Abstract

The bachelor thesis deals with the selected collection of chemical calculations by implementing the chemical experiments to teach Chemistry effectively at secondary schools. The beginning of this bachelor thesis is to describe the types of chemical calculations included in the main areas of Chemistry taught at secondary schools. The overview is based on both expected outcomes of the Framework Education Programme for Grammar schools, Secondary Vocational schools of Chemistry and School Curriculum, including textbooks. Overview of chemical calculations has been prepared and includes: basic chemical quantities and calculations, systems of substances and their composition, balancing equations, pH calculations and thermal changes during chemical reactions. We also find a chapter on chemical experiments in the theoretical part of the bachelor thesis.

The practical part of the bachelor thesis focuses on supporting the teaching of selected chemical calculations in secondary schools through the implementation of chemical experiments. The practical part deals with designing and analysing particular laboratory assignments as a teaching method of the selected collection of chemical calculations at secondary schools. We find seven chemical experiments supporting the teaching of: molar mass and volume, substance amount and concentration, composition of solutions, balancing equations, stoichiometric calculations, pH calculations or calculations of relative yields.

Chemical experiments included in the practical part have been performed in the laboratory and evaluated by an expert. Adjustments were made and comments were incorporated after receiving an expert opinion. The above-mentioned chemical experiments are supplemented by observations and implementation experience and prepared for Chemistry lessons.

Keywords

Chemistry experiments, chemical calculations, experiments collection