

OWADA LAB.

[Smart Recycling]

Integrated Research Center for Sustainable Energy and Materials

Materials Separation and Recycling Engineering

<http://susmat.iis.u-tokyo.ac.jp/english/members.html#oowada>

Smart Recycling

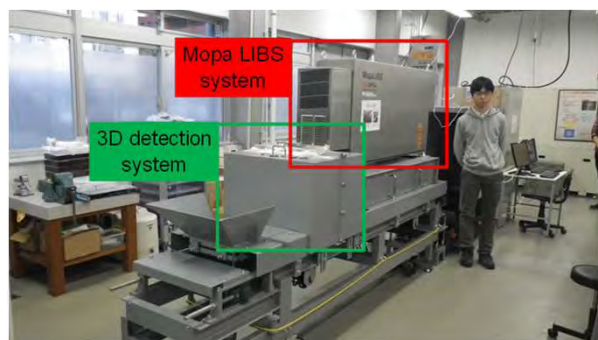
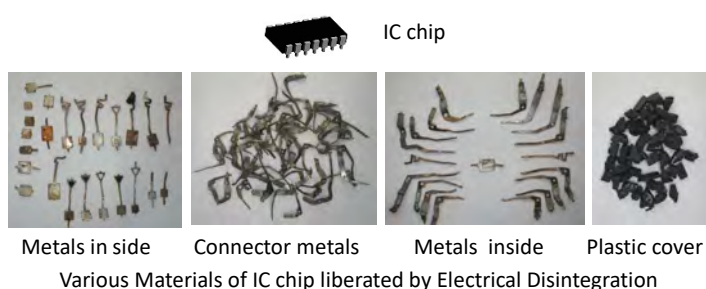
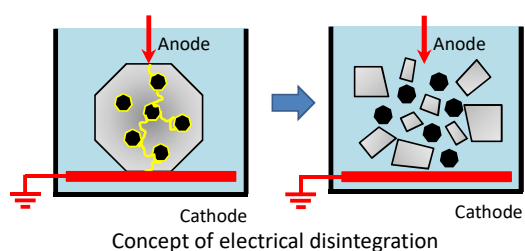
Smart Comminution and Separation

Valuable and useless components are found simultaneously in natural and artificial (waste) resources. Hence, it is necessary to recover the former elements and discard or appropriately treat the latter ones. The key technology of solid–solid separation, i.e., **“SOFT SEPARATION”**, ought to be applied with high efficiency and high reliability. To achieve the above separation, two kinds of technological developments are essential.

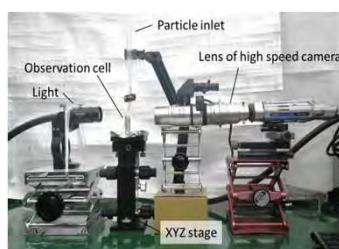
1. **Smart Comminution** to make good liberation of componential elements
2. **Smart Sorting** of compositional elements with high energy efficiency

Some potential research topics are as follows:

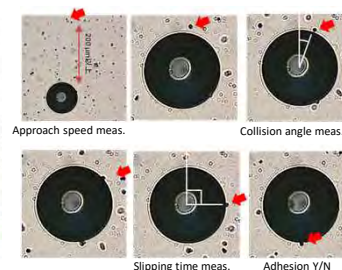
- ◆ **Mechanical comminution** to achieve high liberation
- ◆ Clarification of mechanism of the **electrical disintegration**
- ◆ Development of high-performance **sensor-based sorting (LIBS·XRF·XRT etc.)** and process optimization
- ◆ Stochastic and rheological study on **flotation**
- ◆ Production of high purity glass materials from spent PV panels
- ◆ Recovery of **precious (heavy) 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