

Electrowinning of Zinc

A model experiment for the understanding of process routes in mining and recycling

A. Main topics

- Zinc: from ore/scrap to metal
- Oxidation and reduction processes
- Electrowinning of Zinc experiments

B. targeted audience

- 16-19 years old students

C. Key concepts

- Mining and recycling
- Economic and social issues
- Less CO₂ emissions by recycling zinc
- Didactic preparation of electrowinning

D. Experimental activity

- Test of 2 anodes for electrowinning of Zinc
- Oxygen detection: "Blue Bottle Test"

E. Toolkit material

- Experiment 1. a) Devices: glass container as electro-winning cell, holder for plate electrodes, two different lead alloys as anode (Roofing lead anode and Pb/Ag), 2 aluminium electrodes as cathodes, alcohol thermometer, precision balance, laboratory power supply DIGI 30-5 0-30 V/0-5 A, stopwatch. b) Chemicals: ZnO, 1 mol/L, H₂SO₄ 2 mol/L, distilled water H₂O.
- Experiment 2. Chemicals for a 50 mL blue bottle: 0,625 g NaOH biscuits, 5 g glucose, 50 mL dist. H₂O, 0,625 g of a previously prepared methylene blue solution (0,2 g per 100 mL dist. H₂O).

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