



**ANALYSIS OF COMPETENCE STRUCTURE  
IN THE AREA OF COMPETENCE  
*USE OF CONTENT KNOWLEDGE IN CHEMISTRY***

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**Abstract.** In 2004 were proposed the national standards for science in Germany. For the evaluation of the proposed standards, the project Evaluation of the National Educational Standards for Natural Sciences at the Lower Secondary Level, with the acronym ESNaS, was started in 2007 (Kremer *et al.*, 2012; Kauertz *et al.*, 2010). A three-dimensional competence model was developed, with the three axes: competence area, complexity and cognitive processes. The focus of this study was the development of an instrument to assess pupils' competencies in the area of competence *use of content knowledge* in Chemistry. A number of 101 items were developed by using the ESNaS model, in order to evaluate the competence in Chemistry of High School German pupils. Items were developed on the theoretically-defined aspects of the topic *Chemical Reactions*: acid-base reactions, redox reactions, fundamentals of reactions, reactions used in analysis, organic chemistry reactions. The Rasch model was used for the analysis of data. A number of N=568 German pupils (9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> class) were tested, and it was revealed that the instrument is unidimensional and has good psychometric properties.

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