ED.SCI.3

# STUDENTS' UNDERSTANDING OF THE SOLUBILITY EQUILIBRIUM

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Literature review indicates that students have difficulties in understanding various chemistry concepts including the solubility equilibrium. Hence the study investigated the understanding of the solubility equilibrium by the G.C.E. Advanced Level chemistry students.

The participants of the study consisted of 665 students from the Central Province who were in their second year of advanced level. Solubility Equilibrium Concept Test (SECT) consisting of 15 open-ended items was administered to the students after they had studied the topic solubility equilibrium to identify students' difficulties in understanding the concepts and their possible sources. Responses were marked and coded into four categories: no response, misunderstanding, partial understanding and sound understanding. Semi-structured interviews were carried out with 100 students according to their written responses which reflected different perspectives, to obtain a more elaborated source of data on their underlying beliefs impacting on learning. Further ten classrooms were observed until the topic was taught completely to find more evidence on how conceptual understanding of students in solubility equilibrium was impacted by the teaching and learning process. Data collected from multiple methods were analyzed qualitatively and quantitatively.

Analysis of SECT showed that the students faced difficulty in understanding the concepts of solubility equilibrium and exhibited misconceptions in all areas in solubility equilibrium. They had more problems in understanding the areas such as dynamic nature of the solubility equilibrium, common-ion effect, selective precipitation, solving solubility product problems and understanding and interpreting graphs related to the solubility equilibrium concept. According to the findings, it was determined that students had misconceptions about the solubility equilibrium from the basic level of construction of concepts. The results indicated that misunderstandings originated from students use of rote-learning, recall and algorithmic procedures, tendency to apply macroscopic properties to the molecular level, misuse of principles and laws related to the solubility equilibrium and inappropriate generalizations of facts or formulae. Results also revealed that it was not easy to remediate or eliminate learning difficulties and misconceptions by traditional instruction used by teachers, since there was no emphasis on students misunderstandings, the important concepts being introduced by lecturing, problem solving and strictly following the textbooks which made the students passive learners. Therefore, teachers should focus more on students' prior knowledge, misconceptions and finding ways to remediate misconceptions since misconceptions prevent formation of appropriate associations between concepts and therefore hinder meaningful learning. Hence they should use alternative approaches in teaching chemistry and assessing students learning so that they can plan future activities in a way that instruction promotes meaningful learning.