KU LEUVEN

Katholieke Universiteit Leuven Leuven, Belgium





ABOUT

SIM² KU Leuven is a world-leading, interdisciplinary research cluster at KU Leuven in the field of urban and landfill mining. SIM² KU Leuven's mission is to perform cutting-edge fundamental, strategic and applied research contributing to cost-effective, zero-waste valorisation of End-of-Life waste, mining waste and industrial process residues.

EXPERTISE

SIM² KU Leuven targets zero-waste valorisation of urban and industrial waste. Key focus areas are:

- 1. Direct (pre-consumer) recycling of metal scrap and swarf generated during the production of metal based (intermediate) products
- 2. Post-consumer recycling and/or urban mining of, respectively, flows and stocks of complex, multi-material, metal-containing products (as for instance a hybrid electric vehicle)
- 3. Landfill mining of historic urban solid waste
- 4. Metal recovery from flows of industrial process residues from primary and secondary metal production
- 5. Metal recovery from stocks of landfilled mining waste and industrial process residues.

The zero-waste vision implies that for (4) and (5) the residual mineral matrixes are valorised in building or engineered materials.

As the coordinator of 6 (Marie-Curie) European Training Networks (FP7, H2020) and as a leading partner in both EIT Raw Materials and the European Enhanced Landfill Mining Consortium (EURELCO: www.eurelco.org), SIM² KU Leuven has key assets to participate in EU projects. These flagship domains are:

- Solvo- and ionometallurgy (for critical metal recycling (cf. http://www.kuleuven.rare3.eu/ and Advanced ERC Grant SOLCRIMET)
- Pyro/plasma-, electro- and hydrometallurgy
- Development of innovative building materials from secondary
- Enhanced Landfill Mining (cf. http://elfm.eu/and www.eurelco.
- Sustainability assessment of recycling processes (cf. LCA, MFA

FACILITIES & SERVICES

SIM² KU Leuven has extremely well-equipped laboratories for performing work in pyro-, hydro-, electro-, solvo- and ionometallurgy:

- A wide variety of furnaces for pyro- and electrometallurgical experiments
- Various equipments for synthesis/characterisation of molecular organic and inorganic compounds
- Lab-scale and mini pilot-scale equipment for solvent extraction;
- Various analytical techniques, e.g. FEG-EPMA-WDS, ICP-MS, CS-AAS, XRF
- Equipment for process intensification (Autoclave (Büchi Ecoclave) equipped with ultrasound probe; Multiple ultrasound devices, Malvern Mastersizer LDA)

Likewise, state-of-the-art possibilities are present for the development of engineered materials out of cleaned residues:

A fully equipped lab for the synthesis and characterisation of building materials (e.g. Vicat, isothermal conduction calorimetry, a range of rheometry set, Mössbauer spectroscopy, Nanotom Phoenix (submicron resolution), Nikon X, Skyscan 1172 micro CT (micron resolution), mercury intrusion porosimetry etc.)

A detailed list can be found here: http://kuleuven.sim2.be/aboutsim%c2%b2-ku-leuven/research-equipment/



