Instructions for the Teacher

Batteries

Group Work according to the Puzzle Method

Objectives

- To practise discussing, explaining and presenting chemical issues in English.
- To get an idea of how chemical principles (redox theory) are implemented to develop technically efficient devices (batteries).
- To practise setting up redox reaction equations.
- And possibly: to gain enough knowledge about batteries to be able to find out how an unknown battery functions by studying its structure and chemical composition.

Prerequisites

- To be able to identify the ions present in a salt.
- To know the most basic principles of acid-base reactions and to recognise the oxide ion as a strong base.
- To be familiar with the basic theory of redox reactions, including oxidation states, redox couples and the relative strength of oxidising or reducing agents.
- To know how the galvanic cell functions in principle.

Time requirement

- 3 lessons (2 for the expert groups, 1 for the exchange groups)

Didactic and methodical suggestions

- Before using this unit:
  1.) introduce the principle of a galvanic cell.
  2.) discuss examples of batteries, e.g. alkaline battery and lead acid battery.
- Description of the puzzle method:

  1st stage: each expert group studies one battery type; every member of the group has to understand it.

  2nd stage: exchange groups are formed so that in each group there is one expert for every battery type. One after the other, the experts present "their" battery to the other group members.

  To explain this procedure, a transparency is provided (file "Puzzle-Method.pdf").

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