

Prof. Dr. An-Hui Lu

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Major Research Interests

Designed synthesis of porous carbon materials with various morphologies and pore structures;
Spatially controlled deposition of catalysts in catalyst supports and their application for heterogeneous catalysis;
Synthesis and encapsulation of nanoparticles;
Magnetically separable catalyst for quasi-homogeneous catalysis;
CO₂ capture

Professional Preparation

Taiyuan University of Technology (China), B.Sc. (1996) Organic Chemistry
Institute of Coal Chemistry, Chinese Academy of Science, Ph.D. (2001) Chemical Engineering
Institute of Physical Chemistry, Würzburg University (Germany), Research Fellow 2001-2002 Physical Chemistry
Max-Planck-Institut für Kohlenforschung (Germany), Postdoctoral Fellow and Alexander von Humboldt fellow 2002-2005 Heterogeneous Catalysis

Appointments

Professor, School of Chemical Engineering, Dalian University of Technology 2008-present
Group leader (Associate Professor) Department of Heterogeneous Catalysis, Max-Planck-Institut für Kohlenforschung, Germany, 2005-2009

Honor and Awards

2006 Brian Kelly Award.

2007-2008 Seasky Scholar of Dalian University of Technology.

2009 New Century Excellent Talents in University of China (NECT-09-0254).

Selected Publications

Book

A.-H. Lu, D. Zhao, Y. Wan, Nanocasting: A versatile strategy to create nanostructured porous materials, RSC Publishing, Oct. 2009.

1. **A.-H Lu***, T. Sun, W.-C. Li, Q. Sun, F. Han, D.-H. Liu, Y. Guo, Confined nanospace pyrolysis towards individual and dispersible hollow carbon nanospheres with high uniformity, *Angew. Chem. Int. Ed.* 2011, anie.201105486.
2. S. Wang, W.-C. Li, G.-P. Hao, Y. Hao, Q. Sun, X.-Q. Zhang, **A.-H Lu***, Temperature programmed precise control over the sizes of carbon nanospheres based on benzoxazine chemistry, *J. Am. Chem. Soc.* 2011, 133, 15304-15307.
3. **A.-H Lu***, G.-P. Hao, Q. Sun, Can carbon spheres be created through the classical Stöber method? *Angew. Chem. Int. Ed.* 2011, 50, 9023-9025. (invited highlight)
4. G.-P. Hao, W.-C. Li, D. Qian, G.-H. Wang, W.-P. Zhang, T. Zhang, A. Wang, F. Schüth, H. Bongard, and **A.-H Lu***, Structurally Designed Synthesis of Mechanically Stable Poly(benzoxazine-co-resol)-Based Porous Carbon Monoliths and Their Application as High-Performance CO₂ Capture Sorbents, *J. Am. Chem. Soc.* 2011, 133, 11378-11388.
5. G.-P. Hao, W.-C. Li, S. Wang, G.-H. Wang, L. Qi, **A.-H Lu***, Lysine-assisted rapid synthesis of crack-free hierarchical carbon monoliths with a hexagonal array of mesopores, *Carbon* 2011, 49, 3762-3772.
6. G.-P. Hao, W.-C. Li, **A.-H Lu***, Novel porous solids for carbon dioxide capture, *J. Mater. Chem.* 2011, 21, 6447-6451. (invited highlight)
7. M. Feyen, C. Weidenthaler, R. Güttel, K. Schlichte, U. Holle, **A.-H Lu***, F. Schüth*, High temperature stable iron based core-shell catalysts for ammonia decomposition, *Chem. Eur. J.* 2011, 17, 598-605.
8. **A.-H. Lu***, J.-J. Nitz, M. Comotti, C. Weidenthaler, K. Schlichte, C. W. Lehmann, O. Terasaki, F. Schüth, Spatially and size selective synthesis of Fe-based nanoparticles on ordered mesoporous supports as highly active and stable catalysts for ammonia decomposition, *J. Am. Chem. Soc.* 2010, 132, 14152-14162.
9. G.-P. Hao, W.-C. Li, S. Wang, S. Zhang, **A.-H Lu***, Tubular structured ordered mesoporous

- carbon as an efficient sorbent for the removal of dyes from aqueous solutions, *Carbon* 2010, 48, 3330–3339.
10. M. Feyen, C. Weidenthaler, F. Schüth, **A.-H. Lu***, Regioselectively controlled synthesis of colloidal mushroom nanostructures and their hollow derivatives, *J. Am. Chem. Soc.* 2010, 132, 6791–6799.
 11. M. Feyen, C. Weidenthaler, F. Schüth, **A.-H. Lu***, Synthesis of structurally stable colloidal composites as magnetically recyclable acid catalysts, *Chem. Mater.* 2010, 22, 2955–2961.
 12. **A.-H. Lu***, W.-C. Li, G.-P. Hao, B. Spliethoff, H.-J. Bongard, B. B. Schaack, F. Schüth, Easy synthesis of hollow polymer, carbon and graphitized microspheres, *Angew. Chem. Int. Ed.* 2010, 49, 1615–1618.
 13. G.-P. Hao, W.-C. Li, D. Qian, **A.-H. Lu***, Rapid synthesis of nitrogen-doped porous carbon monolith for CO₂ capture, *Adv. Mater.* 2010, 22, 853–857.
 14. Y. Liu, H. Tüysüz, C.-J. Jia, M. Schwickardi, R. Rinaldi, **A.-H. Lu**, W. Schmidt, F. Schüth, From glycerol to allyl alcohol: iron oxide catalyzed dehydration and consecutive hydrogen transfer, *Chem. Commun.* 2010, 46, 1238–1240.
 15. C.-J. Jia, Y. Liu, W. Schmidt, **A.-H. Lu**, F. Schüth, Small-sized HZSM-5 zeolite as highly active catalyst for gas phase dehydration of glycerol to acrolein, *J. Catal.* 2010, 269, 71–79.
 16. P. Brantona,* **A.-H. Lu**, F. Schüth, The effect of carbon pore structure on the adsorption of cigarette smoke vapour phase compounds, *Carbon* 2009, 47, 1005–1011.
 17. G.-H. Wang, W.-C. Li, K.-M. Jia, B. Spliethoff, F. Schüth, **A.-H. Lu***, Shape and size controlled α -Fe₂O₃ nanoparticles as supports for gold-catalysts: Synthesis and influence of support shape and size on catalytic performance, *Appl. Catal. A* 2009, 364, 42–47.
 18. **A.-H. Lu***, B. Spliethoff, F. Schüth, Aqueous synthesis of ordered mesoporous carbon via self-assembly catalyzed by amino acid, *Chem. Mater.* 2008, 20, 5314–5319.
 19. **A.-H. Lu**, E. L. Salabas, F. Schüth, Magnetic Nanoparticles: Synthesis, Protection, Functionalization and Application, *Angew. Chem. Int. Ed.* 2007, 46, 1222–1244. (invited review)
 20. **A.-H. Lu**, W.-C. Li, Z.-S. Hou, F. Schüth, Molecular level dispersed Pd clusters in the carbon walls of ordered mesoporous carbon as a highly selective alcohol oxidation catalyst, *Chem. Commun.* 2007, 1038–1040.
 21. S. Polarz, A. Orlov, F. Schüth, **A.-H. Lu**, Preparation of high-surface-area zinc oxide with ordered porosity, different pore sizes, and nanocrystalline walls, *Chem. Eur. J.* 2007, 13, 592–597.
 22. **A.-H. Lu**, F. Schüth, Nanocasting: A versatile strategy to create nanostructured porous materials, *Adv. Mater.* 2006, 18, 1793–1805. (invited review).

23. **A.-H. Lu**, W.-C. Li, W. Schmidt, F. Schüth, Low temperature oxidative template removal from SBA-15 using MnO_4 -solution and carbon replication of the mesoporous silica product, *J. Mater. Chem.* 2006, 16, 3396-3401.
24. W.-C. Li, M. Comotti, **A.-H. Lu**, F. Schüth, Nanocast mesoporous MgAl_2O_4 spinel monoliths as support for highly active gold CO oxidation catalyst, *Chem. Commun.* 2006, 1772-1774.
25. **A.-H. Lu***, W. Li, E.-L. Salabas, B. Spliethoff, F. Schüth, Low Temperature Catalytic Pyrolysis for the Synthesis of High Surface Area, Nanostructured Graphitic Carbon, *Chem. Mater.* 2006, 18, 2086-2094.
26. **A.-H. Lu**, W.-C. Li, N. Muratova, B. Spliethoff, F. Schüth, Evidence for C-C bond cleavage by H_2O_2 in a mesoporous CMK-5 type carbon at room temperature, *Chem. Commun.* 2005, 5184-5186.
27. W.-C. Li, **A.-H. Lu**, R. Palkovits, W. Schmidt, B. Spliethoff, F. Schüth, Hierarchically structured monolithic silicalite-1 consisting of crystallized nanoparticles and its performance in the Beckmann rearrangement of cyclohexanone oxime, *J. Am. Chem. Soc.* 2005, 127, 12595-12600.
28. W.-C. Li, **A.-H. Lu**, F. Schüth, Preparation of monolithic carbon aerogels and investigation of their pore interconnectivity by a nanocasting pathway, *Chem. Mater.* 2005, 17, 3620-3626.
29. **A.-H. Lu**, W. Schmidt, S. Tatar, B. Spliethoff, J. Popp, W. Kiefer, F. Schüth, Formation of amorphous carbon nanotubes on ordered mesoporous silica support, *Carbon* 2005, 43, 1811-1814.
30. **A.-H. Lu**, W.-C. Li, N. Matoussevitch, B. Spliethoff, H. Bönemann, F. Schüth, Highly stable carbon-protected cobalt nanoparticles and graphite shells, *Chem. Commun.* 2005, 98-100. (hot paper)
31. **A.-H. Lu**, J.-H. Smått, M. Lindén, Combined surface and volume templating of highly porous nanocasted carbon monoliths, *Adv. Funct. Mater.* 2005, 15, 865-871.
32. W.-C. Li, **A.-H. Lu**, W. Schmidt, F. Schüth, High surface area mesoporous glassy alumina with controllable pore size by nanocasting from carbon areogels, *Chem. Eur. J.* 2005, 11, 1658-1664.
33. W.-C. Li, **A.-H. Lu**, C. Weidenthaler, F. Schüth, Hard-templating pathway to create mesoporous magnesium oxide, *Chem. Mater.* 2004, 16, 5676-5681.
34. **A.-H. Lu**, W. Schmidt, B. Spliethoff, F. Schüth, Synthesis and characterization of nanocasted silica NCS-1 using CMK-3 as a template, *Chem. Eur. J.* 2004, 10, 6085-6092.
35. **A.-H. Lu**, W.-C. Li, A. Kiefer, W. Schmidt, E. Bill, G. Fink, F. Schüth, Fabrication of magnetically separable mesostructured silica with open pore system, *J. Am. Chem. Soc.* 2004,

126, 8616-8617.

36. **A.-H. Lu**, W. Schmidt, N. Matoussevitch, H. Bönnermann, B. Spliethoff, B. Tesche, E. Bill, W. Kiefer, F. Schüth, Nanoengineering of a magnetically separable hydrogenation catalyst, *Angew. Chem. Int. Ed.* 2004, 43, 4303-4306.
37. **A.-H. Lu**, W.-C. Li, W. Schmidt, W. Kiefer, F. Schüth, Easy synthesis of an ordered mesoporous carbon with a hexagonally packed tubular structure, *Carbon* 2004, 42, 2939-2948.
38. **A.-H. Lu**, A. Kiefer, W. Schmidt, F. Schüth, Synthesis of polyacrylonitrile-based ordered mesoporous carbon with tunable pore structures, *Chem. Mater.* 2004, 16, 100-103.
39. A.-H. Lu, W. Schmidt, B. Spliethoff, F. Schüth, Synthesis of ordered mesoporous carbon with bimodal pore system and high pore volume. *Adv. Mater.* 2003, 15, 1602–1606.
40. A.-H. Lu, W. Schmidt, A. Taguchi, B. Spliethoff, B. Tesche, F. Schüth, Taking nanocasting one step further: Replicating CMK-3 as a silica material. *Angew. Chem. Int. Ed.* 2002, 41, 3489–3492.