Technology Offer

Alternative Bioleaching process of metals from secondary resources (industrial wastes)

Summary

A Belgian Research Centre developed (stage of development: technology validated in lab TRL 4) a microbial assisted leaching process designed for metal recovery from secondary resources. The technology is based on a new process integrating bacterial cell encapsulation for a higher resistance to dissolved organics and heavy metals. The research center looks for companies and universities for licensing patents, to develop European projects and further applications in other sectors (other residues)

Creation Date	30 August 2017
Last Update	06 September 2017
Expiration Date	06 September 2018
Reference	TOBE20170830001

Details

Description

A Belgian Centre for applied and basic research in microbiology (fundamental microbiology to bioprocesses development) has developed (stage of the development: TRL 4 - technology validated in lab) an emerging technology designed for metal recovery from secondary resources. Based on well-established know-how for copper-ores refinery and precious metal biomining, the microbial assisted leaching offers new opportunities for heavy and precious metals recovery from electronic wastes, end-of-life vehicles, spent catalysts and numerous industrial residues...

This technology offers :
- recovering opportunities for low metal-content residues which are not economically viable in conventional recycling technologies.
- Economical and environmental sustainable alternative to landfill of series of selected poly-metallic industrial wastes.
- Eco-friendly nature of biohydrometallurgy compared to chemical processes or pyrometallurgy, is supported by mild operating conditions (low-pressure and temperature, reduced chemical input).
- Cell encapsulation offers higher extraction rates by enhanced cell density, biomass protection against harsh medium conditions and facilitated continuous process.
- Good results with copper extraction e.g. from brake-pads manufacturing residues.
- Good performance/return compared to other bioleaching processes.

The process can be applied on polymetallic residues from several industrial activities: metallurgy (anode slags, dusts, speiss,…), catalyst industry, automotive industry,…

The Institution is seeking research collaboration, technical transfer, knowhow transfer…

Two types of partnerships are sought:
*on the industrial level:
-licencing patent rights regarding a new efficient bioleaching process
*on the research and development level:
- developing academic and / or industrial collaborations to explore applications in other application sectors;
- participate on an European project regarding circular economy

Advantages and Innovations

- Economical and environmental sustainable alternative to landfill of series of selected poly-metallic industrial wastes.
- Eco-friendly nature of biohydrometallurgy compared to chemical processes or pyrometallurgy, is supported by mild operating conditions (low-pressure and temperature, reduced chemical input).
- Cell encapsulation offers higher extraction rates by enhanced cell density, biomass protection against harsh medium conditions and facilitated continuous process.
- Good results with copper extraction e.g. from brake-pads dust : 15% copper extraction in 48-72h
- Good performance/return compared to other bioleaching processes : pulp densities up to 20%

Stage of Development

Under development/lab tested

Comments Regarding Stage of Development

Efficiency demonstrated with copper extraction from automotive industry residues.
The laboratory starts to test other metals: other industrial residues and Neodymium from permanent magnets residues (HDD, loudspeakers,…)

IPR Status

Patent(s) applied for but not yet granted

Comment Regarding IPR status

Patent application in last stages

Profile Origin

Private (in-house) research

Keywords

Technology

02007011	Non-ferrous Metals
06002008	Microbiology
06006012	Bioprocesses
10003004	Recycling, Recovery
10003009	Rare Earths Metals Treatment

Market

04010	Microbiology
08001012	Speciality metals (including processes for working with metals)
08004002	Chemical and solid material recycling
08004004	Other pollution and recycling related
08005	Other Industrial Products (not elsewhere classified)

NACE

M.72.1.1	Research and experimental development on biotechnology

Network Contact

Issuing Partner

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Open for EOI : Yes

Dissemination

Send to Sector Group

Environment

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

0

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
Dutch
French

Client Country

Belgium

Partner Sought

Type and Role of Partner Sought

Two types of partnerships are sought:
1. Industrial partners for licencing patent rights regarding a new efficient bioleaching process
2. And/or Universities or research centers
- to developing academic and / or industrial collaborations to improve / to explore further applications of these process in other sectors

Type of Partnership Considered

License agreement
Technical cooperation agreement
Research cooperation agreement

Attachments