

74th SUGA ACADEMIC SEMINAR: WEATHERING PROGRAM 2023

Time	Date: November 22, 2023 (Wed) Location: Nomura Conference Plaza Nihonbashi (face-to-face and live-streaming)
10:30 – 10:35	Opening remarks by Shigeo Suga, Director-General, Suga Weathering Technology Foundation
[1] 10:35 – 11:15	Elucidation of corrosion mechanisms and improvement of corrosion resistance of infrastructural materials by using hyperbaric-oxygen accelerated corrosion test Kotaro Doi Independent scientist, National Institute for Materials Science
[2] 11:20 – 12:00	Quantitative assessment of tensile strength and degradation coefficient of m-Aramid/p-Aramid blended yarns used for outer layers of firefighter clothing under ultraviolet light and correlation with fabrics data Kaoru Wakatsuki Professor, Mechanical Engineering and Robotics Division, Research Center for Personal Protection & High-Performance Textile, Faculty of Textile Science and Technology, Shinshu University
	Lunch
[3] 13:00 – 14:00	Conservation and Prevention of Deterioration of Mongolian Sunken Ships Using Trehalose Setsuo Imazu University president, Nara University
[3] 14:05 – 14:45	Development of Monitoring Method for Corrosion Environment of Steel Rebar in Concrete and its Applications Masayuki Itagaki Professor, Department of Pure and Applied Chemistry, Tokyo University of Science
	Break
[5] 15:00 – 15:40	Numerical and experimental investigation of stress corrosion cracking occurring in metallic materials Tomoyuki Fujii Associate professor, Course of Intelligent Processing and Materials Engineering, Shizuoka University
[6] 15:45 – 16:15	Comparison of accelerated lightfastness test for plastics using white LED lamp and xenon-arc lamp Hideo Kita General Manager, Calibration Department, Suga Test Instruments Co., Ltd.
16:15 – 16:20	Closing remarks by Satoshi Ito, Councilor, Suga Weathering Technology Foundation

[1] Kotaro Doi

Corrosion of reinforcing bars in concrete is rate-limited by the oxygen reduction reaction. We have developed a new accelerated corrosion test method (hyperbaric-oxygen accelerated corrosion test), in which the oxygen reduction reaction is enhanced, and the corrosion of metallic materials and improvement of corrosion resistance are enabled. In this presentation, we will give an overview of the hyperbaric-oxygen accelerated corrosion test and report on the results of our research using the hyperbaric-oxygen accelerated corrosion test.

[2] Kaoru Wakatsuki

This study investigated the degradation of tensile strength of aramid spun yarns and fabrics used in firefighter clothing in response to UV exposure energy, focusing on the m-Aramid/p-Aramid blend ratio and obtaining a mathematical model to calculate tensile strength from arbitrary UV exposure energies. The comparison of the degradation coefficients of tensile strength of yarns and fabrics in response to UV light and the establishment of a prediction method based on the correlation between them will allow efficient design and prediction of degradation of high-performance textiles at costly inexpensive and timely efficiency.

[3] Setsuo Imazu

Sunken ships discovered at the bottom of the sea are called "time capsules of the sea. In Japan, a wreck of the Genko pirates was discovered on the seabed of Takashima Island in Matsuura City, Nagasaki Prefecture. Takashima was the site of the end of the Kouan War (1281), in which 4,400 warships and a Mongol army of 140,000 men collapsed in one night. Conservation of sunken shipwrecks has developed in Europe, but it faces problems such as long conservation periods, huge costs, and deterioration after conservation treatment. We are challenging the conservation of sunken ships using trehalose, which is safe and environmentally friendly, and are promoting its use around the world.

[4] Masayuki Itagaki

Precise analytical method for corrosion environment of steel rebar in concrete has been developed. Impedance sensor with probe electrodes which are made of same material as rebar allows concrete resistance and charge transfer resistance of rebar/concrete interface. This method has been applied to corrosion environment monitoring at highway, railway pier, bridge, etc. Furthermore, corrosion mechanisms of rebar in concrete have been studied on the basis of corrosion monitoring.

[5] Tomoyuki Fujii

Stress corrosion cracking, SCC, is a phenomenon in which crack-like localized corrosion occurs under certain conditions of material, environment, and tensile stress. SCC is a problem because SCC occurs in various alloys, especially in highly corrosion-resistant metals such as stainless steel. In this presentation, the Monte Carlo simulation for the life evaluation of SCC in stainless steel, SUS304, will be demonstrated. Then, our recent study of SCC initiation in aluminum alloys will also be presented.

[6] Hideo Kita

Recently, white LED lamp is widely used for indoor lighting, and printed materials and plastic products such are exposed to white LED lamp. White LED lamps emit no ultraviolet radiation and were generally thought not to cause degradation, but in fact, degradation occurs when exposed to white LED lamp. Therefore, standards for lightfastness tests using white LED lamp are being developed in the groups of printing and plastics. This study is a of accelerated lightfastness test for plastics using white LED lamp and xenon-arc lamp through a window glass, which is a general indoor light resistance test method.