

# Analytical method for assessing the degree of recovery of metals from waste electrical and electronic equipment (WEEE)

## Summary

|  |   |                        |
|--|---|------------------------|
| Profile type                               | Company's country                                     | POD reference          |
| <b>Technology offer</b>                    | <b>Romania</b>  | <b>TORO20220712009</b> |
| Profile status                             | Type of partnership                                   | Targeted countries     |
| <b>PUBLISHED</b>                           | <b>Commercial agreement with technical assistance</b> | <b>• World</b>         |
| Contact Person                             | Term of validity                                      | Last update            |
| <a href="#">Cristina-Maria Balgaradean</a> | <b>1 Sep 2022</b><br><b>1 Sep 2023</b>                | <b>1 Sep 2022</b>      |

## General Information

### Short summary

A Romanian research institute located in the north-western part of the country has developed a method for assessing the degree of recovery of metals from waste electrical and electronic equipment (WEEE) (TRL6). The Romanian research institute is offering commercial agreement with technical assistance to interested partners (SMEs, big companies and/ or universities) active in the field of analytical chemistry, recovery of WEEE, bioeconomics, design of electrical equipment/ devices etc.

### Full description

With an extensive experience in the fundamental and applied research in environment & health, bioenergy & biomass and respectively, in analytics & instrumentation, a Romanian research institute from Transylvania is involved in research activities in the field of innovative technologies for the advanced recovery of materials from IT and telecommunications equipment waste.

Having in view the fact that the amount of waste electrical and electronic equipment (WEEE) generated every year in the EU became one of the fastest growing waste streams, the complete recovery of the components and materials from WEEE comes as a priority in the context of circular economy.

Thus, the Romanian research team specialized in modern analytical methods for monitoring and controlling the technology flow for obtaining reusable materials from WEEE; the main objectives had in view:

- quantification of the transformations occurring in the chemical composition of some WEEE, during the process of transformation from waste into reusable materials as a result of some chemical and electrochemical processes to which they may be subjected in the preliminary stage;

- the development, validation and implementation in the laboratories of the Romanian research institute of a set of modern analytical methods for the characterization of WEEE during the process of transformation from waste into reusable materials;
- valorization and dissemination of knowledge and research results.

In this context, the Romanian research team has developed an analytical method for assessing the degree of recovery of metals from leaching solutions resulting from the dissolution of exposed metals from WEEE (TRL 6). The method is eco-friendly and among its innovative characteristics one can mention the determination of recovery coefficients of metals from WEEE (content of As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn present in the leaching solution). The method is validated and already implemented in the laboratory of the Romanian research institute.

Willing to support environment protection and ensure circular economy, the Romanian research institute offers its analytical method for assessing the degree of recovery of metals from WEEE to foreign partners among which one can mention chemical laboratories, environmental protection agencies, waste management and/ or collection companies, universities, etc. The cooperation envisaged is commercial agreement with technical assistance.

#### Advantages and innovations

The method developed by the Romanian institute is characterized by the following attributes:

- high precision analytical method;
- reduced consumption of reagents;
- validated & implemented in the laboratory;
- tested on real samples.

#### Technical specification or expertise sought

This method is intended to assess the degree of recovery of metals from leaching solutions resulting from the dissolution of exposed metals from waste electrical and electronic equipment (WEEE).

Principle of the method consists in the measurement of the concentration of the elements As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn using a Perkin-Elmer inductive coupled plasma mass spectrometer (model DRC II), with quadrupole and equipped with reaction cell for elimination of interferences, with the mass range 3 - 240 m/z.

Detection limit: 0.5 µg/ L for each of the considered elements.

Working range: up to 100 µg/ L (with the possibility of expansion by suitable dilutions).

Degree of recovery: 80... 115%.

Uncertainty of the method: max. 17%.

Field of use: analytical chemistry, recovery of WEEE, bioeconomics, design of electrical equipment/ devices etc.

#### Stage of development

**Available for demonstration**

#### IPR Status

**IPR applied but not yet granted**

#### Sustainable Development goals

- **Goal 13: Climate Action**
- **Goal 9: Industry, Innovation and Infrastructure**
- **Goal 12: Responsible Consumption and Production**

## Partner Sought

### Expected role of the partner

The Romanian research institute is looking for foreign partners among:

- chemical laboratories, specialized in the field of circular economy,
- environmental protection agencies, focusing on urban waste recovery;
- waste management and/or collection companies;
- universities with interests in chemistry or electronics etc.

Under the commercial agreement with technical assistance, the sought partners (SMEs, big companies and/ or universities) should implement the analytical method for assessing the degree of recovery of metals from WEEE. The Romanian research institute will support its foreign partners with the provision of additional support services.

### Type of partnership

**Commercial agreement with technical assistance**

### Type and size of the partner

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

## Dissemination

### Technology keywords

- **10003004 - Recycling, Recovery**
- **001001013 - Printed circuits and integrated circuits**
- **09001002 - Analyses / Test Facilities and Methods**

### Targeted countries

- **World**

### Market keywords

- **08004004 - Other pollution and recycling related**
- **03004003 - Other electronics related equipment**
- **03007002 - Other measuring devices**

### Sector groups involved

- **Environment**
- **Digital**