学术报告

Periodic mesoporous (organo)silicas (PM(O)Ss): From synthesis to applications

报告人：梁玉仓 博士

时　间：2017年10月28日 9:30-10:00

地　点：北京化工大学多功能厅

报告内容：

Mesoporous materials featuring well-defined symmetry, high-surface area, and ordered “periodic” pore arrays have emerged as excellent research platforms for efficient intrapore chemistry, and have been extensively applied in catalysis, biology, drug delivery, adsorption and separation. Subtle changes of the synthesis parameters can markedly affect the physical and chemical properties of the final nanostructured materials, such as the surface structure/morphology (hydrophobicity and hydrophilicity, the distribution of surface species), the catalytic reactivity and selectivity, and the spatial environment. The present presentation will focus on synthesis of PM(O)Ss, surface modification and their applications in catalysis, drug release etc.

报告人简介：

Dr Liang is Senior Scientist and teacher (permanent appointment) in Nanoscience, Department of Chemistry, University of Tübingen, Auf der Morgenstelle 18, 72076 Tübingen, Germany. The research interests of Liang group focus on the preparation and characterization of nanostructured inorganic materials with designed topologies and shapes as well as controlled particle sizes. These inorganic materials include biocompatible monodisperse silica nanospheres with or without pore structure, the functionalized core-shell structured mesoporous silica nanospheres, quantum dots, and metal/metal oxide nanoscale materials with special chemical and physical properties (optical and magnetic properties). We investigate their applications in biomedicine (drug delivery and release, medical imaging, gene transfection, bioseparations, and antimicrobial nanopowders and coatings etc), in environment (toxicity of nanoparticles in alive cells) and in catalysis. Moreover, the synthesis of membrane is also one of our topics. We explore their applications in antireflective, antifogging, water treatment and nanofilltration.

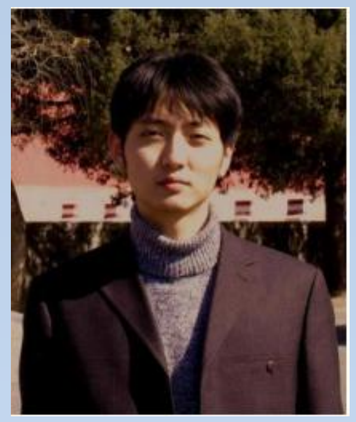
部分代表作：

1. Zhenping Qin, Xiaoyan Ren, Linglong Shan, Honxia Guo, Changle Geng, Guojun Zhang,Shulan Ji, and Yucang Liang, Nacrelike-structured multilayered polyelectrolyte/-calcium carbonate nanocomposite membrane via ca-incorporated layer-by-layerassembly and CO_2-induced biomineralization, ***J. Membr. Sci***., 2016, 498, 180-191.
2. Erwan Le Roux, Yucang Liang, Michael P. Storz, and Reiner Anwander, Intramolecular hydroamination/cyclization of aminoalkenes catalyzed by Ln[N(SiMe3)3]3 grafted onto periodic mesoporous ilicas, J. Am. Chem. Soc., 2010, 132, 16368-16371.
3. Yucang Liang, Rong Cao, Weiping Su, Maochun Hong, and Wenjian Zhang, Syntheses, structures, and magnetic properties of two gadolinium(III)-copper(II) coordination polymers by a hydrothermal reaction, Angew. Chem. Int. Ed. Engl., 2000, 39, 3304-3307; Angew. Chem., 2000, 39, 3442-3445.

北京化工大学苏志强教授课题组

学术报告

Cellular effect and biomimetic properties in vitro of novel 4,5-Dialkylated imidazolium NHC salts



报告人：王达 博士

时　　间：2017年10月28日 11:00-11:30

地　　点：北京化工大学多功能厅

报告内容：

4,5-Dialkylimidazolium N-heterocyclic (NHC) salts are a novel class of alkylated imidazolium derivatives showing extraordinary biological activities, especially their cellular toxicity.1 In comparison to simple 1-alkylimidazolium cations, 4,5-dialkylation in the backbone of the imidazole core greatly contribute to the improvement of an approximately three orders of magnitude high cellular effect due to their structurally resemblance to natural membrane lipids.2 In order to clarify the structure-activity relationship (SAR) of such imidazolium lipids, they were tailor-made by varying the alkyl chain length (C7, C11 and C15) as well as by fine-turning the N-substituents (wingtip groups) of the imidazolium ring, which is furnished by either N-methylation or N-benzylation. 1,2-Dipalmitoyl-sn-glycerol-3-phosphocholine (DPPC), was used as a representative monolayer and bilayer model membrane system in vitro. The membrane behavior of the imidazolium lipids within DPPC monolayers was characterized by surface pressure-area (π-A) isotherms using a Wilhelmy film balance in combination with epi-fluorescence microscopy (EFM). For a mixed lipid bilayer system, membrane binding and insertion of the imidazolium lipids were analyzed by a quartz crystal microbalance (QCM) and confocal laser scanning microscopy (CLSM). Further, all-atom molecular dynamics (MD) simulations were performed to provide mechanistic insights on a molecular level. The long alkyl chains (C15) exhibit a rigidification effect on both DPPC monolayer and bilayer structures, allowing to highly mimic the biophysical behavior of phospholipids. Howerver, the incorporation of the medium chains (C11) results in a thermodynamically unfavored mixed monolayer with DPPC and disordered DPPC liposomes. The short chains (C7) display negligible membrane effect due to their poor contribution to the surface activity. On the other hand, N-benzylation of the imidazole core not only remarkably improves the surface activity but also endows the imidazolium lipids to strongly disintegrate membranes. We conclude that for 4,5-dialkylated imidazolium NHC salts, both, the steric effect of the N-substituents as well as the hydrophobic mismatch from the backbone alkyl chains modulate their potential biological activities.

报告人简介：

王达 博士曾在德国明斯特大学生物化学研究所担任助理研究员，现为南开大学药物化学生物学国家重点实验室从事博士后研究。其主要研究方向为倍半萜内酯类药物的抗肿瘤活性及血脑屏障通透性研究。同时，在体外细胞毒性研究方面，他证明了基于生物膜磷脂分子结构的新型离子液体 4,5-二烷基咪唑盐对 C6 胶质瘤细胞具有极强的杀伤效果。在体外血脑屏障研究方面，证明了 4,5-二烷基咪唑盐对猪脑毛细血管内皮细胞（ PBCEC）体外血脑屏障通透性及完整性的影响高度依赖于 4,5 位疏水烷基链链长、 N-取代基种类及有效浓度。

北京化工大学苏志强教授课题组

学术报告

In situ monitoring Nano-Bio interactions by fluorescence techniques

报告人：尚利 教授

时　间：2017年10月28日 11:30-12:00

地　点：北京化工大学多功能厅

报告内容：

Nanotechnology holds great promise for applications in many fields including biology and medicine. Unfortunately, the processes occurring at the interface between nanomaterials and living systems are exceedingly complex and not yet well understood. Fluorescence-based spectral and microscopic techniques provide a robust method capable of in situ examining the behavior of nanomaterials while they are in exact biological environment. In the past few years, we have systematically investigated interactions between representative fluorescent NPs (e.g., quantum dots and metal nanoclusters) and common bio-systems (i.e., proteins and cells) by the combined use of fluorescence spectroscopic and microscopic techniques as well as quantitative analysis methods. We hope these studies provide an important foundation for the design and development of engineered NPs for future cancer diagnostic, drug delivery and bioimaging applications.

报告人简介：

尚利 教授，洪堡学者，中组部“千人计划”青年项目入选者。2004年本科毕业于武汉大学化学与分子科学学院，2010年博士毕业于中国科学院长春应用化学研究所，导师为董绍俊院士（TWAS）。研究生期间荣获中科院院长优秀奖及中科院优秀博士论文。2010年前往德国卡尔斯鲁厄理工学院从事博士后工作，2016年起任职于西北工业大学材料学院。主要从事纳米生物分析的基础和应用研究，迄今已在Acc. Chem. Res.、Nat. Chem.、Nano. Today、Angew. Chem. Int. Ed.、Adv. Funct. Mater.、Chem. Sci.等国际刊物发表论文60余篇。文章被引用4500余次，9篇入选ESI高被引论文，H因子为35。

部分代表作：

1. A.E. Nel, L. Madler, D. Velegol, T. Xia, et al., ***Nat. Mater***. 8 (2009) 543-557.
2. L. Shang, G.U. Nienhaus, ***Acc. Chem. Res***. 50 (2017) 387-395.
3. L. Shang, G.U. Nienhaus, ***Mater. Today*** 16 (2013) 58-66.
4. L. Shang, S. Shao, G.U. Nienhaus, ***Nano Today*** 6(4):401-418.

北京化工大学苏志强教授课题组

学术报告

Functional analysis of wildType and N471D strumpellin in hereditary spastic paraplegia

报告人：宋琳 博士
时　间：2017年10月28日 14:00-14:30
地　点：北京化工大学多功能厅
报告内容：

Hereditary Spastic Paraplegias (HSPs) are clinically characterized by lower limb weakness and spasticity. Several point mutations of human strumpellin (Str), with N471D being the most frequent one, have been shown to cause HSP (SPG8). To investigate the molecular function of wild-type and StrN471D, we generated Dictyostelium discoideum Str^- cells as well as cells that ectopically expressed StrWT-GFP or StrN471D-GFP in AX2 wild-type and Str^- cells and analyzed the resulting strains. Here, we describe their phenotypes in comparison to AX2 in cell division, cell growth, macropinocytosis, exocytosis, lysosome properties and secretion of lysosomal enzymes. We found that knock-out of strumpellin resulted in significant defects in all of these cellular processes. Expression of StrWT-GFP in Str^- cells rescued all of the observed defects while expression of StrN471D-GFP could only rescue some of the defects, indicating the importance of the StrN471D residue for full functionality of the protein. The results indicate that strumpellin plays a key role in the endo-lysosomal system. The N471D mutation apparently interferes with some of the essential functions of strumpellin in this system. In summary, our data provide a basis for a better understanding of the molecular mechanism of SPG8.

报告人简介：

Dr Lin is PhD candidate in Centre for Biochemistry, Medical Faculty, University of Cologne Joseph-Stelzmann-Str. 52, D-50931 Koeln Germany. She is familiar with many technique skills, including clinical, biochemistry, microbiology, animal model, molecular biology. She is Board member of Chinese-German Chemical Association ((GCCCD, Amtsgericht Köln, VR 17428)) and president of CGCA-west.

部分代表作：

1. Lin Song, Jun Mao, Jun Zhang, M.M Ibrahim, Lianhong Li, Jianwu Tang. Biomedicine & Pharmacotherapy. 2014, 68(3):377-384.
2. Lin Song, Jianwu Tang, Lawrence Owusu, Mingzhong Sun, Jun Wu, Jun Zhang. Clinica Chimica Acta. 2014, 431:185-191.
3. Lin Song,Jianwu Tang, Jun Zhang, Lei Sun,Bo Song,Yuhong Huang. Journal of Clinical and Pathology Research. 2014, 34(2):1-7.

北京化工大学苏志强教授课题组

学术报告

聚乳酸立构复合物的结构调控及其纤维的研发

报告人：张秀芹 教授
时　　间：2017年10月28日 15:30-16:00
地　　点：北京化工大学多功能厅

报告人简介：

张秀芹 理学博士，北京服装学院材料学院的教授，德国洪堡学者。主要从事生物可降解材料的高性能化和功能化的研发工作。承担和参加国家级、省部级科研项目20余项，发表SCI论文70余篇，授权国家发明专利12项，参与专著一部。作为研究骨干，曾获得2015年国家科技进步二等奖、“纺织之光”2014年度科学技术进步一等奖、2009年北京市科技进步一等奖以及2006年中国分析技术协会科学技术奖(CAIA 奖)一等奖。入选北京市“科技新星”和 “教育部新世纪优秀人才”称号。

部分代表作：

1. Yongai Yin, Xiuqin Zhang, Yan Song, Sicco de Vos, Ruyin Wang, Cornelis Joziasse, Guoming Liu and Dujin Wang. Effect of Nucleating Agents on the Strain–Induced Crystallization of Poly(L–lactide). ***Polymer*** 2015, 65(0), 223-232.
2. Yan Song, Xiuqin Zhang*, Yongai Yin, Sicco de Vos, Ruyin Wang, Cornelis A.P. Joziasse, Guoming Liu, Dujin Wang. Enhancement of stereocomplex formation in poly(L-lactide)/poly(D-lactide) mixture by shear. Polymer 2015, 72, 185-192.
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4. Xiaoyuan Zhang, Robert Schulze, Panpan Zhang, Claudia Lüdecke, Xiuqin Zhang*, Zhiqiang Su, Klaus D. Jandt. How Different Mesophases Affect the Interactive Crystallisation of a Block Co-oligomer. Polymer, 2014,55(7),1893-1900.
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北京化工大学苏志强教授课题组

学术报告

纳米生物活性玻璃在组织修复中的应用

报告人： 郑凯 博士
时　　间： 2017年10月28日 16:00-16:30
地　　点： 北京化工大学多功能厅

报告内容：

生物玻璃 （bioactive glasses）具有优异的生物活性和骨结合性，其降解产物能够促进生长因子的生成和细胞的增殖、增强成骨细胞的基因表达以及骨组织的生长。生物玻璃既能够与骨组织成键结合，同时又能与软组织相连接，因此可以用于人工骨、齿科以及软骨修复领域。通过调节组分和形貌，生物玻璃也可以用于创面愈合以及抗癌等应用。相比于微米级生物玻璃，纳米生物玻璃（nanocale bioactive glasses）其尺寸、形貌可控性较好，比表面积也较大，因此其生物活性也较高。纳米生物玻璃主要用做复合材料的填料来提高基体材料的性能，比如提高高分子基体的生物矿化性和生物活性。通过调控掺杂比例，纳米生物玻璃也能够提高基体材料的力学性能。本次报告主要介绍常用的生物玻璃纳米微球的合成策略以及其组分和形貌的调控。同时，也对本课题组在生物活性玻璃/高分子复合材料在骨修复以及创面愈合中的工作进行介绍。

报告人简介：

郑凯，男，浙江诸暨人。2017年3月获得德国埃朗根-纽伦堡大学（University of Erlangen-Nuremberg）博士学位。博士期间主要研究方向为溶胶凝胶法制备纳米生物活性玻璃及其在骨修复中的应用。现为欧盟玛丽居里Fellower继续在埃朗根-纽伦堡大学Boccaccini教授课题组从事博士后研究。当前主要研究方向为1.介孔纳米生物玻璃/水凝胶复合材料在骨修复及创面愈合的应用；2. 溶胶凝胶生物玻璃原子尺寸结构分析；3. 蛋白质/生物陶瓷表界面研究; 4. 高分子衍生生物陶瓷的制备。

部分代表作：

1. K. Zheng, X. Dai, M. Lu, N. Hüser, N. Taccardi and A. R. Boccaccini, Colloids Surfaces B Biointerfaces, 2017, 150, 159–167.
2. K. Zheng and A.R. Boccaccini, Advances in Colloid and Interface Science, 2017, https://doi.org/10.1016/j.cis.2017.03.008https://doi.org/10.1016/j.cis.2017.03.008 .
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7. K. Zheng, A. Solodovnyk, W. Li, O.-M. Goudouri, C. Stähli, S. N. Nazhat and A. R. Boccaccini, J. Am. Ceram. Soc., 2015, 98, 30–38.
8. K. Zheng, S. Yang, J. Wang, C. Rűssel, C. Liu and W. Liang, J. Non. Cryst. Solids, 2012, 358, 387–391.
9. D. Kozon, K. Zheng, E. Boccardi, Y. Liu, L. Liverani, and A. R. Boccaccini, Materials., 2016, 9, 225–233.

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