林 红

1987年毕业于清华大学化学系，1996年获日本名古屋大学应用化学专业工学博士学位。目前是清华大学材料科学与工程系副教授，主任助理（外事），担任新能源材料研究所副所长，新型陶瓷与精细工艺国家重点实验室副主任。主要致力于纳米材料的结构设计与制备、纳米材料的表面与界面化学、复合纳米材料的光化学与电化学，以及基于这些先进纳米材料科学的新能源利用，如染料敏化太阳能电池材料与器件、量子点敏化太阳能电池材料、聚合物太阳能电池、光/电解水电极材料、复合电解质等。

教育背景

1981年－1987年，清华大学化学系，物理化学专业，理学学士

1987年－1990年，中国科学院电子学研究所，电子物理及仪器专业，工学硕士

1990年－1992年，中国科学院电子学研究所，研究员

1992年－1996年，日本名古屋大学工学部应用化学系，应用化学专业，工学博士

工作履历

1996年－1998年，日本京都大学化学研究所，助研

1998年－2000年，日本关西新技术研究所，新素材中心无机材料研究部，研究员

2000年－2004年，日本产业技术综合研究所关西中心，博士后

2004年－至今，清华大学材料科学与工程系副教授，新型陶瓷与精细工艺国家重点实验室副主任

学术兼职

中国硅酸盐学会理事；

中国硅酸盐学会特陶分会理事；

中国能源学会常务理事；

中国可再生能源学会光化学专业委员会委员

研究领域

1) 纳米材料的结构设计与制备

2) 纳米材料的表面与界面化学

3) 复合纳米材料的光化学、电化学与光电化学

4) 染料敏化太阳能电池相关材料与器件

5) 量子点敏化太阳能电池材料

6) 聚合物太阳能电池材料

7) 光/电解水电极材料

8) 复合电解质

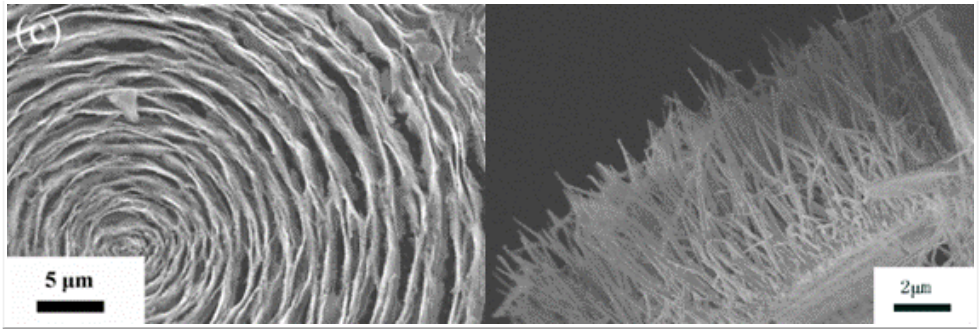
9) 石墨烯的低温合成

研究概况

染料敏化太阳能电池（Dye-sensitized Solar Cells, DSC）用光阳极材料

光阳极用低维氧化钛/氧化锌薄膜

染料敏化太阳能电池（Dye-sensitized Solar Cells, DSC）不仅要求光阳极具有大比表面积、而且要求光生电子在光阳极中快速传递。常用的光阳极材料为氧化钛/氧化锌。低维氧化钛和氧化锌纳米阵列薄膜即能保证其大比表面积，而且可以减小电阻，提高其电子传递速率。

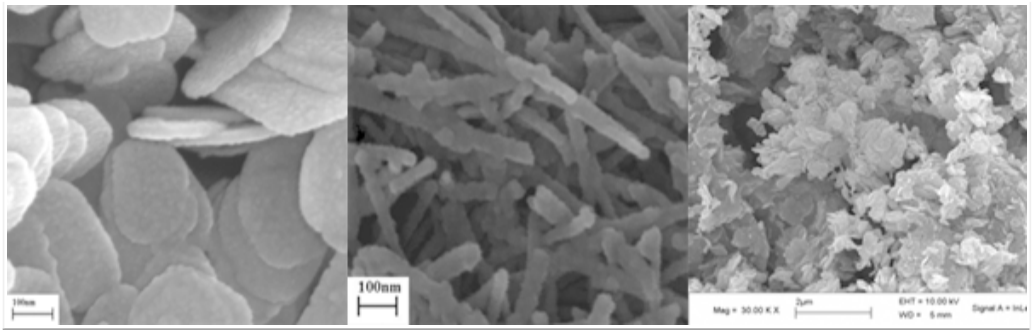


ZnO纳米带阵列薄膜　　TiO_2纳米棒阵列薄膜

DSC用电解质材料

准固态电解质的研究

DSC因为其高效率、低成本而倍受关注。目前常用的电解质为有机溶剂液态电解质，存在着溶剂易挥发、耐久性差等问题。离子液体是一种导电性好、不挥发、无毒性、常温下呈现液态的化合物。离子液体与无机纳米材料复合后，可以得到准固态电解质。准固态电池可以提高其长期稳定性。

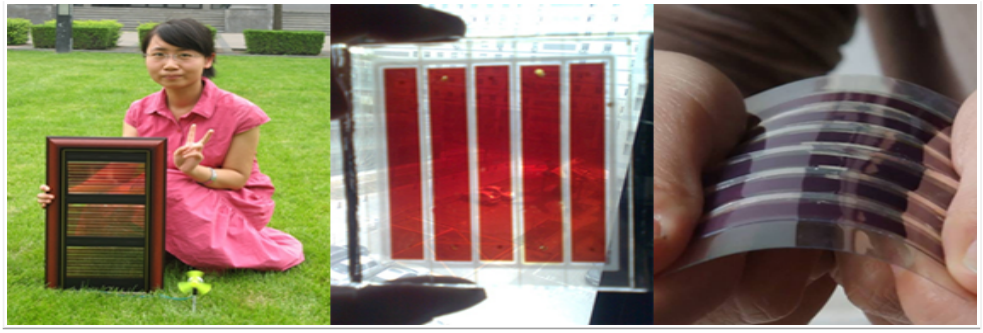


NiO纳米片　　NiO纳米棒　　层状 a-ZrP

太阳能电池器件

大面积DSC/柔性DSC的制备和应用

大面积DSC电池的制备工艺、组装、性能及耐久性研究，是太阳能电池产业化的基础。另外，柔性DSC具有可折叠、便携、轻便、成本低等特点，可用于手提电子产品的直接充电，也可以作到服装、帽子上为手提电子产品充电，还可以用做无通电地区的帐篷上的发电设备。

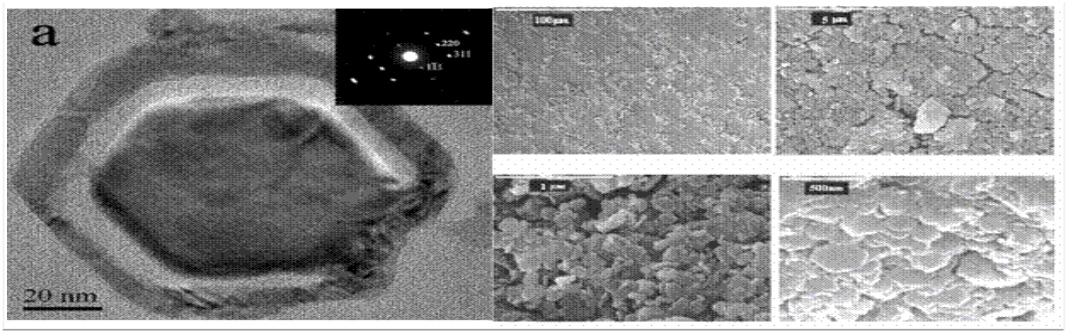


DSC驱动风扇　　透明 DSC　　柔性 DSC

其它

水电解阳极材料

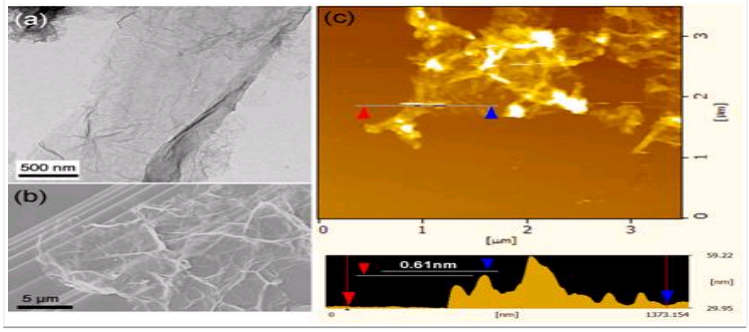
电解水制氢是获取氢气能源的一个主要途径。本课题组致力于降低析氧过电位方面的探索，从而降低电解水制氢能耗。目前主要集中于六方环片状Ni-Co尖晶石等催化材料的制备研究。



核－环结构 纳米$NiCo_2O_4$　　$NiCo_2O_4$膜电极

石墨烯的低温制备

石墨烯是二维单碳原子厚的具有极好的电导率、热导率、机械强度的新型碳材料，可以广泛应用于电子器件、催化、传感器、超级电容器和薄膜太阳能电池领域。低温催化还原法能够简单而大规模的制备石墨烯。



140℃还原得到的石墨烯

奖励与荣誉

2005/07/01 中国清华大学2005良师益友

2006/08/16　中国清华大学2006教学成果二等奖，排名第二

2006/08/16　中国清华大学2006优秀班主任二等奖

2006/10/28 日本陶瓷学会东海支部AYCeCT杰出青年陶瓷工作者奖

2006/12/31 中国清华大学材料系2006先进工作者

2007/05/25 日本陶瓷学会日中科学技术交流奖励奖

2007/12/31 中国清华大学材料系2007先进工作者

2009/03/31 日本化学会亚洲国际研讨会优秀讲演奖

2010/12/31 中国清华大学材料系2010先进工作者

2011/01/11 海南省科技进步一等奖，排名第四

学术成果

论文：

1. Y. Z. Liu, H. Lin, J. T. Dy, K. Tamaki, J. Nakazaki, D. Nakayama, S. Uchida, T. Kuboa, H.Segawa, N-fused carbazole-zinc porphyrin-free-base porphyrin triad for efficient near-IR dye-sensitized solar cells, Chem. Commun., 2011, DOI: 10.1039/c0cc03306e.

2. J. F. Li, H. Lin, Z. L. Yang, J. B. Li, A method for the catalytic reduction of graphene oxide at temperatures below 150℃, Carbon, 2011, in press.

3. F. Hao, H. Lin, Y. Z. Liu, J. B. Li, An alternative alkylpyridinium iodide with high electroactivitity for efficient dye-sensitized solar cells, Electrochem. Commun. 2011,DOI: 10.1016/j.elecom.2011.03.007.

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著书：

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专利：

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