



| SUPERVISOR INFORMATION | |
|---|--|
| First and Last name | Helena Passos |
| URL of supervisor webpage | |
| Department | Department of Chemical and Biological Engineering |
| Field(s) of research | Solvent extraction / hydrometalurgy / thermodynamics |
| PROJECT PROPOSAL | |
| Title (optional) | |
| Brief project description | |
| <p>European Union is to become climate neutral by 2050. Renewable energy needs to become the main energy source and technologies such as wind turbines, solar photovoltaic panels and batteries will be essential. This will require development, maintenance, and replacement of infrastructures. Raw materials needs will drastically increase, including critical raw materials, and new waste streams of significant environmental impact will appear in a very short time. Despite the urgency of climate neutrality, it is mandatory to invest efforts in the circularity of renewable energy technologies. The development of economically feasible recycling processes allowing us to obtain economically competitive recycled raw materials is the first requirement of any developed process and one of the biggest challenges. The diversity of waste and their intrinsic heterogeneity makes this challenge even harder. Typically, the most valuable metals are at lower concentrations and diluted among less valuable components. Harsh chemical conditions of high environmental impact are almost a requirement to extract metals from these residues. The main goal of this project will be the development of a new hydrometallurgical process for the recovery of critical and strategic metals from waste. The use of alternative, greener, selective, and efficient solvents for metals leaching will be pursued, while more efficient, tunable and stimuli responsive systems for metal extraction, separation, and recovery will be studied. The scale-up of developed process will be of high importance to show its technical feasibility, while life-cycle analysis (LCA) and economic analysis will be carried-out in a final stage. If successful, this project will be contributing to the change of industrial mindset concerning the use of recycled raw materials and the development of a greener and sustainable industry.</p> | |