

Recycling of Lithium-ion batteries – Continuous Selective Leaching of Lithium

Topic suitable for Master Thesis / Plant Design

The success of portable electrical devices (e.g., cell phones and laptops) as well as the breakthrough in electric mobility (e.g., cars) would not have been achievable without lithium-ion batteries (LIBs). The mining of lithium pollutes the environment, as the process requires large amounts of water and emits high quantities of CO₂. Because of the continuously increasing demand for LIBs and the growing scarcity of finite resources, a recycling concept to recover the valuable substances in high purity has to be developed.

The purpose of this work is to investigate the selective leaching of lithium using shredded electrode material (black mass) and CO₂. After a parameter study, the process is to be implemented in the Taylor-Couette Disc Contactor (TCDC), which was developed at CEET. The implementation of this sustainable hydrometallurgical process has a large potential to reduce CO₂ emissions and to gain a leaching solution, where lithium carbonate is precipitated that can be directly reused for battery production.

