TOKORO LAB.

[Resource Circulation, Separation-Concentration, Powder Processing]

Endowed Research Unit for Non-ferrous Metal Resource Recovery Engineering (JX Metals Endowed Unit)

Environmental Resource Processing Engineering

http://www.metals-recycling.iis.u-tokyo.ac.jp/chiharutokoro.html
http://www.tokoro.env.waseda.ac.jp/

Technologies for Resource Circulation / Environmental Restoration

Valorization of the urban mine resources and refractory ores by advanced technologies for solid separation and concentration.

Special Grinding Technologies for Separation of Solids

Soil Remediation by surface grinding

- Increase of SiO₂ exposure by removal of surface Mn
- Concentration of Mn into a fine particle fraction

Solid analysis to investigate the mineral separation

Mineral Liberation Analyzer (MLA)

- Identification of the mineral phases
- Quantification of liberation degree and weight ratio of each mineral

Pretreatment Operations for Improving the Solid Separation

Recovery of Co from Li-Ion batteries by slow heating

- Process analysis to improve the recovery of valuable metals from Li-Ion batteries (LIB)
- Co₃O₄ particles after slow heating

Recovery of magnetite by slow-cooling crystallization

- Study of the separation of magnetite from an amorphous phase slag via smooth-cooling crystallization and magnetic separation
- Magnetite particle size and precipitation rate increased by decreasing the cooling rate

Advanced Technologies for Environment Remediation

As removal by surface precipitation

- Study and optimization of surface precipitation
- Removal and recovery of inorganic elements in high efficiency

Removal enhancement by amorphization

- Calcination of MgCO₃ to MgO and quenching to suppress crystallization
- Enhancement of boron removal

Process optimization by combination of geochemical modeling and fluid analysis

- Creation of ground model from terrain data and reproduction of the dynamic shape water bodies
- Prediction of concentration profiles by considering chemical equilibria