

Recycling of Lithium-ion batteries – Continuous Precipitation of Lithium carbonate

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 CO_2 . 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 continuously operated precipitation of lithium carbonate using leaching solutions of shredded electrode material (black mass) and CO_2 . As a pilot plant, the Taylor-Couette Disc Contactor (TCDC), which was developed at CEET, will be used. The implementation of this sustainable hydrometallurgical process has a large potential to reduce CO_2 emissions and to recycle lithium as carbonate that can be directly reused for battery production.

