International Webinar on Gels and Networks

Shingo Matsukawa – Professor

Tokyo University of Marine Science and Technology, Tokyo, Japan
matsukaw@kaiyodai.ac.jp

Network structures of polysaccharide gels from viewpoints of microscopic and macroscopic aspects

ABSTRACT: Macroscopic measurements on physical properties of food hydrocolloids provide useful information about formation of networks and network structures. For a deeper understanding, measurements of microscopic properties are instructive to give insights into mobilities and structures in nano and molecular levels. NMR measurements gives the information of molecular mobility, that is, relaxation times of polysaccharide reflect the flexibility of chains and relaxation times for water reflect the motion of water molecules and also polysaccharide chains through the chemical exchanging between water proton and labile proton on the chains. Moreover, the diffusion coefficients of probe polymers give the information about the mobility of molecules and the structure of the hydrocolloids. Furthermore, nano-particle tracking provides information on the local viscoelasticity of polysaccharide gels. The diffusion of particles by the Brownian forces can be used to probe the spatial heterogeneity of physical properties during the gelation, which gives the information about the phase separated structures in mixed polysaccharides gels. The results were supported by a simulation about a simulation of particles diffusion considering the heterogeneity of the gels.

GOALS:

- Understand the relationship between macroscopic physical properties and molecular mobilities
- Learn about the technique to measure the molecular mobility
- Learn about simulation of particle diffusion in heterogeneous media

ABOUT THE WEBINAR:

Due to the ongoing global crisis involving COVID-19, there is little chance for the soft matter community to meet to learn about gels and networks. We propose this seminar as a way for members of the European and Asian communities to share our research and learn from each other, even when social distancing is necessary. The tone of this webinar is informal, and questions can be freely asked at any time. We welcome open discussion, and hope that all who attend will learn a lot!

Webinar website: http://www.fp.a.u-tokyo.ac.jp/lab/sozai/seminar.html

Registration:
https://u-tokyo-ac-jp.zoom.us/meeting/register/tZMtd-2urj0oHNOv6GBnwKjIKUzkPDAbvugY

Date: Wednesday, May 12th, 2021
Time: 17:00-18:30 JST, 10:00-11:30 CET
Cost: Free

Organizers:
Daniel King (Hokkaido University)
Koichi Mayumi (University of Tokyo)
Tetsuo Yamaguchi (University of Tokyo)
Tetsuharu Narita (ESPCI Paris)