

## Technology Offer

# Method of recuperative treatment of the nickel ion from residual solutions

## Summary

*A research team from a Romanian university has invented a method of recuperative treatment of the nickel ion from residual solutions. The method has as main advantage establishing optimum conditions of cleaning solutions containing compounds of the nickel waste. The research team is looking for industrial partners interested in license agreements and technical cooperation agreements.*

<b>Creation Date</b>	20 December 2015
<b>Last Update</b>	19 January 2016
<b>Expiration Date</b>	19 January 2017
<b>Reference</b>	TORO20151109001

## Details

### Description

A Romanian research team has invented a method of recuperative treatment of the nickel ion from residual solutions resulted in the processes related to engineering industry, electrical industry and other related industries that widely use electrochemical technology- nickel. From the residual solutions result technological flow rinse waters with low nickel and depleted electrolyte, with a higher concentration of metal, and these residual solutions need to be treated.

In a first phase, the process consists in the extraction of the ion nickel as nickel oxalate dihydrate in the following optimal reaction conditions: molar concentration of nickel in solution of approximately 0.02, pH (potential hydrogen) of the solution 4.5, oxalic acid in excess of 100%, reaction temperature of 80° C; then, by low thermal decomposition of nickel oxalate obtained at a temperature of 320 ... 360° C, is obtained nickel oxide.

The nickel oxide thus obtained is used as enamelling oxide adherence to metal surfaces, for preparation of salts or as nickel catalyst in various chemical processes.

The foreign partner that the Romanian research team is looking for can be an industrial partner interested in license agreements and technical cooperation agreements, in order to improve the existing method.

### Advantages and Innovations

The technical problem solved by the invention relates to establish optimum cleansing waste solutions whose concentration, namely that of chemical and electrochemical nickel in various metallic and non-metallic supports, rose to levels of 6...7 g Ni<sup>2+</sup>/ dm<sup>3</sup>, in order to capitalize nickel as nickel oxalate, while solving ecological problems of the environment.

Other advantages that can be mentioned are:

- high purity of the lead oxalate;
- superior decantation, filtration and washing speed of the precipitate as compared to the forms used within other methods;

- considerable reduced volume for the crystallized precipitate;
- crystalline and anhydrous form of the recovered product;
- chemical stability to atmospheric factors (humidity, heat, light, carbon dioxide).

Compared to other technologies, the presented method removes the following disadvantages of known solutions, which are linked to the amorphous state, the unevenness of compositional extracted forms, the large volume of precipitate even in optimum time settling, low speed filtration and washing of the precipitate instability chemistry to atmospheric agents with passage in soluble pollutant forms.

## Stage of Development

Field tested/evaluated

## Comments Regarding Stage of Development

The method for the recuperative treatment of the nickel ion from residual solutions was tested within several local SMEs.

## IPR Status

Patents granted

## Comment Regarding IPR status

Patent granted by the State Office for Inventions and Trademarks. IP rights on national level - Romania.

## Keywords

### Technology

06006012	Bioprocesses
10002012	Remediation of Contaminated Sites
10004001	Industrial Water Treatment

### Market

04005	Biochemistry / Biophysics
08004002	Chemical and solid material recycling
08004003	Water treatment equipment and waste disposal systems
08004004	Other pollution and recycling related

### NACE

M.72.1.9	Other research and experimental development on natural sciences and engineering
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## Network Contact

### Issuing Partner

NATIONAL INSTITUTE OF RESEARCH AND DEVELOPMENT FOR OPTOELECTRONICS

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**Open for EOI :**    **Yes**

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**Dissemination**

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**Send to Sector Group**

Environment

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**Client**

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**Type and Size of Organisation Behind the Profile**

University

**Year Established**

1991

**Already Engaged in Trans-National Cooperation**

Yes

**Certification Standards**

ISO 14001:2005

ISO 9001:2008

**Languages Spoken**

English

**Client Country**

Romania

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**Partner Sought**

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**Type and Role of Partner Sought**

The potential partners could be any SME active in the field of electrical industry, the engineering industry, the naval industry, etc.

Concerning the technological cooperation agreement sought, would also like to find a foreign partner for the further technological development, by improving the existing method.

## **Type and Size of Partner Sought**

SME 11-50, SME <10, SME 51-250

## **Type of Partnership Considered**

License agreement

Technical cooperation agreement