

师资队伍

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正高职称 ([../szdw/zgzc.htm](#)) 副高职称 ([../szdw/fgzc.htm](#))

中级职称 ([../szdw/zjzc.htm](#))



赵宏生

职称: 研究员

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职务: 博士生导师

教育背景

学士	199507	西北工业大学	材料科学与工程
硕士	199802	西北工业大学	复合材料
博士	200106	西北工业大学	材料学

工作经历

200108 - 200309	清华大学材料系	博士后
200310 - 200411	清华大学核研院	助理研究员
200412 - 201911	清华大学核研院	副研究员/研究室党支部书记、副主任
201912 - 202005	清华大学核研院	研究员/研究室党支部书记、副主任

学术兼职

201809 – 202108 中国核学会辐照效应分会 常务理事

研究领域

主要开展新型先进核燃料元件的研发，高温气冷堆燃料元件的理化分析技术、质量控制体系和标准化研究，高温气冷堆燃料元件辐照试验研究，高温气冷堆燃料元件辐照后性能研究，燃料元件高性能抗氧化涂层的基础研究。

研究概况

201701 – 202012 高温堆球形燃料元件生产关键工艺和技术优化研究 国家科技重大专项
201701 – 202012 HTR-10超高温运行研究与安全分析 国家科技重大专项
201701 – 202012 高温气冷堆球形燃料元件表面复合涂层的调控设计、性能表征与抗氧化机理研究 国家自然科学基金
201101 – 202012 球形燃料元件辐照后性能研究 国家科技重大专项
201001 – 201812 球形燃料元件辐照试验研究 国家科技重大专项
201510 – 201809 碰撞摩擦耦合作用下燃料元件壳体石墨材料去除行为研究 清华大学自主科研计划
201601 – 201712 高温气冷堆球形燃料元件辐照后分析技术及失效机制研究 国际原子能机构技术合作项目
201410 – 201809 高温气冷堆燃料颗粒包覆层厚度高精度测量及其空间分布状态表征研究 国家重大科学仪器设备开发专项
201401 – 201812 10MW高温气冷堆超高温运行技术前期研究 国家863计划课题
201110 – 201912 模块式高温气冷堆核电站设计与建造规程 国家科技重大专项
200910 – 201712 高温气冷堆核电站示范工程燃料元件生产线建设 国家科技重大专项
200901 – 201612 球形燃料元件生产关键设备和工艺研究 国家科技重大专项
200901 – 201112 基于包混工艺的新型多孔碳化硅陶瓷的孔隙衍变机理及其对性能的影响研究 国家自然科学基金
200704 – 200903 网状SiC纳米线对多孔陶瓷的成型和性能作用机理研究 清华大学骨干人才支持计划
200509 – 200708 离子掺杂对Fe/Ce纳米薄膜光催化活性的作用机理研究 清华大学基础研究基金
200412 – 200706 新疆地产膨润土改性研究及其产品开发 新疆生产建设兵团博士资金项目

奖励与荣誉

2019 中国核能行业协会科技进步奖 一等 高温气冷堆球形燃料元件规模化制造关键技术研发及应用
2007 新疆生产建设兵团科学技术进步奖 三等 新疆地产膨润土改性研究及其产品开发
2003 陕西省科学技术奖 二等 闪烁玻璃用的基质玻璃研究

学术成果

杨辉, 周平, 张凯红, 李自强, 刘小雪, 赵宏生*. 致密SiC涂层在水蒸气及空气混合气氛中的氧化研究. 稀有金属材料与工程, 2020, 49(2): 526-532.

Hui Yang, Hongsheng Zhao*, Taowei Wang, Ziqiang Li, Xiaoxue Liu, Bing Liu. Review of oxidant resistant coating on the matrix graphite of HTR fuel element. Journal of Central South University, 2019, 26(11): 2915-2929.

Hui Yang, Hongsheng Zhao*, Taowei Wang, Kaihong Zhang, Ziqiang Li, Xiaoxue Liu, Bing Liu. SiC/YSiC composite coating on matrix graphite sphere prepared by pack cementation and molten salt. Ceramics International, 2019, 45(17A): 21917-21922.

Chi Zhang, Xiaotong Chen, Bing Liu, Zengtong Jiao, Luhao Fan, Gang Xu, Taowei Wang, Linfeng He, Meili Qi, Zhenming Lu, Hongsheng Zhao, Zaizhe Yin, Yaping Tang. The electrochemical deconsolidation mechanism of graphite matrix in HTGR spherical fuel elements. Journal of Nuclear Materials, 2019, 525: 1-6.

Hui Yang, Ping Zhou, Hongsheng Zhao*, Ziqiang Li, Xiaoxue Liu, Kaihong Zhang, Bing Liu. SiC coating on HTR graphite spheres prepared by fluidized-bed chemical vapor deposition. Annals of Nuclear Energy, 2019, 134: 11-19.

Hui Yang, Ping Zhou, Hongsheng Zhao*, Taowei Wang, Ziqiang Li, Xiaoxue Liu, Bing Liu. Corrosion of SiC layers on coated zirconia particles in wet atmosphere. Ceramics International, 2018, 44(11): 12797-12804.

S. Knol, S. de Groot, R.V. Salama, J. Best, K. Bakker, I. Bobeldijk, J.R. Westlake, M.A. Fütterer, M. Laurie, Chunhe Tang, Rongzheng Liu, Bing Liu, Hongsheng Zhao. HTR-PM fuel pebble irradiation qualification in the high flux reactor in petten. Nuclear Engineering and Design, 2018, 329: 82-88.

Zujie Zheng, Hongsheng Zhao*, Ziqiang Li, Xiaoxue Liu, Bin Wu, Bing Liu. Research on microstructure and oxidation resistant property of ZrSi₂-SiC/SiC coating on HTR graphite spheres. Ceramic International, 2018, 44(5): 4795-4800.

Bin Wu, Yue Li, Hong-sheng Zhao, Shuang Liu, Bing Liu, Jin-hua Wang*. Wear behavior of graphitic matrix of fuel elements used in pebble-bed high-temperature gas-cooled reactors against steel. Nuclear Engineering and Design, 2018, 328: 353-358.

Zujie Zheng, Ping Zhou, Hongsheng Zhao*, Xiaoxue Liu, Bing Liu. Research on ZrSi₂-SiC/SiC anti-oxidation coating on HTR graphite spheres. Transactions of the American Nuclear Society, 2017, 117: 608-612.

Ping Zhou, Zujie Zheng, Rongzheng Liu, Xiaoxue Liu, Malin Liu, Taowei Wang, Ziqiang Li, Youlin Shao, Hongsheng Zhao*, Bing Liu. Dual layer SiC coating on matrix graphite sphere prepared by pack cementation and fluidized-bed chemical vapor deposition. Journal of the American Ceramic Society, 2017, 100(8): 3415-3424.

Xiaotong Chen*, Zhenming Lu*, Hongsheng Zhao, Bing Liu, Junguo Zhu and Chunhe Tang. The electric current effect on electrochemical deconsolidation of spherical fuel elements. Science and Technology of Nuclear Installations, 2017, 2126876: 6.

Zujie Zheng, Ping Zhou, Hongsheng Zhao*, Ziqiang Li, Xiaoxue Liu, Kaihong Zhang, Bing Liu. ZrSi₂-SiC/SiC anti-oxidant coatings prepared on graphite spheres by two-step pack cementation process. Key Engineering Materials, 2017, 727: 953-958.

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- Hui Yang, Hongsheng Zhao*, Xiaoxue Liu, Ziqiang Li, Kaihong Zhang, Chunhe Tang. Microstructure evolution process of porous silicon carbide ceramics prepared through coat-mix method. *Ceramics International*, 2012, 38(3): 2213-2218.

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陈晓彤, 卢振明, 赵宏生, 刘兵, 唐春和, 朱钧国. 一种球形燃料元件解体装置: 中国, 201610262532.1, 2016-07-13, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201610262532.1.

刘马林, 赵宏生, 邵友林, 唐春和, 刘兵. 一种辐照后颗粒自动分选装置: 中国, 2015102199391, 2015-08-19, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201510219939.1.

周平, 赵宏生, 李自强, 张凯红, 刘小雪, 刘兵, 唐春和. 在反应堆用石墨材料表面制备SiC/SiO₂复合高温抗氧化涂层以及复合材料: 中国, 201510069925.6, 2015-05-13, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201510069925.6.

李自强, 赵宏生, 刘小雪, 王玮, 张凯红, 唐春和. 球形燃料元件无燃料区的自动检测系统及方法: 中国, 201410073831.1, 2014-05-28, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201410073831.1.

刘小雪, 赵宏生, 李自强, 张凯红, 唐春和. 一种测量包覆燃料颗粒的包覆层厚度的方法: 中国, 201410027774.3, 2014-05-07, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201410027774.3.

张凯红, 赵宏生, 刘小雪, 李自强, 唐春和. 球体元件专用防崩裂夹具: 中国, 201210455249.2, 2013-03-13, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201210455249.2.

张凯红, 赵宏生, 刘小雪, 李自强, 唐春和. 抗氧化性能检测设备: 中国, 201210228146.2, 2012-11-07, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201210228146.2.

李自强, 赵宏生, 张凯红, 王玮, 王康, 刘小雪, 唐春和. 球体工件直径检测系统及方法: 中国, 201210176630.5, 2012-09-26, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201210176630.5.

赵宏生, 张凯红, 李自强, 唐春和, 刘小雪. 一种检测球体元件落球强度的装置: 中国, 201110332665.9, 2012-06-20, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201110332665.9.

赵宏生, 张凯红, 刘小雪, 李自强, 唐春和. 一种微球及其表面涂层密度的测量方法: 中国, 201110318993.3, 2012-06-20, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201110318993.3.

李自强, 张凯红, 赵宏生, 唐春和, 刘小雪. 一种石墨球磨损速率测量设备及操作方法: 中国, 201110159647.5, 2011-11-23, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201110159647.5.

杨阳, 赵宏生, 刘中国, 张凯红. 一种高抗热震性多孔碳化硅陶瓷的制备方法: 中国, 201010152549.4, 2010-08-18, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN201010152549.4.

赵宏生, 高竹子. 氮化铝/硼硅酸盐玻璃低温共烧陶瓷基板材料及其制备方法: 中国, 200710118465.7, 2008-01-09, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN200710118465.7.

时利民, 赵宏生, 唐春和, 闫迎辉, 梁彤祥. 一种制备高孔隙率多孔碳化硅陶瓷的方法: 中国, 200510076993.1, 2005-11-23, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN200510076993.1.

时利民, 赵宏生, 唐春和, 闫迎辉, 梁彤祥, 李自强. 一种SiC微米粉体的制备方法: 中国, 200410103488.7, 2005-07-13, http://www.wanfangdata.com.cn/details/detail.do?_type=patent&id=CN200410103488.7.