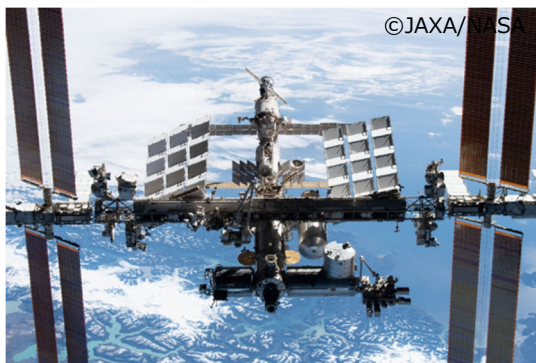


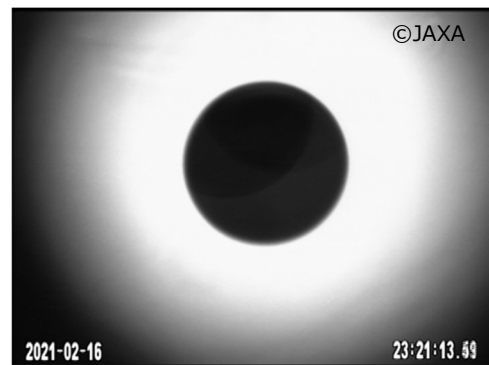
AGC Succeeds in World's First Measurement of Physical Properties of Molten Gallium Oxide on the International Space Station

— Further accelerating the practical application of gallium oxide wafers —

Tokyo, March 24, 2022 - AGC Inc. (AGC), a world-leading manufacturer of glass, chemicals and high-tech materials, has successfully measured physical properties of molten gallium oxide, a material with a high melting point, for the first time in the world *¹ on the Japanese Experiment Module "Kibo" of the International Space Station using an electrostatic levitation furnace (ELF)*² owned by Japan Aerospace Exploration Agency (JAXA).



Japanese Experiment Module "Kibo" of the
International Space Station



Measurement of physical properties of molten
gallium oxide (during melting)

Power semiconductor devices are electronic components used to control electric power in a wide range of electric and electronic devices such as servers, automobiles, industrial machinery, and home appliances. Gallium oxide is attracting a great deal of attention as a next-generation power semiconductor material because it has less power loss than silicon, a conventional power semiconductor material, and has the potential for high-voltage and high-current applications. AGC has been focusing on the potential of gallium oxide and has been collaborating with Novel Crystal Technology, Inc. since 2018. Physical properties of molten gallium oxide are essential parameters for numerical simulation of growth processes of gallium oxide single crystals but have hardly been studied so far due to its high melting point of approximately 1,800°C. In this high-temperature regime, the molten gallium oxide can be contaminated by the crucible when measuring the physical properties using conventional methods, which makes it challenging to measure them accurately.

<Media inquiries>

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*Personal information is handled in accordance with our Privacy Policy

The electrostatic levitation furnace (ELF) ^{*2} owned by JAXA enables measurements of physical properties of high-melting-point materials by levitating samples in a weightless condition and melting them with a laser instead of using a crucible. In this experiment, AGC succeeded for the first time in the world ^{*1} in obtaining physical properties of molten gallium oxide such as viscosity and surface tension, in addition to density of molten gallium oxide over a wide temperature range including the melting point. In the future, numerical simulations will be performed using these data to accelerate technological development toward higher quality and larger diameter gallium oxide single-crystal substrates, as well as to further improve manufacturing yields. The results of this experiment will be presented at the 69th Japan Society of Applied Physics Spring Meeting 2022.

Under its **AGC plus-2023** medium-term management plan, the AGC Group has positioned Electronics as one of its strategic businesses. AGC will continue making aggressive development efforts and investment in semiconductor-related business, which is expected to continue to show significant growth in demand, and thus contribute to the advancement of the semiconductor industry.

^{*1} According to AGC research

^{*2} Please refer to the following URL for further information on JAXA's ELF.

<https://iss.jaxa.jp/en/kiboexp/pm/elf/>

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< Reference >

■Outline of the presentation

1. Conference The 69th JSAP Spring Meeting 2022
name
2. Presentation Physical Properties of Molten Ga_2O_3 Measured with an Electrostatic
subject Levitation Furnace in the International Space Station-KIBO
3. Location Sagamihara Campus, Aoyama Gakuin University & Online (Hybrid format)
4. Dates March 22 (Tue.) – 26 (Sat.), 2022
5. URL [The 69th Japan Society of Applied Physics Spring Meeting
\(https://meeting.jsap.or.jp/english\)](https://meeting.jsap.or.jp/english)

■Related releases

March 22, 2018

[AGC Invests in Next-generation Power Semiconductor Material Developer Novel Crystal Technology](#)

June 30, 2020

[AGC Increases Investment in Next-generation Power Semiconductor Material Developer Novel Crystal Technology](#)

February 21, 2022

[AGC Increases Investment in Next-generation Power Semiconductor Material Developer Novel Crystal Technology](#)

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