RECENT DISSERTATIONS

PER-ODD EGGEN, 2010

Current Chemistry, Experiments and practice in Electrochemistry Education

Department of Chemistry, Faculty of Natural Sciences and Technology, Norwegian University of Science and Technology, Trondheim, Norway

Abstract

This thesis is concerned with experiments, models and concepts employed in electrochemistry teaching, when electrochemistry is a part of a general chemistry course in upper secondary school or at the start of university studies. The manuscripts and articles in part 2 present and discuss laboratory activities in electrochemistry. In part 1, the intention is to give a brief look at the electrochemistry section of chemistry textbooks used in general chemistry courses at Norwegian universities.

The textbook is supposed to be a main source for student's concepts and understanding in electrochemistry, and experiments provide additional understanding and training. The thesis especially concentrate on the terms, models and selection of practical experiments used, to see if these can be associated with the many problems reported concerning the understanding of concepts in electrochemistry. The papers included in this dissertation either discuss traditional educational electrochemistry experiments or propose alternative ones in order to explore possibilities to improve and increase knowledge and understanding in electrochemistry connected to practical experiments.

In Norway, chemistry as a school subject is a part of a general science course together with physics and biology until grade 12. In grade 12 and 13, chemistry is a separate subject chosen by few, but often, clever students. To enter university studies in chemistry in Norway, there is no demand to have passed the grade 12 and 13 chemistry courses. General chemistry curriculum at Norwegian universities therefore overlaps with the curriculum at grades 12 and 13. The fact that Norwegian universities use international editions of general chemistry textbooks in their courses indicates that the choice of topics and degree of challenges to some extent corresponds with university studies in chemistry in other countries.

The study of chemistry also involves different working methods. A chemistry textbook together with contributions from a teacher/lecturer, discussions among the students, laboratory work and subsequent report writing are central parts. The dissertation does not cover all of these aspects, but mainly concentrates on elements in electrochemistry education connected to experiments and related textbook sections. But some brief comments on related aspects, such as context and how the choices of topics in electrochemistry can be legitimated are included.

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Contact: *per.eggen@plu.ntnu.no*