

Integrated Research Center for Sustainable Energy and Materials

[Materials and Energy for Future Generations]

Established in April 2016 for a five-year period.

Director: Toru H. OKABE

<http://susmat.iis.u-tokyo.ac.jp/english/about.html>

Integration of materials engineering and energy engineering for realizing a sustainable society

This center was established in April 2016 to propose tactics to achieve the goal of a sustainable society in terms of “energy and materials”. This center collaborates closely with companies and endowed research units, such as the Endowed Research Unit for Non-Ferrous Metal Resource Recovery Engineering (JX Metals Endowed Unit), in Japan as well as abroad in order to conduct research on the following topics in the field of metal, inorganic, and organic materials:

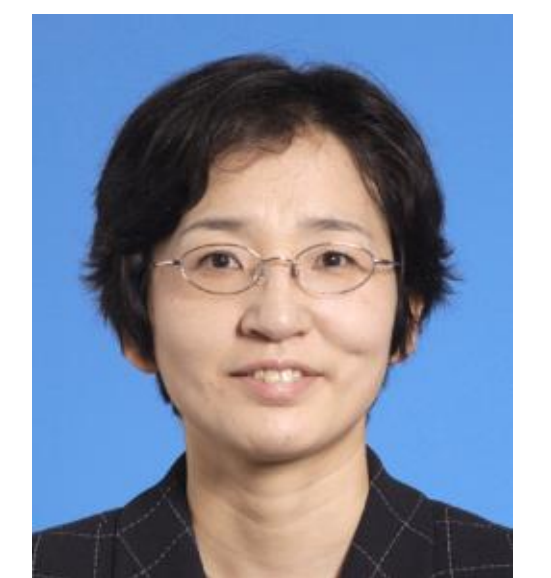
- Developing processes to efficiently utilize energy and resources.
- Inspecting the recycling processes of industrially important materials and their byproducts.
- Developing materials production processes and the corresponding disposal processes.
- Developing new materials and systems with low environmental loads.

Director



T. H. Okabe,
Prof.

Deputy Director



N. Yoshie,
Prof.



M. Maeda,
Prof.



H. Inoue,
Prof.



K. Edagawa,
Prof.



T. Yoshikawa
Associate Prof.



S. Yagi,
Associate Prof.



Y. Hoshi,
Lecturer



S. Owada,
Visiting Prof.



K. Yamaguchi,
Visiting Prof.



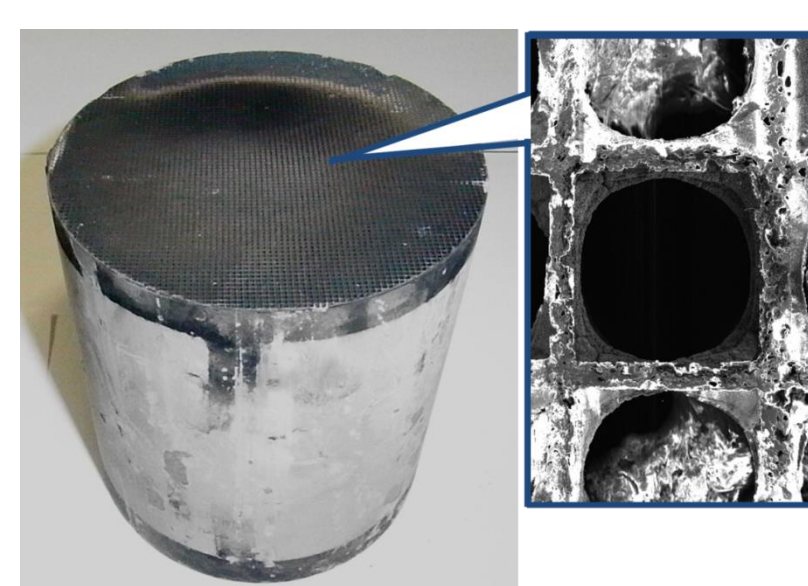
A. Shibayama,
Visiting Prof.

Research topics

Resources/Materials Flow and Recycling Division:

– Design of Resources/Substances/Materials Flow and Control of Process –

- Process development based on international material flow
- Analysis of occurrence, immobility, and recycling of hazardous substances
- Development of recycling processes for exhaustible resources
- Improvement of production technologies for fundamental materials

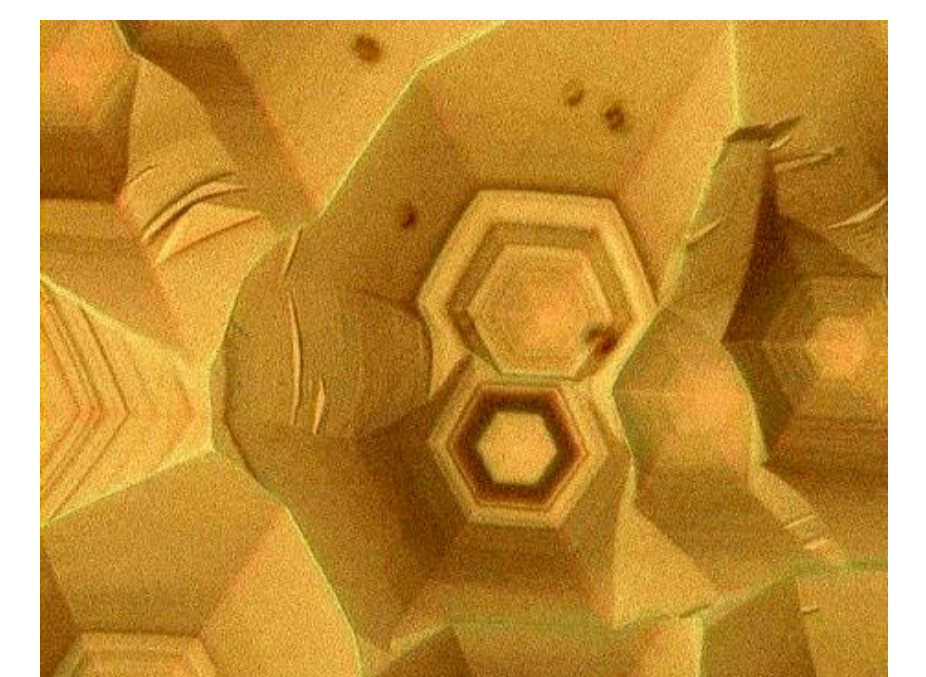


Recovery of PGMs
from auto scraps

Effective Utilization of Energy/Resources Division:

– Base Engineering for Society of Low Energy Consumption –

- Solution growth of eco-semiconductor SiC and AlN using alloy solvent
- Modeling of extra-long-term supply and demand of resources
- Determining the environmental-impact indicators of mining development



Direct observation of high-temp.
interface during crystal growth

Advanced Substances/Materials Design Division:

– Energy/Materials Engineering for Maximized Utilization of Resources/Substances –

- Development of polymers and glasses with reduced environmental load and of chemical technologies for biomass utilization
- Mechanical properties of environmentally sound materials
- Development of novel high-efficiency thermoelectric materials

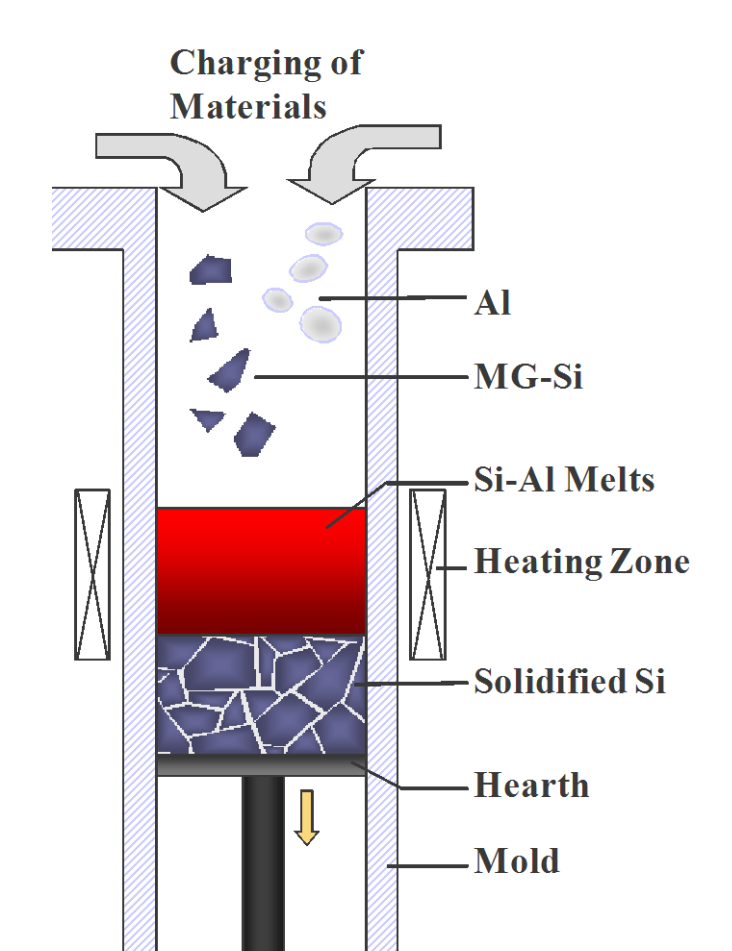


Melting of simulated waste
borosilicate glass

Promotion of Social Implementation Division:

– Strong Cooperation with Industry –

- Development of ultra-long-life materials
- Atomistic optimization for extending materials life
- Optimization of waste treatment of huge amounts of structural materials
- Establishment of recycling technology and system for valuable materials
- Development of optoelectronic devices with van der Waals heterostructures



Solidification refining process
for solar-grade Si