

EU - H2020



C R O C O D I L E

An innovative biochemical route to recover Cobalt from lateritic mining waste

1

Hubau, A., Pino Herrera, D., Joulian, C., Guezennec, A.G.

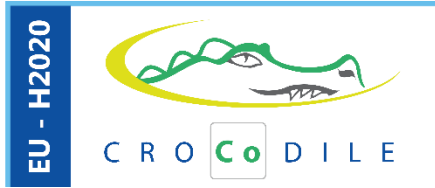
(Re)Mining extractive waste, a new business?" symposium, May 2022



First of a kind commercial Compact system for the efficient Recovery Of COBalt Designed with novel Integrated LEading technologies

This project has received funding from the European Union's EU Framework Programme for Research and Innovation Horizon 2020 under Grant Agreement No 776473 - <https://h2020-crocodile.eu/>

The project



2

- First of a kind commercial Compact system for the efficient Recovery Of CObalt
Designed with novel Integrated LEading technologies



23 partners
2018-2022

- Unique combination of advanced mechanical, wet mechanical and pyro-metallurgical processes to process both primary and secondary resources.
- Optimize all the above mentioned processes and combine them in a compact commercial mobile system with a production capacity of up to 200kg of cobalt metal per day.

Primary resources

3



Limonite 0.8 to 1.5% Ni

Transition 1.5 to 2% Ni

Saprolite 1.8 to 3% Ni

Existing processing options
(high pressure acid leaching,
Caron process) are hardly
profitable

Most of the time, stockpiled and
considered as waste

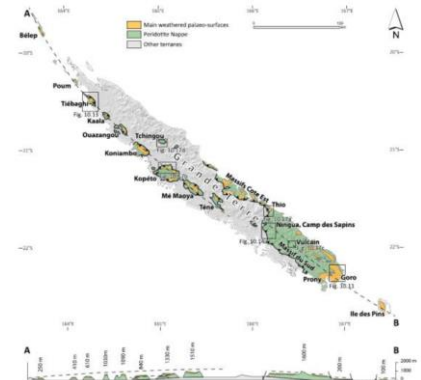
0.1 to 0.2% Co

One of the resources targeted in the
Crocodile project

Smelters for Ni recovery

2 samples from New
Caledonia lateritic mines

In %	Fe ₂ O ₃	Cr ₂ O ₃	MnO	Co	Ni
NC2	69,6	2,95	1,19	0,16	1,35
NC3	47,8	1,85	7,34	1,25	0,75



Bailly et al., 2021

Schematic laterite profile
Oxley and Barcza 2013

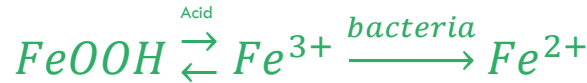
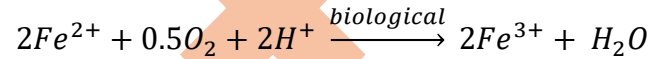
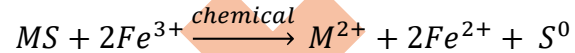
Biohydrometallurgy

4

Oxidative bioleaching



Reductive bioleaching



- Applied at industrial scale
- For sulfidic ores or wastes

- Oxidized ores
- Low TRL

Same micro-organisms and same operating conditions as oxidative acidophilic bioleaching (pH 1-2 ; 30°C – 50°C ; CO₂) but absence of O₂

Objectives

Better understanding of the mechanisms
 Optimisation of the operating conditions
 Scale up from lab to pilot scale

In collaboration with Bangor University
 and National History Museum