Assistant Professor LIANG, RUI

Department of Engneering Science, Faculty of Innovation Engineering
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Academic Qualification:

PhD in Civil Engineering, The Hong Kong University of Science and Technology, 2018
MPhi in Chemical and Biomolecular Engineering, The Hong Kong University of Science and Technology, 2014
MSc in Mechanical Engineering, The Hong Kong University of Science and Technology, 2012
B.E. in Inorganic Nonmetal Materials Engineering, Shandong University, China, 2010

Teaching Area

Mystery of Materials

Research Area

Organic/inorganic composite
Functional hydrogels enhanced by nanoparticles
Polymer-modified cementitious materials
High-strength lightweight construction materials

Working Experience

2022-now **Assistant Professor**, Department of Engineering Science, Faculty of Innovation Engineering, Macau University of Science and Technology

2021-2022 **Chief Technical Officer**, Advanced Materials R&D Center, Zhuhai UM Science & Technology Research Institute

2019-2021 **Postdoctoral Fellow**, Institute of Applied Physics and Materials Engineering, University of Macau

2017-2018 **Research Assistant**, Institute of Applied Physics and Materials Engineering, University of Macau

Academic Publication（selected）

[1] **Liang, R.**, Liu, Q., Hou, D.*, Li, Z., & Sun, G.* (2022). Flexural strength enhancement of cement paste throughmonomer incorporation and in situ bond formation. Cement and Concrete Research, 152, 106675.

[2] **Liang, R.**, Li, Z., Weng, L., Zhang, L., & Sun, G*. (2018). Recoverable hydrogel with high stretchability and toughness achieved by low-temperature hydration of Portland cement. Materials Chemistry Frontiers, 2, 2076-2080.

[3] Wu, G.#, **Liang, R.#** (**equal contribution**), Ge, M., Sun, G.*, Zhang, Y.*, & Xing, G.* (2022). Surface Passivation Using Two Dimensional Perovskites Towards Efficient and Stable Perovskite Solar Cells. Advanced Materials, 2105635.

[4] Ding, H., Liang, X., Xu, J., Tang, Z., Li, Z., **Liang, R.***, & Sun, G.* (2021). Hydrolyzed Hydrogels with Super Stretchability, High Strength, and Fast Self-Recovery for Flexible Sensors. ACS Applied Materials & Interfaces, 13(19),22774-22784.
[5] Tang, Z., Hu, X., Ding, H., Li, Z., **Liang, R.***, & Sun, G.* (2021). Villi-like poly (acrylic acid) based hydrogel adsorbent with fast and highly efficient methylene blue removing ability. Journal of Colloid and Interface Science,594,54-63.
[6] Huo, P., Ding, H., Tang, Z., Liang, X., Xu, J., Wang, M., **Liang, R.***, & Sun, G.* (2022). Conductive silk fibroin hydrogel with semi-interpenetrating network with high toughness and fast self-recovery for strain sensors. International Journal of Biological Macromolecules.
[7] Wang, M., Liang, L., Liu, Q., Liang, X., Guo, H., Li, Z., **Liang, R.***, & Sun, G.* (2022). Influence of dipotassium hydrogen phosphate on properties of magnesium potassium phosphate cement. Construction and Building Materials, 320, 126283.
[8] Guo, H., Tang, Z., Liu, Q., Xu, J., Wang, M., **Liang, R.***, & Sun, G.* (2021). Ultra-stable anti-washout cement grout achieved by super water absorbing villus-like nanocomposite hydrogel. Construction and Building Materials,301124035
[9] Liu, Q., Lu, Z., Hu, X., Chen, B., Li, Z., **Liang, R.***, & Sun, G.* (2021). A mechanical strong polymer-cement composite fabricated by in situ polymerization within the cement matrix. Journal of Building Engineering, 103048.
[10] Guo, H., Xu, J., Tang, Z., Liu, Q., Wang, M., **Liang, R.***, & Sun, G.* (2022). Effect of super water absorbing polymer based anti-washout admixtures on the properties of seawater-mixed cement paste. Materials and Structures, 55(2), 1-14.
[11] Wang, M., Liu, Q., Liang, X., Xu, J., Li, Z., **Liang, R.***, & Sun, G. (2022). Influence of Metakaolin on Properties of Magnesium Potassium Phosphate Cement with High Water-to-Solid Ratio. Journal of Materials in Civil Engineering, 34(9), 04022227.

Research Grants

China Postdoctoral Science Foundation（**2022M713666**）“Constructed matrix releases ultra-tiny nanoparticles to strengthen conductive nanocomposite hydrogels with high stretchability and low modulus”. **Principal Investigator**, 2022.
珠海市社会发展领域科技计划项目（**2220004000047**）“轻质高强纳米泡沫混凝土节能现浇回填技术的研 发”. **Principal Investigator**, 2022.
2022 FDCT-GDST Jointly Funding（**2022A0505030026**）
“相变微胶囊复合轻质高强纳米泡沫混凝土应用于建筑结构自保温材料及工程研究”. Principal Investigator, 2022.

Professional Certification and Awards

2022 年度澳門科學技術獎 技術發明獎三等獎 主要完成人（50%）

Professional Society Membership

Invited peer reviewer for:
Construction and Building Materials (Elsevier)
RSC Advances (Royal Soc Chemistry)