

OWADA LAB.

[Smart Recycling]

Integrated Research Centre for Sustainable Energy and Materials
Institute of Industrial Science

Materials Separation and Recycling Engineering

Smart Recycling

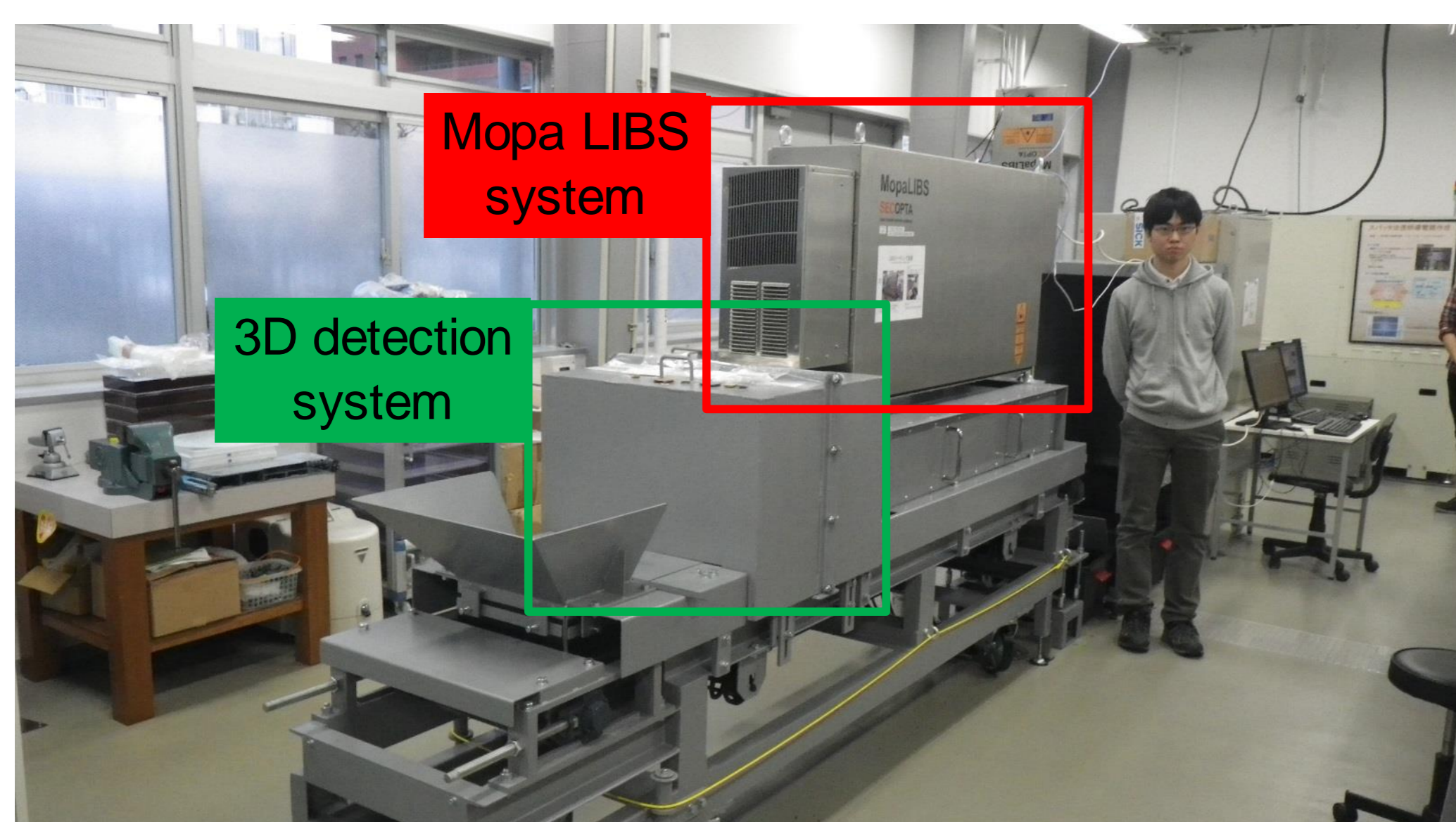
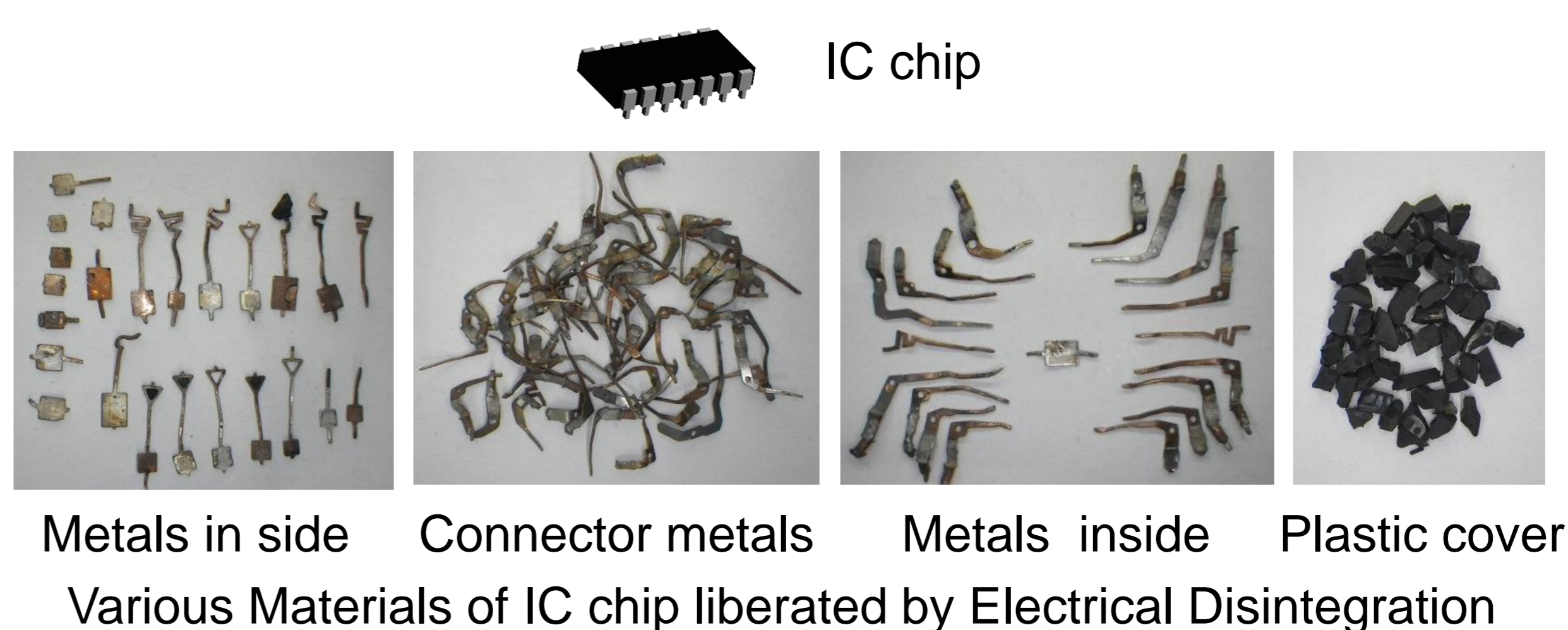
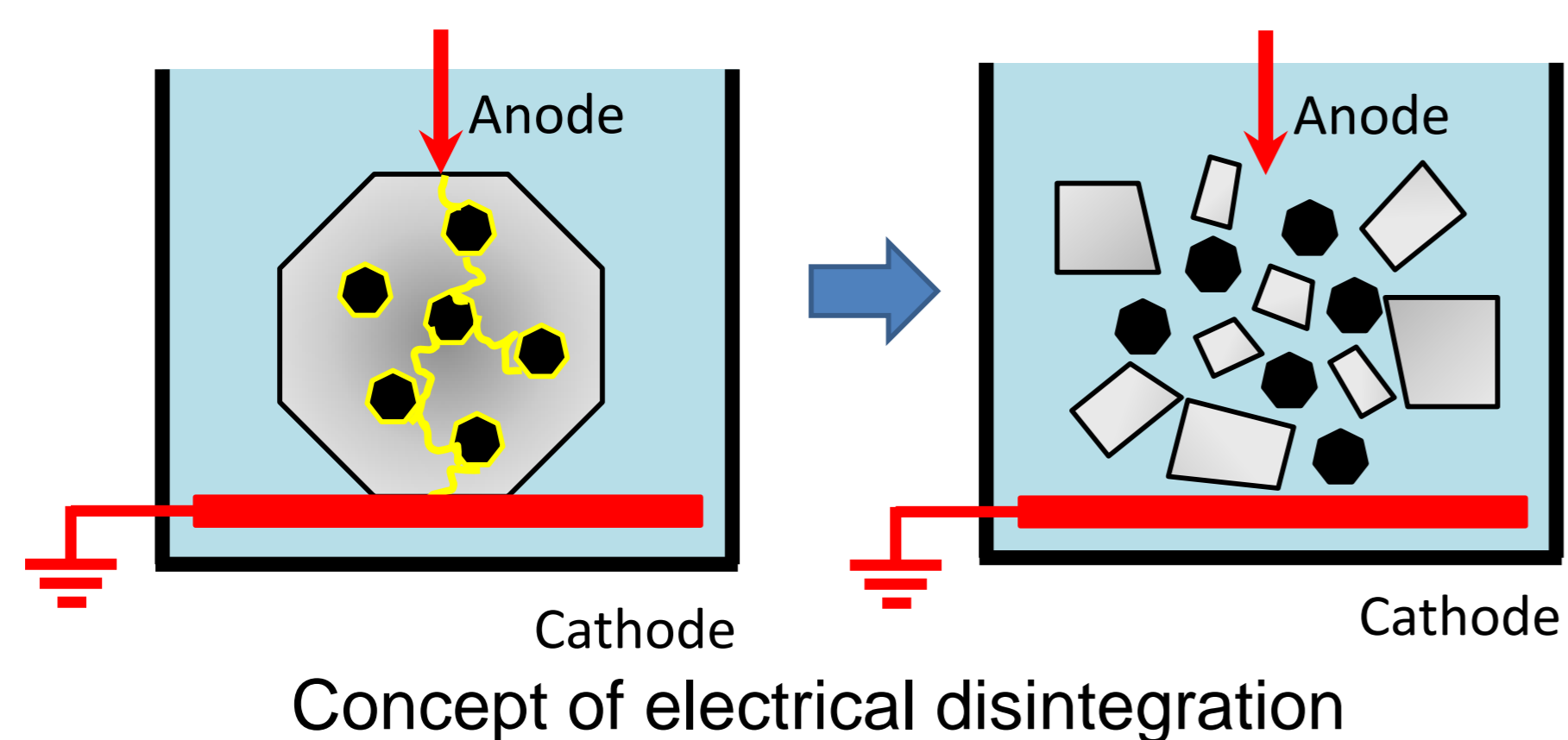
Smart Comminution and Separation

Since valuable and useless components are mixed in natural and artificial (waste) resources, it is necessary to recover the former elements and to reject or appropriately treat the latter ones. Key technology of solid–solid separation, in other words **“SOFT SEPARATION”**, should be applied with high efficiency and high reliability. In order to achieve the above separation, the following two kinds of technological development is essential.

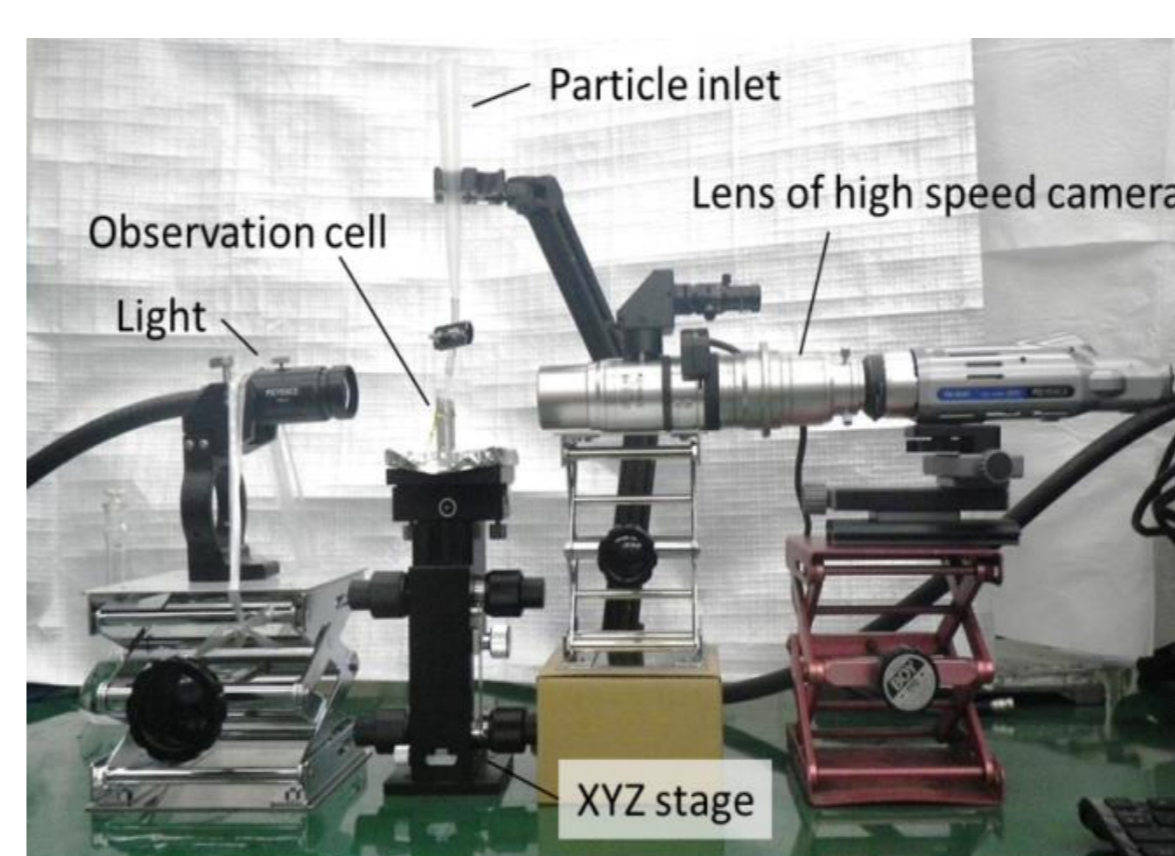
1. **Intelligent Comminution** to make good liberation of componential elements
2. **Intelligent Separation** of compositional elements with high energy efficiency

Followings are examples of research topics.

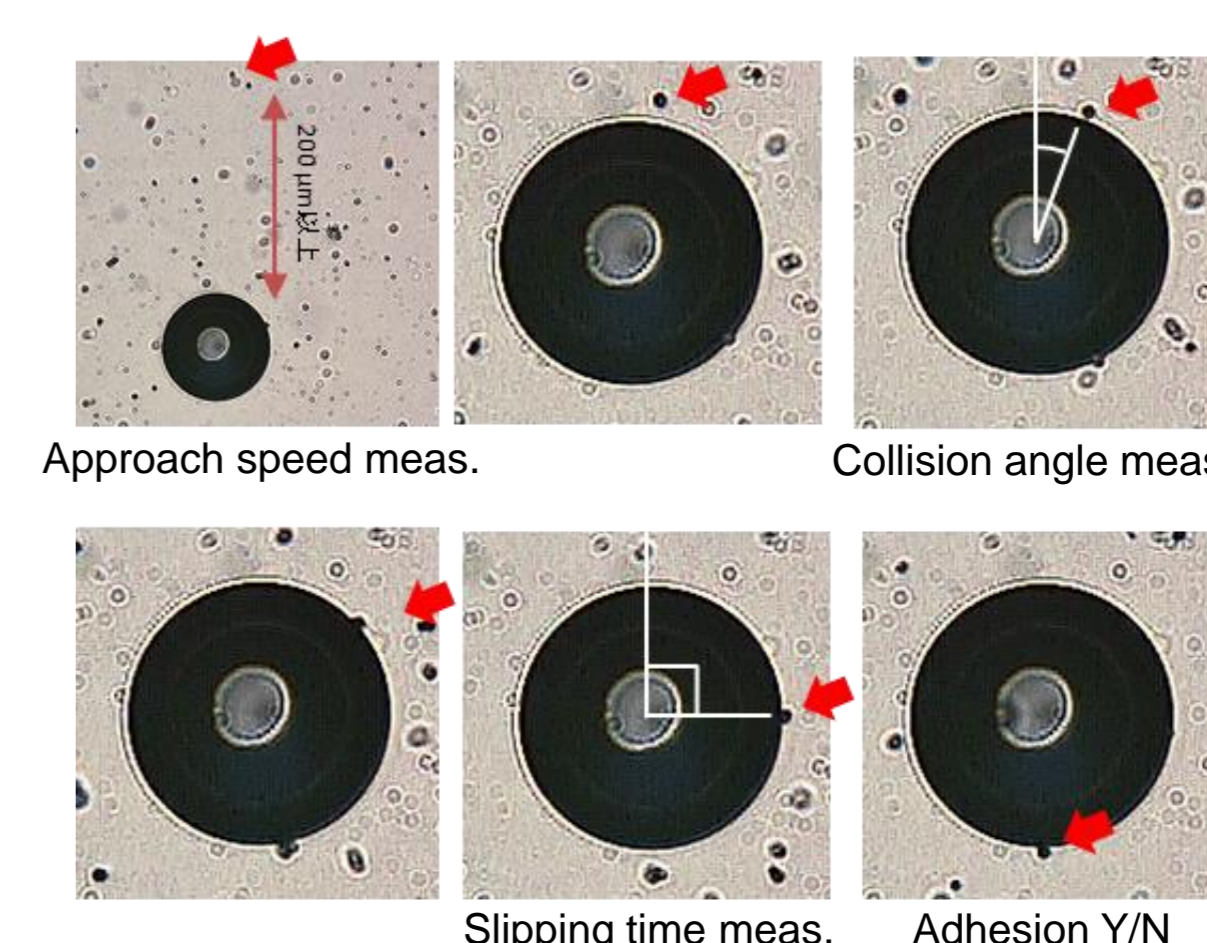
- ◆ **Mechanical comminution** to achieve high liberation
- ◆ Clarification of mechanism of the **electrical disintegration**
- ◆ Development of high performance **sensor based sorting (LIBS·XRF·XRT** etc.) and the process optimization
- ◆ Stochastic and rheological study on **flotation**
- ◆ Concentration of **precious metals** from scrap **catalyst** by **flotation**
- ◆ Recovery of **precious metals** from **incineration bottom ash**



The first developed LIBS sorter in the world, Feb, 2015



Equipment for measuring bubble-particle adhesion



Measuring process of bubble-particle adhesion