RECENT DISSERTATIONS

MICHAL DRECHSLER, 2007

Models in chemistry education - A study of teaching and learning acids and bases in Swedish upper secondary schools

Department of Chemistry and Biomedical Sciences, Karlstad University, Sweden
Karlstad University studies 2007:13. Karlstad: Karlstad University Press.

Abstract

This thesis reports an investigation of how acid-base models are taught and understood in Swedish upper secondary school. Historically, the definition of the concepts of acids and bases has evolved from a phenomenological level to an abstract level. Several models of acids and bases are introduced in Swedish secondary school. Among them an ancient model, the Arrhenius model and the Brønsted model. The aim of this study was to determine how teachers handle these models in their teaching. Further, to investigate Swedish upper secondary students' ideas about the role of chemistry models, in general, and more specific, of models of acids and bases.

The study consisted of two parts. First, a study was performed to get an overview of how acids and bases are taught and understood in Swedish upper secondary schools. It consisted of three steps: (i) the most widely used chemistry textbooks for upper secondary school in Sweden were analysed, (ii) six chemistry teachers were interviewed, and, (iii) seven upper secondary school students were interviewed. The results from this study were used in the second part which consisted of two steps: (i) nine chemistry teachers were interviewed regarding their PCK of teaching acids and bases, and (ii) a questionnaire was administered among teachers of 441 upper secondary schools in Sweden.

The results show that most of the teachers did not emphasise a distinction between the various models of acids and bases in their teaching. For them it was sufficient to distinguish clearly between the meaning of acids and bases at the phenomenological level and at the particle level. A simple and valid argument for their preference was given: To simplify the acid-base concept and thereby facilitate learning. This study, however, shows that although students were expected to have learnt Brønsted's acid-base model, most of them had not developed a clear picture of it.

Language: English

ISBN: 978- 91-7063-116-0

Contact: michal.drechslar@kau.se

Download: <http://www.diva-portal.org/kau/abstract.xsql?dbid=783>