Human Interactive Materials (HIM) **TU/e**

Developing (semi-) conductive liquid crystal elastomer toward an autonomous robot

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Introduction

In nature, the generation, transmission, and processing of electrical signals are common forms to control the action of plants and animals, such as the reflex arc in the human body, the sequential actuation of mimosa, and so on. The feedback system, consisting of the sensing, processing, and actuating unit, endows the animals and plants with autonomous behaviors.

Project summary

In this project, we plan to develop the (semi-) conductive liquid crystal elastomer, which can be used as both an actuating element and sensing element. It will be activated by deformation lts will electricity. be monitored simultaneously. Figures on the right show this concept. Currently, we use the ionic liquid as a medium for conducting electricity.

The next step is to use new conducting liquid crystal polymers to assemble devices with specific functions, such as grasping objects.

[1] Stolarz, et al. Physiologia Plantarum 173.4 (2021): 1882-1888.

Project goals

- Develop (semi-) conductive (liquid crystal) materials
- Integrate the materials into an autonomous soft robot
- Analyze robotic functions

Contact information

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CHEMICAL ENGINEERING AND CHEMISTRY

Mimosa generates and transmits action potentials after being stimulated^{[1].}





