

## The 53rd Symposium on Powder Technology

The 53rd Symposium on Powder Technology organized by Hosokawa Powder Technology Foundation took place at Hotel Nikko Osaka, in Japan on Monday, October 7, 2019. It was held by the planning of Council of Powder Technology, Japan and with the sponsorship of Hosokawa Micron Corporation. Nearly 180 people from the industries and universities attended this symposium. The theme of the symposium this year was “Forefront of Fundamentals and Applications of Advanced Powder Processing”. There were six lectures including a special one given by the KONA Awardee with questions and answers after each lecture followed by a get-acquainted party for further free discussions.

At the beginning of the symposium, Mr. Yoshio Hosokawa, the president of the Foundation, gave the opening address mentioning that this symposium was started in 1968, more than 50 years ago and has been continued almost annually since then. Prior to the lectures, the KONA Award presentation ceremony was held and the plaque of KONA Award was handed from the president to Prof. Mojtaba Ghadiri, who received this Award in the last fiscal year 2018. The KONA Award has been given to the researcher with excellent performance and contributions to the powder and particle science and technology since 1990. It was first started by Hosokawa Micron Corporation but taken over by Hosokawa Foundation after its establishment in 1991. Though it had been presented to Japanese researchers by the Foundation till three years ago, it was opened to worldwide and given to the overseas researcher by the Foundation two years ago for the first time.

In the special lecture given by Prof. Ghadiri, a critique of the current state of the art in rheometry of cohesive powder flow was presented, reviewing features of a number of instruments widely used for the evaluation of the cohesive powder flow, which is reviewed in this issue of the journal.

The contents of the symposium are shown below. In the second lecture was presented the way of thinking to use the technique of reducing spring constant to reduce the calculation time or cost for the Discrete Element Method (DEM), which is one of the most popular simulation methods widely used to study the phenomena concerning granular materials or powders or to develop and optimize granular facilities and processes.

The following lecture 3 was concerning the methodology for designing nanoparticles which was summarized based on two mixing concepts of rapid mixing and precise diffusion control. The synthesis of TiO<sub>2</sub> nanoparticles by double-tube microreactor developed and the K-M mixer as a typical micro mixer for strict control of nucleation process was introduced together with its performance on the processing of nanoparticles.

In the lecture 4, the results of the study of mechanism of the biomineralogical processing which improved the gold recovery from 25 % to finally 92 % using the differential thermogravimetric analysis and quantitative evaluation of minerals with scanning electron microscopy were introduced.

In the lecture 5, the mechanism for high viscosity of the sealant and adhesives in which the calcium carbonate particles are dispersed was explained on the measurement of the viscosity of confined liquid plasticizer between the surfaces imitating the particle surface of calcium carbonate using shear resonance measurement system.

In the final lecture, along with the history of the machines for spheronization of natural graphite particles used as the negative electrode of the LIB secondary battery to improve its energy density and their working mechanisms, a new phenomenon model was introduced and elucidated.



KONA Award presentation ceremony

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**Theme:** “Forefront of Fundamentals and Applications of Advanced Powder Processing”

**Date:** Monday, October 7, 2019 **Place:** Hotel Nikko Osaka (Tel 81-6-6244-1111)

**Opening address** Mr. Yoshio Hosokawa (*President of Hosokawa Powder Technology Foundation, President of Hosokawa Micron Corporation*)

- 2018 KONA Award presentation ceremony

**Session 1** Chaired by Prof. Makio Naito (*Osaka University*)

- Lecture 1 (Special lecture by the KONA Awardee)  
“Rheometry of Cohesive Powder Flow”  
Prof. Mojtaba Ghadiri (*University of Leeds, UK*)
- Lecture 2  
“Recent Topics in the DEM Simulation of Granular Flow”  
Prof. Toshitsugu Tanaka (*Osaka University*)

**Session 2** Chaired by Emeritus Prof. Ko Higashitani (*Kyoto University*)

- Lecture 3  
“Production of Fine Particle Materials with High Performance by Microreactor”  
Prof. Kazuhiro Mae (*Kyoto University*)
- Lecture 4  
“Biomaterial Processing of Graphitic Refractory Gold Ores Using Enzymatic Reactions”  
Prof. Keiko Sasaki (*Kyushu University*)

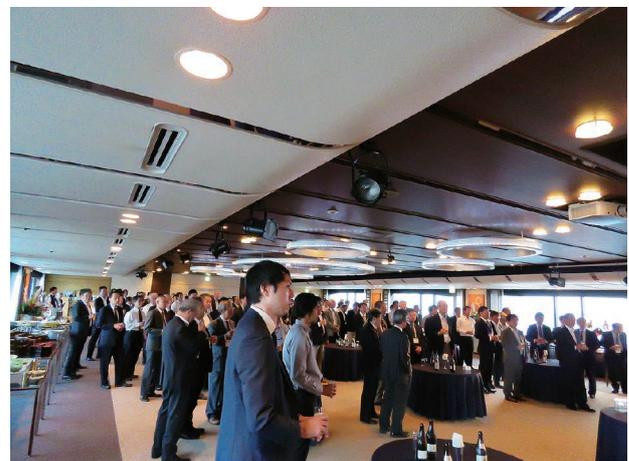
**Session 3** Chaired by Prof. Satoru Watano (*Osaka Prefecture University*)

- Lecture 5  
“Controlling Surface Modification of Calcium Carbonate Filler and Characteristic of Its Composite Material”  
Dr. Yoshisada Kayano (*General Manager, Shiraishi Kogyo Kaisha, Ltd.; Director, Shiraishi Central Laboratories Co., Ltd., Japan*)
- Lecture 6  
“Challenging History to Spheronize Natural Graphite for Secondary Battery”  
Dr. Kohei Hosokawa (*Executive Vice President, Business Management, Hosokawa Micron Corporation, Japan*)

**Closing remarks** Emeritus Prof. Fumio Saito (*Tohoku University, President of Council of Powder Technology, Japan*)



Symposium on Powder Technology



Get-acquainted Party