

NAKAMURA LAB.

-Establishment of Sustainable Society from coupling Technology and social system-

International Research Center for Sustainable Materials

Metallurgy and Recycling System for Metal Resources Circulation

Coupling Technology and social system

Our aim is to develop the process technologies and social systems for metal recycling, waste detoxification and energy recovery based on the nonferrous metal smelting industries.



Our laboratory covers very wide topics and view from **km(Mineral Resources)** to **nm (nano-technologies)**



Earth View from artificial satellite

Typical Open Mining of Copper

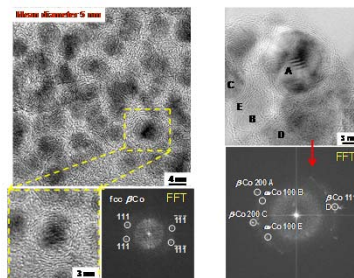


Cu content becomes less 1% in Copper ore. Then, we have a large Amount of Ecological Ruckus to get Primary Resources And Short supply of mineral resources is uncertain in future



We need many Metals for High Technology Products

HRTEM Photos of Co nano carbon Capsules for a new catalysis



Social System Development
Reserve (of Waste) to Stock Project

Aims of Project : **Artificial Mineral Deposit**

- Metal Resource Reservation including Rare Metals
- Management of Harmful Metals contains in the WEEE
- Circulation in Asian Block prevent environmental impacts

The definition of resources is "a certain amount of substance with a fixed quality." In many cases, WEEE has a fixed quality, but it is difficult to collect a certain amount.

Introducing the concept of "Accumulation", we are aiming the realization of "Resource circulation".

Our present Other Research themes

- Thermal and hydro processing for wastes treatment and recycling (Chemical Thermodynamics)
- New solution plasma process to synthesize metal-carbon nanocomposites (Environmental Catalyst)
- Physicochemical properties and thermodynamics of unintentional POPs (Persistent Organic Pollutants) from industries
- Innovative processes of physical separation and washing technology using microbubbles and ultrasound
- Development a Novel processing for Rare Metals Recycling