

IRCSEM

INOUE LAB.

[Crystallization of Glass for Novel Functional Materials]



Research Center for Sustainable Material Energy Integration

Amorphous Materials Design

Department of Materials Engineering

<http://www.vitreous.iis.u-tokyo.ac.jp>

「Material Design and Crystallization of Amorphous States」

We study the materials from an amorphous state to a liquid state. Atomic and electronic structures of the amorphous and liquid states have not been well understood. We study the method in order to understand these materials, and apply it to a variety of materials. Moreover we will produce novel materials and their applications. Recently we also focused on the luminescence property of Crystallization of glasses.

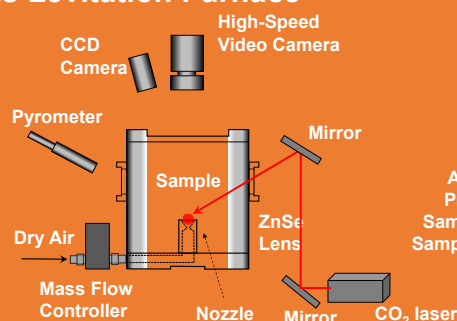
◇ Glasses prepared by gas levitation furnace and their structure

- High Refractive Index & Low Dispersion Glass
- High Elastic Modulus Glass
- High Strength Glass

Structure Analyses of glasses

- X-ray Diffraction with Synchrotron Radiation
- Solid-State NMR Spectroscopy
- Atomistic Structural & modeling

Gas Levitation Furnace



Levitated gases:
Air, Oxygen, Nitrogen
Pressure: 1 ~ 3 atom
Sample size: $f = 1 \sim 5$ mm
Sample weight: 10 ~ 200 mg

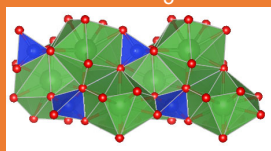
◇ Luminescence Properties of Glass-Ceramics

- Emission Controlling of Ni ions in glasses by Crystallization
- Emission Color Tuning by Crystallinity of glasses

◇ Chirality with Glass-Ceramics

- Emission from Chiral Inorganic Crystals

$\text{LaBSiO}_5: \text{Ln}$



Circularly Polarized light