

Polymer Seminar

Monday, November 25, 2024

11:15 am Science 1 - Room 1002

Coffee, Tea, and Cookies will be available at 11:00 am



Dr. Atsushi Takahara

Research Center for Negative
Emission Technologies
Kyushu University

Environmental Degradation and Microplastic Formation of Polymeric Solids

Abstract: Plastic fragments smaller than 5 mm are classified as microplastics (MPs). They pollute natural ecosystems through various sources, including cosmetics, clothing, food packaging, and industrial activities. MPs have a significant negative impact on the environment. To mitigate this issue, it is crucial to adopt a scientific approach to better understand the formation process of MPs. In this presentation, we outline three common degradation mechanisms of polymeric solids from a surface chemistry standpoint: chemical degradation, biodegradation, and mechanical degradation. These processes can occur consecutively or simultaneously in poorly managed polymeric materials, eventually leading to their breakdown and release into the environment. This presentation offers valuable insights into controlling the degradation of polymeric solids and developing eco-friendly polymers to promote a sustainable future

Biography: Atsushi Takahara earned his D.Eng. (1983) in the field of polymer science from Kyushu University. He was a full professor of Kyushu University from 1999 to 2021. He has been a project leader of JST/ERATO Takahara Soft Interfaces Project (2008-2014), a director of Institute for Materials Chemistry and Engineering, Kyushu University (2013-2017). He is currently a senior editor of *Langmuir* (2016-). He received several awards including Polymer Science Award (2003), Rheology Award (2013), APS Fellow (2014), ACS Fluoropolymer 3M Award(2014), RSC Fellow(2016), SPSJ Award for Outstanding Achievement on Polymer Science and Technology(2018), Neutron Science Award(2020), and Award for Outstanding Achievement on Adhesion Science and Technology(2024). He was a president of Society of Polymer Science (2014-2016) and a president of Materials Research Society, Japan (2017-2019). He has published more than 640 peer reviewed papers. His research interests are focused on advanced soft material science such as polymer surface and interface, polymer nanocomposites, polymer degradation and stability, and quantum beam science applied to soft matter.