

Metals recycling

ECTS	Course (h)
3	18

Mention du master transmettant la fiche UE :	Chimie et Sciences des Matériaux
Composante de gestion de l'UE :	Faculté des Sciences – Département de Chimie
Responsable de l'UE :	Christelle GOUTAUDIER
Statut du responsable :	PR

REQUIREMENTS

M1 Chimie et Sciences des Matériaux

PROGRAMM

In an constrained economic and environmental context, the recovery and recycling of metals are now at the heart of industrial concerns and are of strategic interest. The waste considered in this case is post-consumer waste, which is a major source of secondary raw materials, but is more difficult to capture than industrial waste.

OUTLINE

I - General: Why, how, who ?

- Strategic issues, primary / secondary raw materials, critical metals
- Circular economy, life cycle analysis
- European legislation

II - The stages of recycling:

- comminution (waste preparation, dismantling, shredding)
- concentration (characterisation of the deposit, separation of materials)
- extraction: hydrometallurgy (leaching, liquid-liquid extraction), pyrometallurgy (reactive fusion, distillation)
- purification (precipitation, phytoextraction, refining...)

III - The main recycling schemes:

- DEEE
- Batteries and accumulators
- End of life of vehicles
- Others

SPECIFIC SKILLS

- Make a critical assessment of raw materials
- Controlling the life cycle of materials
- Define the different stages of recycling processes and associated technologies
- Knowing the main recycling flows
- Following the evolution of the regulations concerning the recycling of metals