Frontier Chemistry Center
フロンティア化学教育研究センター

講演会

演 題：**Advances in Functional Thermoplastic Elastomers to Meet Contemporary Needs**

講 師：**Prof. Richard J. Spontak**
North Carolina State University, the U.S.A.

日 時：2023 年 2 月 10 日（金）15:30~16:30

場 所：フロンティア応用科学研究棟　1 階セミナー室 1

要 旨：

Numerous designer polymers have been developed to address the growing number of needs in all technological areas. We pose the question, “Can one technology platform be made sufficiently versatile and robust so that it can significantly benefit many, but certainly not all, of society’s needs?” For this purpose, we elected to use thermoplastic elastomers, a class of self-networking macromolecules that are currently used in many commodity applications. In other words, these materials are abundantly available, and new ones are being synthesized from sustainable sources. Because of their innate ability to form networks and impart elasticity, we can exploit their mechanical properties while functionalizing them for specific applications. Here, several of these applications will be addressed, ranging from tunable compatibilizers and rubber-toughening agents in blends to stimuli-responsive standalone materials. Of particular interest in this vein are gas-separation membranes for removing basic (NH_3) and acid (CO_2) gases from gas mixtures [1], solar cells that can be designed to mimic leaves [2] or function as dye-sensitized devices [3], and antimicrobial materials that can kill (to 99.9999+%) Gram-positive/negative bacteria, viruses (including SARS-CoV-2) and mold in ~5 min [4,5].

[1] Dai, Z., *et al*., *NPG Asia Mater.*, **11**, 53 (2019).
[2] Al-Mohsin, H.A., *et al*., *Adv. Energy Mater*., **5**, 1401941 (2015).
[3] Al-Mohsin, H.A., *et al*., *Sol. RRL*, **2**, 1700145 (2018).
[4] Peddinti, B.S.T., *et al*., *Mater. Horiz*., **6**, 2056 (2019).
[5] Peddinti, B.S.T., *et al*., *Adv. Sci.*, **8**, 2003503 (2021).

主 催：北海道大学工学研究院 フロンティア化学教育研究センター

共 催：北大創成特定研究事業
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