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【概述】

吴天昊，毕业于北京大学，获工学学士、经济学学士、理学博士学位，先后在美国油藏工程研究所、莱斯大学开展博士后研究工作。主要从事非常规能源开发和二氧化碳地质封存等领域的基础与应用基础研究，专注于多孔介质多场耦合过程的微观实验与模拟等方向。作为主要科研人员承担或参与国家自然科学基金委国际合作重点项目、联合基金重点项目，以及与美国艾克森美孚石油公司（ExxonMobil）、沙特阿美（Saudi Aramco）、卡塔尔北方石油公司（North Oil Company）等国际大型公司的合作项目；研究成果曾被行业顶级期刊 *Nano Energy* 选为封面文章，被 *Water Resources Research* 评为编辑亮点；受邀担任美国化学学会（ACS）石油基金项目评审专家；长期担任 *SPE Journal*、*Fuel*、*Computational Geosciences*、*Energy & Fuels*、*Journal Petroleum Science and Engineering*、*Journal of Natural Gas Science and Engineering* 等国际知名期刊审稿人。

【教育背景】

2010 – 2016：　博士，力学（能源动力与资源工程），北京大学
2006 – 2010：　学士，能源与资源工程、经济学（双学位），北京大学

【工作经历】

2023 – 现在：　东方理工高等研究院，工学部，副教授、副研究员
2022 – 2023：　东方理工高等研究院，工学部，助理教授、副研究员
2021 – 2022：　南方科技大学，环境科学与工程学院，研究副教授
2020 – 2021：　美国莱斯大学，化学与生物分子工程系，博士后
2017 – 2020：　美国油藏工程研究所，博士后
2016 – 2017：　北京大学，工学院，助理研究员

【研究领域】

课题组专注于多孔介质多场耦合过程的实验与模拟研究，主要面向非常规能源开发、二氧化碳地质封存中的工程难题，综合利用多尺度力学实验、微观渗流实验、多尺度成像、分子模拟、孔隙与岩心尺度数值模拟等方法，开展基础研究与应用基础研究，服务于国家能源战略，助力实现“双碳”目标。

【期刊论文】

1. **Wu, T.**, and A. Firoozabadi. 2022, Effect of fluids on the critical energy release rate of typical components in shale and andesite by molecular simulations, *The Journal of Chemical Physics*, 157: 044701.
2. **Wu, T.**, and A. Firoozabadi, 2021, Calculation of solid–fluid interfacial free energy with consideration of solid deformation by molecular dynamics simulations, *The Journal of Physical Chemistry A*, 125(26): 5841–5848.
3. **Wu, T.**, and A. Firoozabadi, 2021, Surfactant-enhanced spontaneous emulsification near the crude oil–water interface, *Langmuir*, 37(15): 4736–4743.

4. **Wu, T.**, J. Zhao, W. Zhang, and D. Zhang, 2020, Nanopore structure and nanomechanical properties of organic-rich terrestrial shale: An insight into technical issues for hydrocarbon production, *Nano Energy*, 69: 104426. (**Front Cover Article**)
5. **Wu, T.**, and A. Firoozabadi, 2020, Mechanical properties and failure envelope of kerogen matrix by molecular dynamics simulations, *The Journal of Physical Chemistry C*, 124(4): 2289–2294.
6. **Wu, T.**, and A. Firoozabadi, 2020, Fracture toughness and surface energy density of kerogen by molecular dynamics simulations in tensile failure, *The Journal of Physical Chemistry C*, 124(29): 15895–15901.
7. **Wu, T.**, D. Zhang, and X. Li, 2020, A radial differential pressure decay method with micro-plug samples for determining the apparent permeability of shale matrix, *Journal of Natural Gas Science and Engineering*, 74, 103126.
8. **Wu, T.**, and A. Firoozabadi, 2019, Effect of microstructural flexibility on methane flow in kerogen matrix by molecular dynamics simulations, *The Journal of Physical Chemistry C*, 123(17): 10874–10880.
9. **Wu, T.**[#], H. Zhao[#], S. Tesson, and A. Firoozabadi, 2019, Absolute adsorption of light hydrocarbons and carbon dioxide in shale rock and isolated kerogen, *Fuel*, 235: 855–867. ([#]Equal contribution)
10. **Wu, T.**, and A. Firoozabadi, 2018, Molecular simulation of binary gas mixture transport in slit nanopores, *The Journal of Physical Chemistry C*, 122(36): 20727–20735.
11. **Wu, T.**, X. Li, J. Zhao, and D. Zhang, 2017, Multiscale pore structure and its effect on gas transport in organic-rich shale. *Water Resources Research*, 53(7): 5438–5450. (**Editor's Highlight**)
12. **Wu, T.**, and D. Zhang, 2016, Impact of adsorption on gas transport in nanopores. *Scientific Reports*, *6,* 23629.
13. Yang, Y., J. Liu, J. Yao, J. Kou, Z. Li, **T. Wu**, K. Zhang, L. Zhang, and H. Sun, 2020, Adsorption behaviors of shale oil in kerogen slit by molecular simulation, *Chemical Engineering Journal*, 387, 124054.
14. Zhao, J., D. Zhang, **T. Wu**, H. Tang, Q. Xuan, Z. Jiang, and C. Dai, 2019, Multiscale approach for mechanical characterization of organic-rich shale and its application, *International Journal of Geomechanics*, 19(1), 04018180.
15. Zhao, H., **T. Wu**, and A. Firoozabadi, 2018, High pressure sorption of various hydrocarbons and carbon dioxide in Kimmeridge Blackstone and isolated kerogen, *Fuel*, 224, 412–423.
16. Zhang, D., T. Yang, **T. Wu**, X. Li, and J. Zhao, 2016, Recovery mechanisms and key issues in shale gas development. *Chinese Science Bulletin (in Chinese)*, 61(1), 62–71.

【会议论文】

1. **Wu, T.**, and A. Firoozabadi, Methane flow in shale nanopores with kerogen microstructure by molecular simulations, *SPE Annual Technical Conference & Exhibition*, SPE-191686-MS, Dallas, USA, September 24–26, 2018.
2. Zhang D., J. Zhao, **T. Wu**, H. Tang, Q. Xuan, and Z. Jiang, Multiscale approach to mechanical characterization of shale, *Sixth Biot Conference on Poromechanics*, Paris, France, July 9–13, 2017.
3. **Wu, T.**, Z. Jiang, and D. Zhang, A case study of fluid transport in shale crushed samples: Experiment and interpretation, *International Symposium of the Society of Core Analysts*, Avignon, France, September 8–12, 2014.