



e.THROUGH

Thinking rough towards sustainability

Alexandra B. Ribeiro





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(H2020-MSCA-RISE-2017-778045)



- ✓ **Project financed by the EU Framework Programme for Research and Innovation HORIZON 2020 - (1.3.2.) EXCELLENT SCIENCE - MARIE SKŁODOWSKA-CURIE ACTIONS – Research and Innovation Staff Exchange (RISE)**
- ✓ **Aims to support career development and training of researchers through international and inter-sector mobility.**

Why is it important?

To tackle its critical raw material (CRM) dependency, Europe needs comprehensive strategies based on sustainable primary mining, recovery from secondary resources and recycling.

The EC classified 27 CRMs due to their high economic importance and high risk of supply interruption.

e.THROUGH has the **ambitious vision of turning the challenge of CRMs dependence into a strategic strength for Europe** by:

1. Promoting new trends in the characterization and exploration of mineral deposits;
2. Mapping CRMs between EU mining regions;
3. Gaining knowledge on innovative processes for recovery secondary CRMs;
4. Redesign construction materials using secondary materials, closing loops, strongly supporting waste minimization;
5. Life Cycle Assessment (LCA) for the evaluation of global environmental impacts;
6. Transferring newly generated knowledge to stakeholders, both for policy development and standardization, and for shaping responsible behaviours.



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Coordinator: A. B. Ribeiro



UNIVERSIDAD DE MÁLAGA



Technical University of Denmark



E-MINES

EC Recycling



Northeastern University

AMPHOS²¹
SCIENTIFIC AND STRATEGIC ENVIRONMENTAL CONSULTING

— Coordinator

— University

— SME



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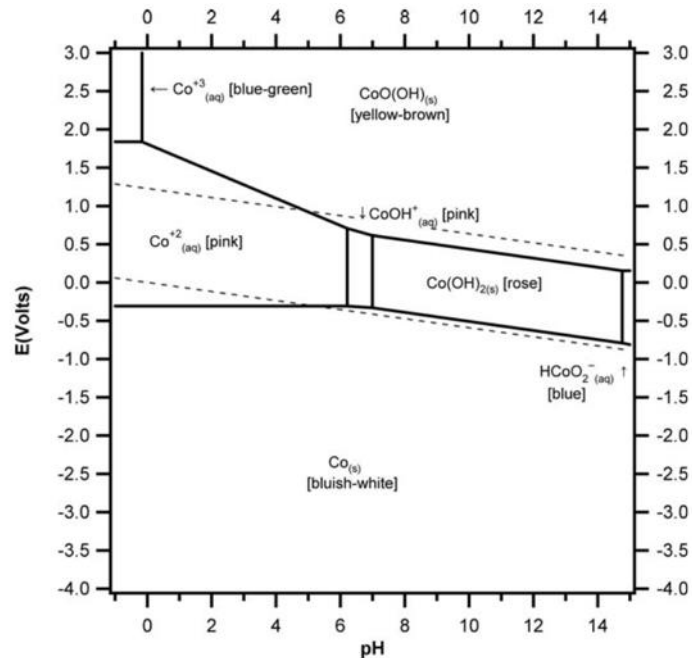
WC-Co scrap powder



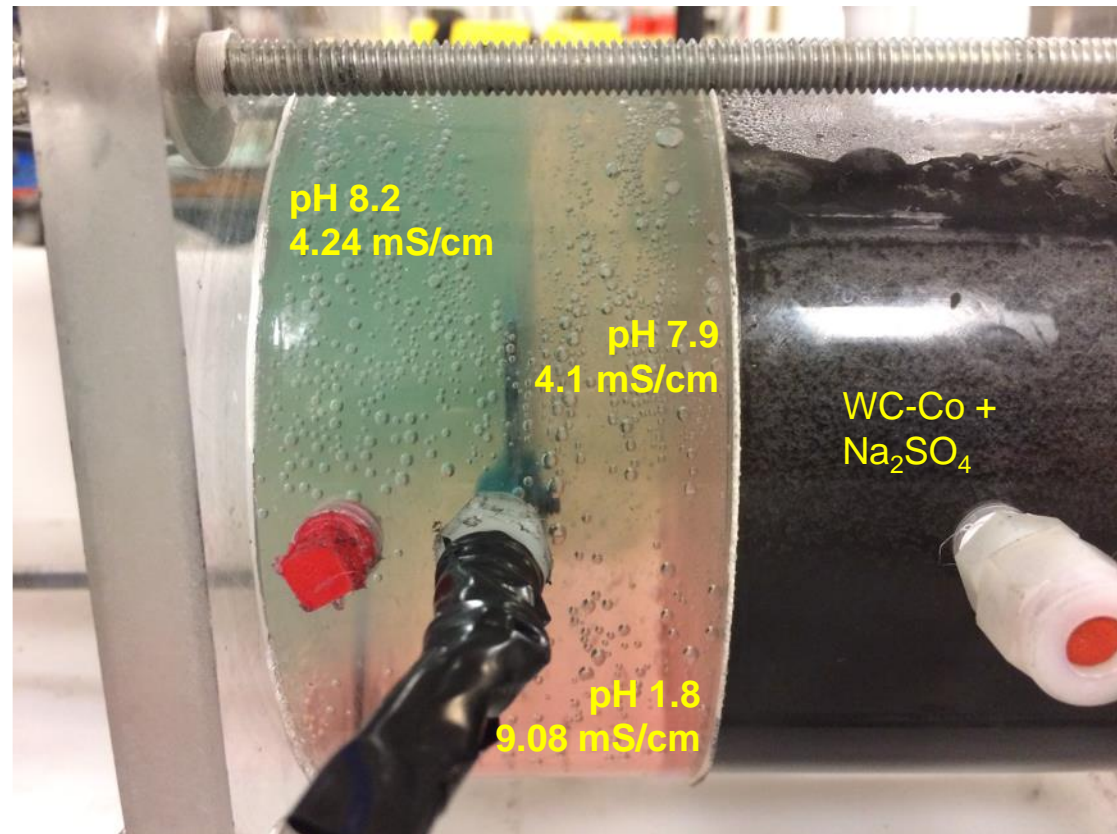
Tungsten carbide
scrap powder



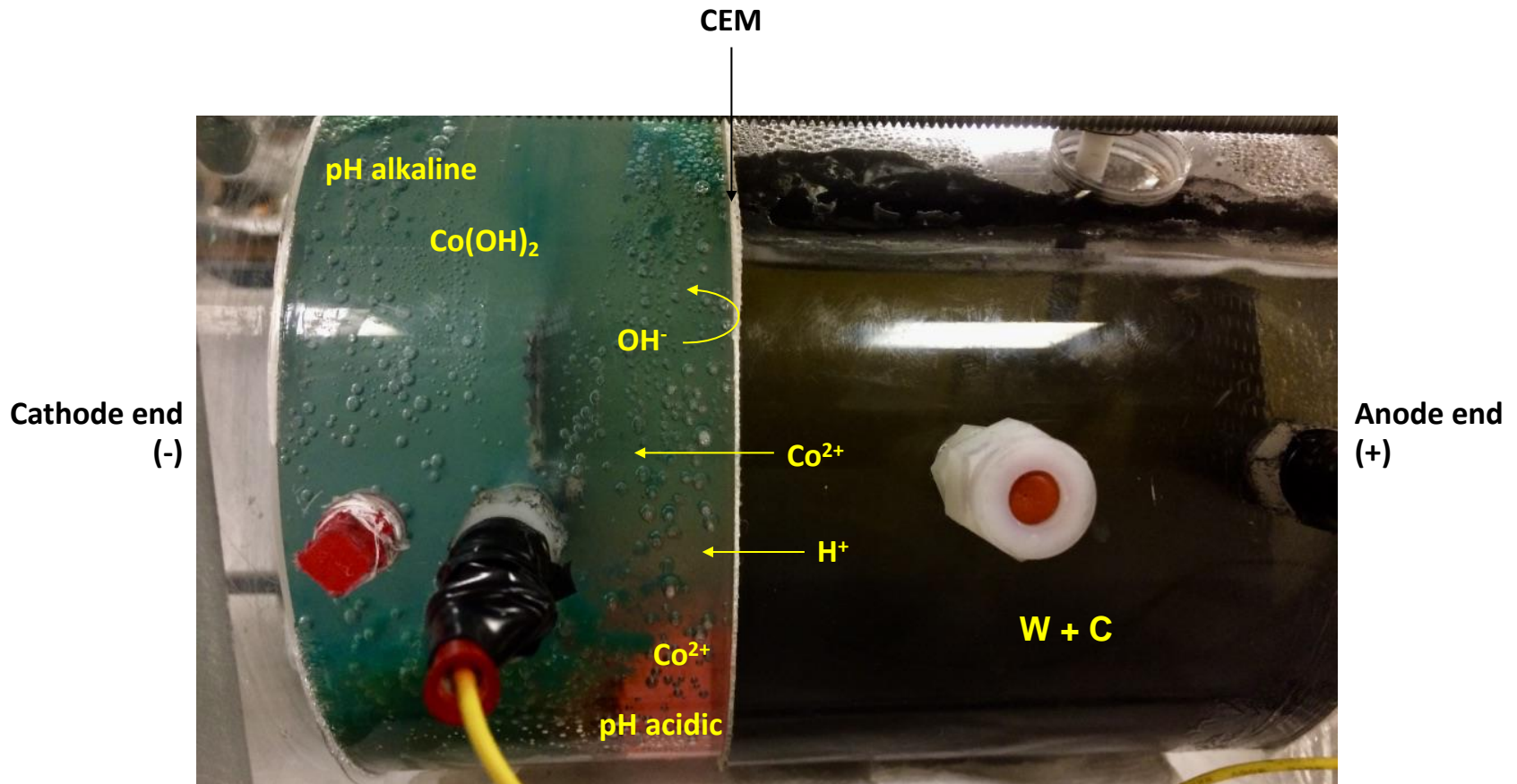
Electrodialytic W and Co recovery



E-pH diagram for Co species. Soluble species concentrations (except H^{+}) = $10^{-1.0}$ M. Soluble species and most solids are hydrated. No agents producing complexes or insoluble compounds are present other than HOH and OH^{-} .



Electrodialytic W and Co recovery





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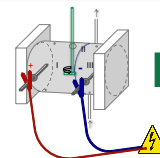
Recovery of mining residues from Panasqueira mine

Secondary resources



- High amounts of MT → landscape, environmental and public health problems
- MT have contents of critical raw materials (CRM EU List 2017)
- Limitation: harmful compounds

Potential motor for sustainable technologies innovation to remediate harmful compounds (arsenic) and recover CRM (tungsten), contributing for circular economy in EU



Electro-based technologies

Safe MT reuse in building materials



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REMIX
Interreg Europe



**E.Through Project
E-Mines**



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@eTHROUGHproject

Timeline:

2018-01-01 to 2021-12-31



https://sites.fct.unl.pt/e_through/

Thank you!
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Grant Agreement No. 778045 – H2020-MSCA-RISE-2017