

OWADA LAB.

[Smart Recycling]

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Materials Separation and Recycling Engineering

Smart Recycling

Smart Comminution and Separation

Since valuable and useless components are mixed in natural and synthetic (waste) resources, it is necessary to recover the former elements and to reject/appropriately treat the latter elements. 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.

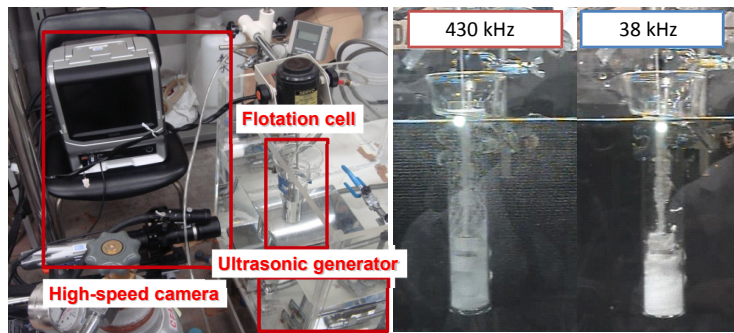
1. Smart comminution to make good liberation of compositional elements.
2. Smart separation of compositional elements with high energy efficiency

Followings are the examples of research topics.

- High performance LIBS, XRF, XRT sorting process
- Micro-bubble flotation process with ultrasonic irradiation
- Comminution and separation to concentrate minor rare metals from e-waste
- Concentration of cathode materials from scrap lithium ion battery
- Comminution and separation to concentrate PGMs from scrap auto-catalyst



“Sash to Sash” Pilot Plant using XRT·XRF sorters



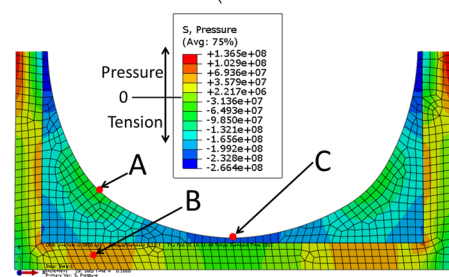
Micro-bubble Flotation Cell with Ultrasonic Irradiation (can control the bubble size)



IC chip



Metals in side Connector metals Metals inside Plastic cover
Various Materials Liberated by Electrical Disintegration



Stress Distribution after Quenching of Automobile Catalyst (Tensile stress is applied only to coat layer with PGMs)