



学术报告

Carbon for Energy Storage

Dr. Denisa Jurcakova

The University of Queensland

报告地点: 催化基础国家重点实验室三楼会议室

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报告人简介:

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EDUCATION

Ph.D. in Chemical Engineering, Gunma University, Faculty of Engineering, Kiryu, Gunma, Japan, March 2003

Dissertation: Preparation of Carbon Nanotubes by Polymer Blend Technique

Advisor: Prof Asao Oya

Master of Science, Chemistry, Comenius University, Faculty of Natural Sciences, Bratislava, Slovakia, July 1998

Dissertation: Synthesis and Characterization of SiO₂-based Aerogel Catalysts

Advisor: Dr Vladimir Fajnor

AREAS OF SPECIALIZATION

I have been working in the field of carbon for more than seven years, specializing in nanostructured carbon for sustainable energy, with the particular interest in developing new carbon electrode materials for Electric double-layer capacitors. I am also involved in the research project for the preparation of novel magnetic carbon nanostructures for application in MRI as contrast agents.

RESEARCH EXPERIENCE

Research Fellow, 2006 – present

Postdoctoral Research Fellow, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, May 2003-2006

Postgraduate Research, Gunma University, Faculty of Engineering, Gunma, Kiryu, Japan, April 2000-March 2003

Graduate Research, Comenius University, Faculty of Natural Sciences, Bratislava, Slovakia, September 1993-July 1998

PUBLICATIONS

1. Hulicova*, D.; Kodama, M.; Hatori, H. Electrochemical Performance of Nitrogen-Enriched Carbons in Aqueous and Non-Aqueous Supercapacitors. *Chem. Mater.* 18 (9), 2318-2316, 2006
2. Hulicova, D.; Yamashita, J.; Soneda, Y.; Hatori, H.; Kodama, M. Supercapacitors Prepared from Melamine-based Carbon. *Chem. Mat.* 17(5), 1241-1247, 2005
3. Hulicova, D.; Hosoi, K.; Kuroda, S.; Oya, A. Carbon Nanotubes Prepared from Three-layered Copolymer Microspheres of Acrylonitrile and Methylmethacrylate. *Carbon* 43, 1246-1253, 2005
4. Oya, A.; Yokoyama, T.; Yamamoto, M.; Hulicova, D. A Novel Preparation Method of Carbon Nanotubes by Spinning Core/shell Polymer Particles. *Key Eng. Mat.* 264-268, 2275-2278, 2004
5. Hulicova, D.; Oya, A. Polymer Blend Technique as a Method to Design Fine Carbon Materials. *Carbon* 41, 1443-1450, 2003
6. Hulicova, D.; Hosoi, K.; Kuroda, S.; Abe, H.; Oya, A. Carbon Nanotubes Prepared by Spinning and Carbonizing Fine Core-shell Microspheres. *Adv. Mat.* 14, 452-455, 2002
7. Hulicova, D.; Hosoi, K.; Kuroda, S.; Abe, H.; Oya, A. Carbon Nanotubes Prepared from Polymer Microspheres by Spinning and Carbonizing. *Mol. Cryst. Liq. Cryst.* 387, 107-112, 2002
8. Shiraishi, S.; Kurihara, H.; Okabe, K.; Hulicova, D.; Oya, A. Electric Double Layer Capacitance of Highly Pure Single-walled Carbon Nanotubes (HiPcoTMBuckytubes™) in Propylene Carbonate Electrolytes. *Electrochem. Comm.* 4, 593-598, 2002
9. Hulicova, D.; Sato, F.; Koishi, M.; Oya, A. An Attempt to Prepare Carbon Nanotubes by the Spinning of Microcapsules. *Carbon* 39, 1438-1442, 2001

* please note that I use my maiden name Denisa Hulicova in all my publications

PAPERS PRESENTED AT INTERNATIONAL CONFERENCES

1. Hulicova, D.; Kodama, M.; Yamashita, J.; Soneda, Y.; Hatori, H.; Kamegawa, K. Capacitors Electrodes from Nitrogen-enriched Carbon Materials. *Carbon 2005*, Gyeongju, Korea, July 3-7, 2005 (Keynote lecture)
2. Hulicova, D.; Soneda, Y.; Kodama, M.; Hatori, H. The Capacitive Performance of Nitrogen-enriched Carbon in Different Electrolytes. 207th Meeting of the Electrochemical Society, Quebec, Canada, May 15-20, 2005
3. Hulicova, D.; Yamashita, J.; Soneda, Y.; Hatori, H.; Kodama, M. Preparation and Characterization of Supercapacitors Manufactured from Melamine-Based Carbon. 206th Meeting of the Electrochemical Society, Honolulu, Hawaii, USA, October 3-8, 2004
4. Kodama, M.; Hulicova, D.; Yamashita, J.; Soneda, Y.; Hatori, H.; Kamegawa, K.; Miyajima, N. Structural and Electrochemical Properties of Nitrogen-enriched Mesoporous Carbon. 206th Meeting of the Electrochemical Society, Honolulu, Hawaii, USA, October 3-8, 2004
5. Hulicova, D.; Yamashita, J.; Soneda, Y.; Hatori, H.; Kodama, M. Electrochemical Properties of Nitrogen-enriched Carbon Prepared from Melamine. International Symposium on Nanocarbons, Nagano, Japan, November 15-18, 2004
6. Hulicova, D.; Kodama, M.; Yamashita, J.; Soneda, Y.; Hatori, H. Electrochemical Properties of Melamine-based Carbon. *Carbon 2004*, Providence, Rhode Island, USA, July 11-16, 2004
7. Kodama, M.; Hulicova, D.; Yamashita, J.; Soneda, Y.; Hatori, H.; Kamegawa, K.; Miyajima, N. Structure and Electric Double Layer Capacitance of Nitrogen-enriched Mesoporous Carbons. *Carbon 2004*, Providence, Rhode Island, USA, July 11-16, 2004
8. Hulicova, D.; Oya, A.; Hosoi, K.; Kuroda, S. Carbon Nanotubes Prepared Through the Spinning of Polymer Microspheres. *Carbon 2002*, Beijing, China, September 15-19, 2002
9. Hulicova, D.; Hosoi, K.; Kuroda, S.; Oya, A. Multi-walled Carbon Nanotubes Prepared from Polymer Core/shell

LIST OF PATENTS

Japanese patents

Asao Oya, Denisa Hulicova, Katsuhiko Hosoi. Preparation Method of Carbon Nanotubes Including Other Elements. Japan Kokai Tokkyo Koho, 2004-99417

Asao Oya, Denisa Hulicova, Shin-ichi Kuroda. Carbon Nanotubes and Their Preparation Method. Japan Kokai Tokkyo Koho, 2003-146634

Asao Oya, Denisa Hulicova, Shin-ichi Kuroda. Carbon Nanotubes. Japan Kokai Tokkyo Koho, 2002-173308

Asao Oya, Denisa Hulicova, Shin-ichi Kuroda. Nanotubes and Their Preparation Method. Japan Kokai Tokkyo Koho, 2002-29719

Masaya Kodama, Denisa Hulicova. Preparation of Nitrogen-enriched Carbon. Japan Tokkyo Shutsugan, 2004-048826

International patent

Asao Oya, Denisa Hulicova, Shinichi Kuroda. Carbon Nanotubes and Method for Production Thereof. EP1411020A1

HONORS AND AWARDS

- JSPS Postdoctoral Fellowship, April 2004-present
- AIST Postdoctoral Fellowship, May 2003-April 2004
- Japanese Government Postgraduate Scholarship, April 1999-March 2003
- 2nd prize in the Faculty Thesis Competition, April 1998

LANGUAGE SKILLS

Slovak- native; English- fluent; Japanese- fluent

PERSONAL

Date of birth: 7th April 1975

Place of birth: Topolcany, Slovak Republic

Nationality: Slovak

报告摘要:

The talk will cover main research topics that I have been involved in since my postgraduate studies until recently.

Firstly, I will briefly introduce the research of my postgraduate studies, i.e. the development of new preparation method for carbon nanotubes. Polymer blending and spinning method was developed and successfully utilized in the preparation of MWCNTs by blending, melt-spinning and carbonizing fine polymer PAN core/PMMA shell microspheres.

Next topic will include the application of various carbons in supercapacitors. Different materials have been proposed as the electrode materials of supercapacitors, but carbon still plays the prime role owing to its price, abundance, good polarizability and versatile porous structure. Particularly interesting are the heteroatoms substituted carbons, i.e.

nitrogen-enriched carbons when the so-called pseudocapacitance arises on these electrochemically active sites. The preparation and characterization of nitrogen enriched carbons will be introduced and their electrochemical performance in various aqueous and non-aqueous electrolytes will be discussed in terms of surface chemistry and various functional groups present in carbon.

The ideas for the future research will be drawn at the end of the presentation including the synthesis of ordered graphitic mesoporous carbons (OGMCs) and their functionalization for high performance supercapacitors.

报告联系人：李灿

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