

## DEVELOPMENT OF AURUBIS' HYDROMETALLURGICAL LI-ION BATTERY RECYCLING PROCESS

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## ABSTRACT

Aurubis AG, Europe's largest Copper producer and globally the largest Copper recycler, has developed and patented a hydrometallurgical process to recycle both pyrolyzed and un-pyrolyzed Black Mass (BM) stemming from Li-ion batteries. This purely inorganic process, comprising of leaching, precipitation, and crystallisation processes, has been developed by Aurubis' R&D Hydromet Department and piloted at our Hamburg site successfully since April 2022.

The process developed by Aurubis centres on a Lithium-first leach whereby most of the Lithium is recovered as a sulphate solution which can be purified or converted into intermediates like Lithium Carbonate. Subsequently, a leach process targeting Nickel and Cobalt is relatively straightforward with impurity removal following. From this leach solution, Cobalt, Manganese and Nickel are separated and recovered as saleable intermediates. The Graphite rich leach residue from the Pilot plant has been used for flotation flowsheet development where concentrates of > 92% Carbon grade from locked cycle tests have already been recently presented.

We will show the evolution of the Aurubis black mass treatment process by presenting the results from consecutive pilot plant campaigns. Specifically: major value element recoveries, accountabilities and product purities achieved will be presented.

Keywords: Li-ion battery recycling, Black Mass, Critical material recycling