



## 个人简介：

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技术职务： 副教授 专业及学历： 化学工程 博士  
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## 工作及教育经历：

2012/09–至今， 天津工业大学  
2009/08–2012/08， 沙特阿卜杜拉国王科技大学(KAUST)，高等膜技术与孔材料研究中心，  
博士后  
2004/09–2009/07， 中科院大连化学物理研究所 硕博连读 化学工程 博士  
2000/09–2004/07， 大连理工大学 环境工程 学士

## 研究方向：

1. 气体膜分离技术：CO<sub>2</sub>、H<sub>2</sub>S 等酸性气体分离，有机蒸汽，O<sub>2</sub>/N<sub>2</sub> 分离以及 H<sub>2</sub> 分离膜等领域
2. 新型功能膜材料研究：聚酰亚胺、聚氧化乙烯以及高气体吸附内孔材料 PIMs 等气体膜材料

## 主持及参加的科研项目：

1. 国家自然科学基金青年项目，21506160，超分子轮烷构型聚酰亚胺-离子液体 CO<sub>2</sub> 分离膜的构筑与研究，**国家级，主持 已结题** 2015-2018
2. 天津市应用基础与前沿技术研究计划青年项目，14JCQNJC06400，新型热致微孔聚酰亚胺气体分离膜的设计与构建，**省部级，主持 已结题** 2014-2017
3. 教育部留学归国科研启动基金，48 批次，具有可控微孔的聚酰亚胺热重排气体分离膜的设计与构筑，**省部级，主持 已结题** 2015-2018

4. 天津工业大学分离膜与膜过程国家重点实验室开放基金, 螺环构型聚氧化乙烯气体分离膜的制备与研究, **校级, 主持 已结题** 2015-2016
5. 天津工业大学科研项目启动经费, Pebax 渗透汽化复合膜的制备及应用研究, **校级, 主持 已结题** 2012-2014
6. 国家自然科学基金面上项目, 21776217, 具有“无阻力”区域的聚合物/PEO 中空纳米微球混合基质膜构建及其 CO<sub>2</sub> 分离性能研究, **国家级, 第一参与**, 2018-2022
7. 国家自然科学基金面上项目, 51772208, 多孔金属氧化物复合及负载中空纤维膜湿式催化过氧化氢氧化去除水中难降解有机物及作用机制, **国家级, 第二参与**, 2018-2022
8. 聚四氟乙烯膜疏水性改性, **横向, 已结题, 第一参与人**, 2014-2015

### 代表性学术论文:

1. Xiaoli Ding, Fangfang Tan, **Hongyong Zhao\***, Mingming Hua, Mingxia Wang, Qingping Xin, Yuzhong Zhang, Enhancing gas permeation and separation performance of polymeric membrane by incorporating hollow polyamide nanoparticles with dense shell, Journal of Membrane Science, 570 (2019) 53-60 (SCI 一区)
2. **Hongyong Zhao**, Xiaoli Ding\*, Xiaolu Chen, Qian Xie, Yuzhong Zhang, Xiaoyao Tan, H<sub>2</sub>/CO<sub>2</sub> gas transport performance in poly (ethylene oxide) reverse-selective membrane with star-like structures, Journal of Wuhan University of Technology-Materials Science Edition, accepted. (SCI) 已接收 (2019), 暂未见刊
3. **Hongyong Zhao**, Lizhong Feng, Xiaoli Ding\*, Yun zhao, Xiaoyao Tian, Yuzhong Zhang, The nitrogen-doped porous carbons/PIM mixed-matrix membranes for CO<sub>2</sub> separation, Journal of Membrane Science, 564 (2018) 800-805 (SCI 一区)
4. **Hongyong Zhao**, Changyong Kang, Xiaoli Ding\*, Ran Wang, Xiaoyao Tan, Yuzhong Zhang, The effect of cross-linkers with multi-armed structures on gas transport properties in star-like poly(ethyleneoxide) polymers, Separation Science and Technology, 53 (2018)154-160 (SCI)
5. **Hongyong Zhao**, Lizhong Feng, Xiaoli Ding\*, Xiaoyao Tian, Yuzhong Zhang, Gas permeation properties of a metallic ion-cross-linked PIM-1 thin-film composite membrane supported on a UV-cross-linked porous substrate, Chinese Journal of Chemical Engineering, 2018 (<https://doi.org/10.1016/j.cjche.2018.03.009>) (SCI)
6. Xiaoli Ding\*, Mingming Hua, **Hongyong Zhao\***, Pingping Yang, Xiaolu Chen, Qingping Xin, Yuzhong Zhang, Poly(ethylene oxide) composite membrane synthesized by UV-initiated free radical photopolymerization for CO<sub>2</sub> separation, Journal of Membrane Science, 531(2017)129-

137 (SCI —☒)

7. **Hongyong Zhao\***, Qian Xie, Xiaoli Ding\*, Jiangming Chen, Mingming Hua, Xiaoyao Tian, Yuzhong Zhang. High performance post-modified polymers of intrinsic microporosity (PIM-1) membranes based on multivalent metal ions for gas separation, *Journal of Membrane Science*, 514(2016)305-312 (SCI —☒)
8. **Hongyong Zhao**, XiaoliDing\*, Pingping Yang, Lingyan Li, Xu Li, Yuzhong Zhang. A novel multi-armed and star-like poly (ethylene oxide) membrane for CO<sub>2</sub> separation, *Journal of Membrane Science*, 489 (2015)258-263 (SCI —☒)
9. XiaoliDing\*, Xu Li, **Hongyong Zhao\***, RanWang, Runqing Zhao, Hong Li, Yuzhong Zhang, Partial pore blockage and polymer chain rigidification phenomena in PEO/ZIF-8 mixed matrix membranes synthesized by insitu polymerization, *Chinese Journal of Chemical Engineering*, Doi:10.1016/j.cjche.2017.07.017 (SCI )
10. Xiaoli Ding\*, Zhiguang Liu, Xu Li, **Hongyong Zhao**, Mingming Hua, Yuzhong Zhang\*. Synthesis and performance of a novel nanofiltration membrane with a crosslinked sulfonated polysulfone separation layer, *Desalination and Water Treatment*, 57(2016)25960-25971 (SCI )
11. Xiaoli Ding, Yiming Cao\*, **Hongyong Zhao**, Lina Wang, Interfacial Morphology Between The Two Layers of The Dual-layer Asymmetric Hollow Fiber Membranes Fabricated by Co-extrusion and Dry-jet Wet-spinning Phase-inversion Techniques, *Journal of Membrane Science*, 2013, 444(1): 482-492 (SCI —☒)
12. **Hongyong. Zhao**, Yiming. Cao\*, Xiaoli. Ding, Meiqing. Zhou, Quan. Yuan, Poly (N,N-dimethylaminoethyl methacrylate)–poly(ethylene oxide) copolymer membranes for selective separation of CO<sub>2</sub>, *Journal of Membrane Science*. 310 (2008) 365–373. (SCI —☒)
13. **Hongyong. Zhao**, Yi-ming. Cao\*, Xiaoli. Ding, Meiqing. Zhou, Jian-hui. Liu, Quan. Yuan, Poly(ethylene oxide) induced cross-linking modification of Matrimid membranes for selective separation of CO<sub>2</sub>, *Journal of Membrane Science*. 320 (2008) 179–184. (SCI —☒)
14. **Hongyong. Zhao**, Yiming. Cao\*, Xiaoli. Ding, Meiqing. Zhou, Quan. Yuan, Effects of cross-linkers with different molecular weights in cross-linked Matrimid 5218 and test temperature on gas transport properties, *Journal of Membrane Science*. 323 (2008) 176–184. (SCI —☒)
15. Pengfei. Ji, Yiming. Cao\*, **Hongyong Zhao**, Guodong. Kang, Xingming. Jie, Dandan. Liu, Jianhui. Liu, Quan. Yuan, Preparation of hollow fiber poly(N,N-dimethylaminoethyl

methacrylate)-poly(ethylene glycol methyl ether methyl acrylate)/polysulfone composite membranes for CO<sub>2</sub>/N<sub>2</sub> separation, Journal of Membrane Science, 342 (2009) 190-197. (SCI 一区)

16. Guodong. Kang, Yiming. Cao\*, **Hongyong Zhao**, Quan. Yuan, Preparation and characterization of crosslinked poly(ethylene glycol) diacrylate membranes with excellent antifouling and solvent resistant properties, Journal of Membrane Science. 318 (2008) 227-232. (SCI 一区)
17. Xiaoli. Ding, Yiming. Cao\*, **Hongyong Zhao**, Lina. Wang, Quan. Yuan, Fabrication of high performance Matrimid/polysulfone dual-layer hollow fiber membranes for O<sub>2</sub>/N<sub>2</sub> separation, Journal of Membrane Science. 323 (2008) 352-361. (SCI 一区)
18. 康长勇; 丁晓莉; ; 王鑫兰; 张玉忠; 王丽娜, (#) (\*)赵红永基于聚合物中空微球构建膜内纳米空腔及其对气体渗透性能的影响, 高等学校化学学报, 2018, (12): 2820~2824
19. 陈凯迪, 赵红永, 谭小耀\*, 高透量聚二甲基硅氧烷 / 聚砜复合富氧膜制备. 膜科学与技术, 36 (2016) 86-92 (核心)
20. 杨平平, 丁晓莉\*, 赵红永, 华明明, 张玉忠, 王丽娜, 星形多臂 CO<sub>2</sub> 分离膜的制备及性能研究. 膜科学与技术, 36 (2016) 7-11 (核心)
21. 赵红永, 曹义鸣\*, 康国栋, 丁晓莉, 袁权, 聚氧化乙烯气体分离膜的发展. 膜科学与技术, 31 (2011): 18-24. (核心)
22. 丁晓莉, 曹义鸣\*, 赵红永, 介兴明, 王丽娜, 刘丹丹, 张玉忠, 袁权, 聚酰亚胺中空纤维气体分离膜的物理老化现象, 高校化学工程学报, 24 (2010)382-387 (EI)
23. 丁晓莉, 曹义鸣\*, 王丽娜, 赵红永, 介兴明, 袁权, 聚酰亚胺 6FDA-mPDA 及其非对称中空纤维膜的气体渗透性能, 高等学校化学学报, 30 (2009)1240-1244 (SCI)
24. 丁晓莉, 曹义鸣\*, 赵红永, 王丽娜, 袁权, Matrimid 5218/PSf 双层非对称中空纤维膜的制备及其气体分离性能研究, 高等学校化学学报, 29 (2008) 2074-2078 (SCI)

### 代表性专利:

1. 赵红永, 丁晓莉, 谭小耀, 裴建荣, 李娜, 一种具有超薄分离皮层的 PIM-1 气体分离复合膜的制备, ZL201310594847.2 (已授权)
2. 丁晓莉, 赵红永, 张玉忠, 一种具有星形网状结构的聚氧化乙烯 CO<sub>2</sub> 优先渗透分离膜, ZL201310594693.7. (已授权)

3. 纪妍妍, 赵博, 邓轩, 刘强, 李江, **赵红永**, 一种利用金属锡直接制备二氧化锡纳米颗粒的方法, ZL201510860093.X (已授权)
4. 丁晓莉, 李玲艳, **赵红永**, 张玉忠, 一种简便的集聚合物干燥及溶剂回收于一体的真空蒸馏装置, ZL201420041331.5 (已授权)