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GRAVSTOICH: AN INTERACTIVE TOOL FOR PRACTICE AND ENHANCEMENT IN STOICHIOMETRIC CALCULATIONS

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Stoichiometric calculations are both basic and the most important calculations covered in introductory chemistry. However, it is also one of the most challenging concepts taught in both high school and college/university level chemistry. Students coming from high school usually struggle to understand stoichiometric calculations; particular when dimensional analysis is applied. An interactive tool is designed for gravimetric stoichiometric calculations (GravStoich). GravStoich is designed to assist the students and guide them through stoichiometric calculations, as well as to reinforce the balancing of chemical equations and use of significant figures. GravStoich is adaptive according to students' improvement in solving the stoichiometric problems. GravStoich guides the students through the solution of the problem using three levels of assistance. Level 1 - Students are given a blank flowchart to assist in solving the gravimetric questions. Use of flowcharts helps the students to understand the logic behind the calculations involved in stoichiometric problems. Level 2 - Students are given a blank dimensional analysis set-up to assist in solving a gravimetric problem. Level 3 - Students are only provided a blank area to input the final answer to the problem. Regardless of the level of assistance, GravStoich provides a full feedback on how the problem is solved using dimensional analysis. GravStoich has the potential to be customized to any kind of chemical problems involving stoichiometric calculations: electrochemistry, gas and solution stoichiometry. GravStoich can be used on any computer platform using Adobe Flash. We believe GravStoich is an excellent interactive tool that helps to fill the gap between high school chemistry and college/university introductory chemistry courses with this challenging concept.

Biography

Elena Atrazheva has completed her PhD in Organic Chemistry from Engelhardt Institute of Molecular Biology (Moscow, Russia) and Postdoctoral studies from the Faculty of Chemistry and the Faculty of Pharmacy and Pharmaceutical studies at the University of Alberta, Edmonton, Canada. Her main research focus was on the synthesis of nucleotides and nucleosides. She has worked as a Research Scientist for several pharmaceutical companies in Canada. In 2005 she started her teaching career at the Mount Royal University as an Instructor for Organic Chemistry courses. Since 2007, she has joint the Northern Alberta Institute of Technology (NAIT) as a full-time Instructor. She is teaching introductory level courses for Organic and General Chemistry.

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