. Baumann, G. Kickelbick, U. S. Schubert*, *2-[1-(1-Naphthyl)-1H-1,2,3-triazol-4-yl]pyridine,* *Act. Cryst. E* **2009**, *65*, O1146-U3140.
[7]	A. Winter, A. Wild, R. Hoogenboom, M. W. M. Fijten, M. D. Hager, R. A. Fallahpour, U. S. Schubert*, *Azido- and ethynyl-substituted 2,2':6',2''-terpyridines as suitable substrates for click reactions,* *Synthesis* **2009**, 1506-1512.

[8]	U. Mansfeld, M. D. Hager, R. Hoogenboom, C. Ott, A. Winter, U. S. Schubert*, *Advanced supramolecular initiator for nitroxide-mediated polymerizations containing both metal-ion coordination and hydrogen-bonding sites,* *Chem. Comm.* **2009**, 3386-3388.
[9]	A. Winter, C. Friebe, M. Chiper, M. D. Hager, U. S. Schubert*, *Self-assembly of π-conjugated bis(terpyridine) ligands with zinc(II) ions: new metallosupramolecular materials for optoelectronic applications,* *J. Polym. Sci., Part A: Polym. Chem.* **2009**, *47*, 4083-4098.
[10]	B. Happ, C. Friebe, A. Winter, M. D. Hager, U. S. Schubert*, *Click chemistry meets polymerization: controlled incorporation of an easily accessible ruthenium(II) complex into a PMMA backbone via RAFT copoly-merization,* *Europ. Polym. J.* **2009**, *45*, 3433-3441.
[11]	F. Schlütter, A. Wild, A. Winter, M. D. Hager, A. Baumgärtel, C. Friebe, U. S. Schubert*, *Synthesis and characterization of new self-assembled metallo-polymers containing electron-withdrawing and electron-donating bis(terpyridine) zinc(II) moieties,* *Macromolecules* **2010**, *43*, 2759-2771.
[12]	A. Wild, C. Friebe, A. Winter, M. D. Hager, U.-W. Grummt, U. S. Schubert*, *pi-Conjugated 2,2 ':6 ',2 ''-bis(terpyridines): systematical tuning of the optical properties by variation of the linkage between the terpyridines and the pi-conjugated system,* *Eur. J. Org. Chem.* **2010**, *10*, 1859-1868.
[13]	K. Knop, B. O. Jahn, M. D. Hager, A. Crecelius, M. Gottschaldt, U. S. Schubert*, *Systematic MALDI-TOF CID investigation on different substituted mPEG 2000,* *Macromol. Chem. Phys.* **2010**, *211*, 677-684.
[14]	A. Wild, F. Schlütter, G. M. Pavlov, C. Friebe, G. Festag, A. Winter, M. D. Hager, V. Cimrova, U. S. Schubert*, *π-Conjugated donor and donor acceptor metallo-polymers* *Macromol. Rapid Comm.* **2010**, *31*, 868-874.
[15]	A. Wild, S. Hornig, F. Schlütter, J. Vitz, C. Friebe, M. D. Hager, A. Winter, U. S. Schubert*, *Complexation of terpyridine-containing dextrans: toward water-soluble supramolecular structures,* *Macromol. Rapid Comm.* **2010**, *31*, 921-927.

[16]	B. Happ, D. Escudero, M. D. Hager, C. Friebe, A. Winter, H. Görls, E. Altuntas, L. Gonzalez*, U. S. Schubert*, *N-Heterocyclic donor- and acceptor-type ligands based on 2-(1H-[1,2,3]triazol-4-yl)pyridines and their ruthenium(II) complexes* *J. Org. Chem.* **2010**, *75*, 4025-4038.
[17]	B. Schulze, C. Friebe, M. D. Hager, W. Günther, U. Köhn, B. O. Jahn, H. Görls, U. S. Schubert*, *Anion complexation by triazolium "ligands": mono- and bis-tridentate complexes of sulfate,* *Org. Lett.* **2010**, *12*, 2710-2713.
[18]	B. Beyer, C. Ulbricht, A. Winter, M. D. Hager, R. Hoogenboom, N. Herzer, S. O. Baumann, G. Kickelbick, H. Görls, U. S. Schubert*, *Unexpected metal-mediated oxidation of hydroxymethyl groups to coordinated carboxylate groups by bis-cyclometalated iridium(III) centers,* *New J. Chem.* **2010**, *34*, 2622-2633.
[19]	A. Krieg, C. Pietsch, M. D. Hager, C. R. Becer*, U. S. Schubert*, *Dual hydrophilic polymers based on (meth)acrylic acid and poly(ethylene glycol) - synthesis and water uptake behavior,* *Polym. Chem.* **2010**, *1*, 1669-1676.
[20]	M. D. Hager*, P. Greil, C. Leyens, S. van der Zwaag, U. S. Schubert*, *Self-healing materials,* *Adv. Mater.* **2010**, *22*, 5424-5430. (ESI highly cited paper)
[21]	B. Happ, G. M. Pavlov, E. Altuntas, C. Friebe, M. D. Hager, A. Winter, H. Görls, W. Günther, U. S. Schubert*, *Self-assembly of 3,6-bis(4-triazolyl)pyridazine ligands with copper(I) and silver(I) Ions: time-dependant 2D-NOESY and ultracentrifuge measurements* *Chem. Asian. J.* **2011**, *6*, 873-880.
[22]	F. Schlütter, G. M. Pavlov, J.-F. Gohy, A. Winter, A. Wild, M. D. Hager, S. Hoeppener, U. S. Schubert*, *Synthesis, characterization and micellization studies of coil-rod-coil ruthenium(II) terpyridine assemblies with π-conjugated electron acceptor systems* *J. Polym. Sci., Part A: Polym. Chem.* **2011**, *49*, 1396-1408.
[23]	G. Whittell, M. D. Hager, U. S. Schubert*, I. Manners*, *Functional soft materials from metallo- and metallosupramolecular polymers* *Nature Mater.* **2011**, *10*, 176-188. (ESI highly cited paper)

[24]	B. Schulze, D. Escudero, C. Friebe, R. Siebert, H. Görls, U. Köhn, E. Altuntas, A. Baumgärtel, M. D. Hager, A. Winter, B. Dietzek*, J. Popp, L. González*, U. S. Schubert*, *A heteroleptic bis(tridentate) ruthenium(II) complex of a click-derived abnormal carbine pincer ligand with potential for photosensitzer application* *Chem. Eur. J.* **2011**, *17*, 5494-5498.
[25]	F. Kloß, U. Köhn, M. D. Hager, B. O. Jahn, H. Görls, U. S. Schubert*, *Metal-free regioselective azide-alkyne [3+2]-cycloaddition in water* *Chem. Asian J.* **2011**, *10*, 2816-2824.
[26]	B. Happ, J. Schäfer, R. Menzel, M. D. Hager, A. Winter, J. Popp, R. Beckert*, B. Dietzek*, U. S. Schubert*, *Synthesis and resonance energy transfer study on a random terpolymer containing a 2-(pyridine-2-yl)thiazole donor-type ligand and a luminescent $[Ru(bpy)_2(2\text{-}(triazole\text{-}4\text{-}yl)pyridine)]^{2+}$ chromophore* *Macromolecules* **2011**, *44*, 6277-6287.
[27]	A. Winter, M. D. Hager, G. R. Newkome*, U. S. Schubert*, *The marriage of terpyridines and inorganic nanoparticles: Synthetic aspects, characterization techniques and potential applications* *Adv. Mater.* **2011**, *23*, 5728-5748.
[28]	E. Altuntas, K, Knop, L, Tauhardt, K. Kempe, A. C. Crecelius, M. Jaeger, M. D. Hager, U. S. Schubert*, *Tandem mass spectrometry of poly(ethylene imine)s by electrospray ionization (ESI) and matrix-assisted laser desorption/ionization (MALDI)* *J. Mass Spec.* **2012**, *47*, 105-114.
[29]	B. Happ, A. Winter, M. D. Hager, U. S. Schubert*, *Photogenerated avenues in macromolecules containing d6 metal complexes with N-heterocylic ligands* *Chem. Soc. Rev.* **2012**, *41*, 2222-2255.
[30]	A. Wild, A. Winter, M. D. Hager, U. S. Schubert*, *Fluorometric sensor based on bisterpyridine metallopolymer: detection of cyanide and phosphates in water* *Analyst* **2012**, *137*, 2333-2337.
[31]	A. Wild, K. Babiuch, M. Konig, A. Winter, M. D. Hager, M. Gottschaldt, A Prokop, U. S. Schubert*, *Synthesis of a glycopolymeric Pt-II carrier and its induction of apoptosis in resistant cancer cells* *Chem. Commun.* **2012**, *48*, 6357-6359.

[32]	C. Friebe, M. D. Hager, A. Winter, U. S. Schubert*, *Metal-containing polymers via electropolymerization* *Adv. Mater.* **2012**, *24*, 332-345.
[33]	A. Wild, A. Winter, M. D. Hager, U. S. Schubert*, *Fluorometric, water-based sensors for the detection of nerve gas G mimics DMMP, DCP and DCNP* *Chem. Commun.* **2012**, *48*, 964-966.
[34]	T. Janoschka, A. Teichler, A. Krieg, M. D. Hager, U. S. Schubert*, *Polymerization of free secondary amine bearing monomers by RAFT polymerization and other controlled radical techniques* *J. Polym. Sci., Part A: Polym. Chem.* **2012**, *50*, 1394-1407.
[35]	D. Escudero, B. Happ, A. Winter, M. D. Hager, U. S. Schubert*, L. Gonzalez*, *The radiative decay rates tune the emissive properties of ruthenium(II) polypyridyl complexes: A computational study* *Chem. Asian J.* **2012**, *7*, 667-671.
[36]	B. Schulze, C. Friebe, S. Hoeppener, G. M. Pavlov, A. Winter, M. D. Hager, U. S. Schubert*, *Ruthenium(II) metallo-supramolecular polymers of click-derived tridentate ditopic ligands* *Macromol. Rapid Comm.* **2012**, *33*, 597-602.
[37]	A. Wild, A. Winter, M. D. Hager, H. Görls, U. S. Schubert*, *Perfluorophenyl-terpyridine ruthenium complex as monomer for fast, efficient, and mild metallopolymerizations* *Macromol. Rapid Comm.* **2012**, *33*, 517-521.
[38]	A. M. Breul, J. Schäfer, C. Friebe, F. Schluetter, R. M. Paulus, G. Festag, M. D. Hager, A. Winter, B. Dietzek*, J. Popp, U. S. Schubert*, *Synthesis and characterization of poly(methyl methacrylate) backbone polymers containing side-chain pendant ruthenium(II) bis-terpyridine complexes with an elongated conjugated system* *Macromol. Chem. Phys.* **2012**, *213*, 808-819.
[39]	G. M. Pavlov*, A. M. Breul, M. D. Hager, U. S. Schubert*, *Hydrodynamic and molecular study of poly{4-[4-(hexyloxy)phenyl]-ethynylphenyl methacrylate} in dilute solutions and conformational peculiarities of brush-like macromolecules* *Macromol. Chem. Phys.* **2012**, *213*, 904-916.

[40]	B. Happ, J. Schäfer, C. Friebe, H. Görls, A. Winter, M. D. Hager, J. Popp, B. Dietzek*, U. S. Schubert*, *Chelating fluorine dyes as mono- and ditopic 2-(1H-1,2,3-triazol-4-yl)pyridine ligands and their corresponding ruthenium(II) complexes* *Synthesis* **2012**, *44,* 2287-2294.
[41]	A. M. Breul, C. Pietsch, R. Menzel, J. Schäfer, A. Teichler, M. D. Hager, J. Popp, B. Dietzek*, R. Beckert*, U. S. Schubert*, *Blue emitting side-chain pendant 4-hydroxy-1,3-thiazoles in polystyrenes synthesized by RAFT polymerization* *Eur. Polym. J.* **2012**, *48,* 1339-1347.
[42]	B. Happ, G. M. Pavlov, I. Perevyazko, M. D. Hager, A. Winter, U. S. Schubert*, *Induced charge effect by Co(II) complexation on the conformation of a copolymer containing a bidentate 2-(1,2,3-triazol-4-yl)pyridine chelating unit* *Macromol. Chem. Phys.* **2012**, *213*, 1339-1348.
[43]	M. J. Barthel, K. Babiuch, T. Rudolph, J. Vitz, S. Hoeppener, M. Gottschaldt, M. D. Hager, F. H. Schacher, U. S. Schubert*, *Bis-hydrophilic and functional triblock terpolymers based on polyethers: Synthesis and self-assembly in solution* *J. Polym. Sci., Part A: Polym. Chem.* **2012**, *50*, 2914-2923.
[44]	A. M. Breul, J. Schäfer, G. M. Pavlov, A. Teichler, S. Hoeppener, C. Weber, J Nowotny, L. Blankenburg, J. Popp, M. D. Hager*, B. Dietzek*, U. S. Schubert*, *Synthesis and characterization of polymethacrylates containing conjugated oligo(phenylene ethynylene)s as side chains* *J. Polym. Sci., Part A: Polym. Chem.* **2012**, *50*, 3192-3205.
[45]	C. von der Ehe, K. Kempe, M. Bauer, A. Baumgärtel, M. D. Hager, D. Fischer*, U. S. Schubert*, *Star-shaped block copolymers by copper-catalyzed azide-alkyne cycloaddition for potential drug delivery applications* *Macromol. Chem. Phys.* **2012**, *213*, 2146-2156.
[46]	T. Janoschka, M. D. Hager, U. S. Schubert*, *Powering up the future: radical polymers for battery applications* *Adv. Mater.* **2012**, *24*, 6397-6409. (ESI highly cited paper)

[47]	U. Mansfeld, A. Winter, M. D. Hager, R. Hoogenboom, W. Günther, U. S. Schubert*, *Orthogonal self-assembly of stimuli-responsive supramolecular polymers using one-step prepared heterotelechelic building blocks* *Polym. Chem.* **2013**, *4*, 113-123.
[48]	A. M. Breul, J. Schäfer, C. Friebe, E. Altuntas, M. D. Hager, A. Winter, B. Dietzek, J. Popp, U. S. Schubert*, *Incorporation of polymerizable osmium(II)- bis-terpyridine complexes into PMMA backbones* *J. Inorg. Org. Polym. Mater.* **2013**, 23, 74-80.
[49]	J. Schäfer, A. Breul, E. Birckner, M. D. Hager, U. S. Schubert, J. Popp, B. Dietzek*, *Fluorescence study of energy transfer in PMMA polymers with pendant oligo-phenylene-ethynylenes* *ChemPhysChem* **2013**, *14*, 170-178.
[50]	A. Wild, A. Teichler, C. L. Ho, X. Z. Wang, H. M. Zhan, F. Schlütter, A. Winter, M. D. Hager, W. Y. Wong*, U. S. Schubert*, *Formation of dynamic metallo-copolymers by inkjet printing: towards white-emitting materials* *J. Mater. Chem. C* **2013**, *1*, 1812-1822.
[51]	S. Bode, L. Zedler, F. H. Schacher, B. Dietzek, M. Schmitt, J. Popp, M. D. Hager*, U. S. Schubert*, *Self-healing polymer coatings based on crosslinked metallosupramolecular copolymers* *Adv. Mater.* **2013**, *25*, 1634-1638. (ESI highly cited paper)
[52]	A. Teichler, J. Perelaer, F. Kretschmer, M. D. Hager, U. S. Schubert*, *Systematic investigation of a novel low-bandgap terpolymer library via inkjet printing: influence of ink properties and processing conditions* *Macromol. Chem. Phys.* **2013**, *214*, 664-672.
[53]	M. J. Barthel, T. Rudolph, A. Teichler, R. M. Paulus, J. Vitz, S. Hoeppener, M. D. Hager, F. H. Schacher*, U. S. Schubert*, *Self-healing materials via reversible crosslinking of poly(ethylene oxide)-block-poly(furfuryl glycidyl ether) (PEO-b-PFGE) block copolymer films* *Adv. Funct. Mater.* **2013**, *23*, 4921-4932.
[54]	U. Mansfeld, A. Winter, M. D. Hager, W. Günther, E. Altuntas, U. S. Schubert*, A homotelechelic bis-terpyridine macroligand: one-step synthesis and it's metallo-supramolecular self-assembly *J. Polym. Sci., Part A: Polym. Chem.* **2013**, *51*, 2006-2015.
[55]	A. Breul, M. D. Hager*, U. S. Schubert*, *Fluorescent monomers as building blocks for dye labeled polymers: synthesis and application in energy conversion, biolabeling and sensors* *Chem. Soc. Rev.* **2013**, *42*, 5366-5407.

[56]	A. Wild, A. Teichler, C. von der Ehe, A. Winter, M. D. Hager, B. Yao, B. Zhang, Z. Xie, W.-Y. Wong*, U. S. Schubert*, *Zn(II)-bisterpyridine metallopolymers: improved processability by the introduction of polymeric side chains* *Macromol. Chem. Phys.* **2013**, *214*, 1072-1080.
[57]	J. Kötteritzsch, S. Stumpf, S. Hoeppener, J. Vitz, M. D. Hager*, U. S. Schubert*, *One-component intrinsic self-healing coatings based on reversible crosslinking by Diels-Alder-cycloadditions* *Macromol. Chem. Phys.* **2013**, *214*, 1636-1649.
[58]	T. Janoschka, A. Teichler, B. Häupler, T. Jähnert, M. D. Hager, U. S. Schubert*, *Reactive inkjet printing of cathodes for organic radical batteries* *Adv. Energy Mater.* **2013**, *3*, 1025-1028.
[59]	S. Bode, R. K. Bose, S. Matthes, M. Ehrhardt, A. Seifert, F. H. Schacher, R. M. Paulus, S. Stumpf, B. Sandmann, J. Vitz, A. Winter, S. Hoeppener, S. J. Garcia, S. Spange, S. van der Zwaag*, M. D. Hager*, U. S. Schubert*, *Self-healing metallopolymers based on cadmium bis(terpyridine) complex containing polymer networks* *Polym. Chem.* **2013**, *4*, 4966-4973.
[60]	B. Sandmann, B. Happ, J. Vitz, M. D. Hager, P. Burtscher, N. Moszner, U. S. Schubert*, *Photoinduced polymerization of multifunctional azides and alkynes* *Polym. Chem.* **2013**, *4*, 3938-3942.
[61]	J. Kötteritzsch, U. S. Schubert*, M. D. Hager*, *Triggered and Self-Healing Systems Using Nanostructured Materials* *Nanotech. Rev.* **2013**, *2*, 699-723.
[62]	B. Sandmann, S. Bode, M. D. Hager*, U. S. Schubert*, *Metallopolymers as an emerging class of self-healing materials* *Adv. Polym. Sci.* **2013**, *262*, 239-258.
[63]	T. Jähnert, B. Häupler, T. Janoschka, M. D. Hager, U. S. Schubert*, *Synthesis and charge-discharge studies of poly(ethynylphenyl)-galvinoxyles and their use in organic radical batteries with aqueous electrolytes* *Macromol. Chem. Phys.* **2013**, *214*, 2616-2623.
[64]	F. Kretschmer, S. Mühlig, S. Hoeppener, A. Winter, M. D. Hager, C. Rockstuhl, T. Pertsch, U. S. Schubert*, *Survey of plasmonic nanoparticles: From synthesis to application* *Part. Part. Syst. Char.* **2014**, *31*, 721-744
[65]	F. Kretschmer, U. Mansfeld, S. Hoeppener, M. D. Hager, U. S. Schubert*, *Tunable synthesis of poly(ethylene imine)-gold-nanoparticle clusters* *Chem. Commun.* **2014**, *50*, 88-90.

[66]	B. Sandmann, B. Happ, M. D. Hager, J. Vitz, E. Rettler, P. Burtscher, N. Moszner, U. S. Schubert*, *Efficient Cu(I) acetate catalyzed cycloaddition of multifunctional alkynes and azides: From solution to bulk polymerization* *J. Polym. Sci., Part A: Polym. Chem.* **2014**, *52*, 239-247.
[67]	A. M. Breul, J. Kübel, B. Häupler, C. Friebe, M. D. Hager, A. Winter, B. Dietzek, U. S. Schubert*, *Synthesis and characterization of polyphenylacetylenes with Ru(II) bis-terpyridine complexes in the side chain* *Macromol. Rapid Commun.* **2014**, *35*, 747-751.
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