

Environmental Profile of Aurubis Nickel Sulfate



**Tomorrow
Metals**

The basis for nickel's technical applications

Nickel is a metal that possesses various useful properties such as mechanical strength, corrosion resistance, good electrical conductivity, and magnetism.

Aurubis produces nickel sulfate of technical quality. This is a material for further processing and purification to obtain nickel and high-quality nickel sulfate. Historically, nickel sulfate has mainly been used in solution as the electrolyte in nickel plating. In recent years, it has also become the preferred chemical feed in the production of cathode materials for nickel-bearing lithium-ion batteries, primarily for electric vehicles.

The environmental footprint of Aurubis Nickel Sulfate

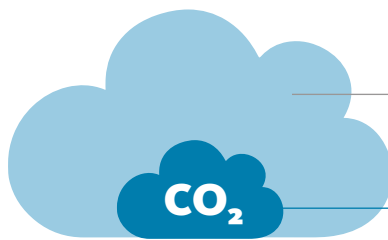
As the EU places more and more emphasis on green

technologies needed to meet its climate targets, it is increasingly important to understand the life cycles of the underlying products.

As a sustainably oriented multimetal company, Aurubis takes responsibility for the global challenges of climate change, environmental protection, and resource conservation. Improving the environmental performance of products, along with enhancing sustainability throughout the entire supply chain, is of great importance for Aurubis. In 2021 we introduced our label 'Tomorrow Metals'. It encompasses the many measures we are taking to enhance our sustainability performance. Aurubis is at the forefront of industries committed to reducing the environmental impact of their operations: We have set the objective of achieving carbon-neutral production well before 2050.

Carbon footprint of Aurubis Nickel Sulphate

in kg CO₂ equivalents per t of Ni content



18,200

Nickel Institute (data reference 2018/2019)²

5,640

Aurubis Nickel Sulfate (data reference 2023)

Note: The Environmental Footprint method (3.0) is the most advanced impact assessment method adopted by the European Commission

Life cycle assessment for Aurubis Nickel Sulfate

Responding to requests from end-users, along with our own sustainability goals, Aurubis conducted a life cycle assessment (LCA) of our nickel sulfate. In this holistic approach, we considered all steps involved in the production — starting from the extraction of the raw materials (cradle) through the production of the nickel sulfate (gate).

The assessment includes impacts from all activities related to raw materials, direct emissions, transport, energy consumption, and auxiliary materials. The study was conducted in conformance with the ISO standards 14040 and 14044 for life cycle assessment.¹ The environmental impacts of Aurubis' products are calculated via the Environmental Footprint impact assessment method (3.0) to align with best scientific and industry reporting practices.

¹ ISO 14040:2021 Environmental management — Life cycle assessment — Principles and framework.

ISO 14044:2021 Environmental management — Life cycle assessment — Requirements and guidelines.

² <https://nickelinstitute.org/media/8d90aff0fc18202/lca-nickel-sulphate-april-2021.pdf>

The results

The key environmental aspects were assessed with the Environmental Footprint impact assessment method (3.0) along 16 impact categories. The main impact categories reported in this factsheet were selected because they represent a broad range of environmental impacts. Results for all 16 indicators are available in the dedicated LCA reports.

However, it is important to note that ‘abiotic depletion

potential’ and ‘toxicity’ are not sufficiently robust and accurate to be used for metals.

We are continuously improving our data quality and LCA modeling as part of best management practice. The allocation between different streams in the tankhouse and spent electrolyte treatment was improved in 2023. To be consistent, the results for 2022 were recalculated in the same way.



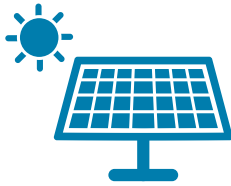
How we got there: Improvements by constantly implementing environmental and climate measures

In the LCA, our goal was to evaluate the environmental profile of Aurubis Nickel Sulfate and allow tracking of the progress and further improvement. The carbon footprint of the nickel sulfate has decreased and is 69 % below the global average for the production of nickel sulfate. The results achieved were only possible with major investments in measures that reach ambitious environmental standards.



Emission reduction

Operations have made continuous efforts to reduce direct emissions of pollutants such as dust as well as greenhouse gas emissions.



Energy-efficient technologies

We invested in energy-efficient technologies at all sites across the Aurubis Group, implemented measures to save energy, facilitated the switch to renewable energies, and enabled decarbonization.



Extending recycling capacities

Nickel sulfate is co-produced during copper production from primary and secondary sources. The extension of our recycling capacities contributed to the improvements of our overall footprint on the environment. The recycled content of Aurubis Nickel Sulfate for calendar year 2023 was 60 %.

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