

Metal recovery from liquid and solid wastes

Summary

Profile type

Technology offer

Company's country

Spain

POD reference

TOES20230914013

Profile status

PUBLISHED

Type of partnership

**Research and development
cooperation agreement**

Targeted countries

• World

Contact Person

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Term of validity

14 Sep 2023**13 Sep 2024**

Last update

14 Sep 2023

General Information

Short summary

A Spanish research centre has designed a treatment with low environmental impact technologies, of liquid and solid wastes, to extract and recover metals to be used as secondary raw materials, based on a circular economy concept. Partners for a research or technical collaboration are sought to bring closer the treatment to real environment and to start applying it in different wastes.

Full description

The treatment that the Spanish research centre has designed consists of the extraction and recovery of metals from liquid and solid wastes, especially the critical ones, such as Co, Cu, Zn, Li, Mn, Ni, Au and Pd, to be used as secondary raw materials.

Both, the waste to be processed and the metals to be recovered, will define the sequential treatment using different technologies. The whole treatment prioritizes low chemicals and energy consumptions as well as a circular economy approach. Electrochemical technologies are the core of the treatment.

Starting from liquid or crushed/shred/cut solid waste a complete sequence of the treatment would include one or several of the following steps: pre-treatment, leaching, separation and recovery. Metals are obtained as metallic, salts or oxides chemical state. Once recovered they could be used as secondary raw materials in many sectors.

Electrochemical technology is used to leach metals or to recover them in metallic state.

Depending on the metal or group of metals the TRL of the treatment is between 4 and 5. For now, it has been tested with the following wastes: Li Batteries, electronic wastes, metallized plastic and metallic liquid waste from surface treatment sector.

The centre looks for partners to establish a research or technical agreement to increase the TRL of the treatment making it closer to an operational environment and to start applying it in other wastes.

Advantages and innovations

The main advantages come from the use of electrochemical pathways as main treatment in the extraction or recovery of metals, specifically the following:

- Avoiding use of toxic chemicals
- Minimizing secondary wastes
- Avoiding extreme pHs or thermal swings
- Better selectivity to separate metals in multicomponent mixtures

Additionally, it is a versatile, modular, and scalable approach and can be easily combined with hydrometallurgical technology.

Technical specification or expertise sought

- Anode recovery in Lithium batteries
- Formulation of new cathodes for Lithium batteries using metals recovered coming from their recycling process.
- Optimization of Fe removal in liquids where it is mixed with other metals

Stage of development

Lab tested

IPR Status

No IPR applied

Sustainable Development goals

- **Goal 12: Responsible Consumption and Production**
- **Goal 9: Industry, Innovation and Infrastructure**

Partner Sought

Expected role of the partner

The centre looks for partners from the research or from the industrial sectors to establish a research or technical agreement to increase the TRL of the treatment making it closer to an operational environment and to start applying it in other wastes.

Type of partnership

Type and size of the partner

Research and development cooperation agreement

- R&D Institution
- SME <=10
- SME 50 - 249
- SME 11-49
- University

Dissemination

Technology keywords

- **10004001 - Industrial Water Treatment**
- **10003004 - Recycling, Recovery**
- **02007010 - Metals and Alloys**
- **10003007 - Waste to Energy /Resource**

Targeted countries

- **World**

Market keywords

- **08004004 - Other pollution and recycling related**
- **09008002 - Water, sewerage, chemical and solid waste treatment plants**
- **09004008 - Other manufacturing (not elsewhere classified)**

Sector groups involved

- **Energy-Intensive Industries**