Journal of the Serbian Chemical Society
JSCS@tmf.bg.ac.rs • www.shd.org.rs/JSCS
J. Serb. Chem. Soc. 80 (10) S318–S321 (2015) *Supplementary material*

SUPPLEMENTARY MATERIAL TO

Secondary-school chemistry textbooks in the 19th century

VESNA D. MILANOVIC[1#], DRAGICA D. TRIVIC[2*] and BILJANA I. TOMASEVIC[2#]

[1]*Innovation Centre of the Faculty of Chemistry, Studentski trg 12–16, Belgrade, Serbia and* [2]*University of Belgrade, Faculty of Chemistry, Studentski trg 12–16, Belgrade, Serbia*

J. Serb. Chem. Soc. 80 (10) (2015) 1321–1338

TABLE S-I. The structural and organisational components monitored in the textbooks analysed

Structural components	Organisational components
The basic text	Overview of the contents
Terms, concepts, principles, theories and laws	An introductory explanation of the textbook structure
Chemical symbols, formulas and chemical equations	Index of the terms used
Contents related to everyday life and health-related contents	Various kinds of supplementary tables
Contents related to the history of chemistry	Literature used
Precautions to be taken when dealing with certain substances	Note on the author
Pointing out new terms	
Photographs, pictures, illustrations	
Experiment descriptions	
Questions, instructions, tasks	
Referring to other parts of the book	

TABLE S-II. The quantitative data on the textbooks analysed

Quantitative data	Sima Lozanić *Chemistry for Secondary Schools*	Mita Petrović *Chemistry for Secondary Schools, Based on Prokop Prohaszka and Others*
Number of pages	163	110
Number of titles and subtitles	259	118
Number of highlighted terms	420	482
Number of terms in the index	490	439
Number of elements whose symbols, names and atomic mass are given	68	36
Number of formulas of compounds	383	202

* Corresponding author. E-mail: dtrivic@chem.bg.ac.rs

TABLE S-II. Continued

Quantitative data	Sima Lozanić *Chemistry for Secondary Schools*	Mita Petrović *Chemistry for Secondary Schools, Based on Prokop Prohaszka and Others*
Number of equations of chemical reactions	119	25
Number of experiments presented	13	29
Number of examples connecting knowledge from the sphere of chemistry with its practical application in everyday life	158	174
Number of warnings concerning the toxicity of certain substances and precautions to be taken when handling them	14	34
Number of illustrations	43	10
Number of episodes from the history of chemistry	27	2
Number of questions and instructions	5	12

TABLE S-III. The experiments described in the analysed textbooks

The experiments featured in Sima Lozanić's textbook	The experiments featured in Mita Petrović's textbook
Making a mixture of iron and sulphur	Dehydrating copper sulphate and then hydrating it anew
Heating a mixture of iron and sulphur	Making a mixture of iron and sulphur and separating its constituent from each other
Electrolysis of water, gases collected together	Heating a mixture of iron and sulphur
Dissolving salt in water and subsequent evaporation of the water	Heating tin (lead, zinc, mercury) and measuring the mass of the substance before and after the reaction
A reaction between sodium and water	Heating tin and paraffin, and measuring the mass of the substances before and after heating
Analysis of "red dust" (HgO)	Burning phosphorus inside a bell jar, investigating the characteristics of the gas left in the bell jar
Electrolysis of water, gases collected separately	Obtaining oxygen from red HgO, investigating the characteristics of oxygen
Synthesis of water	Making a mixture of nitrogen and oxygen
Obtaining hydrogen from zinc and sulphuric acid	Burning sulphur in oxygen
Obtaining chlorine from HCl and MnO_2	Burning pieces of coal on a spiral wire in oxygen
Obtaining oxygen from $KClO_3$	Electrolysis of water and investigating the characteristics of the gases obtained
	Obtaining hydrogen from zinc and sulphuric acid (prescribing the exact masses of the reactants)
	Burning hydrogen, covering the flame and obtaining water (chemical harmonica)
	Creating explosive gas in soap suds

TABLE S-III. Continued

The experiments featured in Sima Lozanić's textbook	The experiments featured in Mita Petrović's textbook
Retention of nitrogen after burning phosphorus in the air inside a bell jar Obtaining NH_3 from NH_4Cl and $Ca(OH)_2$	Obtaining NH_3 from NH_4Cl and $Ca(OH)_2$ (prescribing the exact masses of the reactants) Obtaining hydrogen from KOH (prescribing the exact masses of the reactants) and nitrogen from KNO_3 and iron (prescribing the masses of the reactants) and their reaction The neutralisation reaction of ammonia and sulphuric acid Obtaining chlorine from HCl and MnO_2, and investigating its characteristics Obtaining HCl from table salt, water and sulphuric acid Obtaining HFl from $CaFl_2$ and H_2SO_4 Obtaining H_2S from FeS and HCl in a Woulff bottle Sedimentation of Ag_2S, PbS, As_2S_3 Obtaining HNO_3 from KNO_3 and H_2SO_4 Obtaining NO from copper and nitric acid Obtaining CO_2 from $CaCO_3$ and HCl, and investigating its characteristics Decomposition of $CaCO_3$ and the reaction of its product with water Obtaining KOH by boiling K_2CO_3 with $Ca(OH)_2$ Reactions of various sugars with NaOH in $CuSO_4$ Making colour from indigo, $FeSO_4$ and NaOH (prescribing the exact masses)

TABLE S-IV. Questions and instructions found in Sima Lozanić's and Mita Petrović's textbooks

Sima Lozanić's textbook	Mita Petrović's textbook
1) Does the matter of water change when it freezes and when it evaporates? 2) Is it possible to decompose mercury, hydrogen and oxygen into even simpler components? 3) Do these elements of ours make up other cosmic bodies as well? 4) Is the composition of compounds permanent, which is to say, do they always contain the same elements, joined in the same ratio?	1) In what order shall we arrange the halogen elements based on the strength of their affinity? 2) What are the molecular weights of H_2O and NH_3? 3) What are the molecular weights of oxygen and hydrogen? 4) Thus the volume weight of steam equals 9, as we have seen before. Why? 5) What are the volume weights of HCl and NH_3? 6) Thus all chlorides, iodides, bromides, fluorides and sulphides are salts. What acids are they created from? How shall we explain this process? Which of these salts are already familiar to us? Write their chemical formulas, along with the formulas of their acids.

TABLE S-IV. Continued

Sima Lozanić's textbook	Mita Petrović's textbook
5) What keeps molecules and atoms bound together?	7) Sulphuric carbon burns with a bluish flame. What are the products of its burning? 8) According to this, in how many ways could we put out a fire? 9) Sodium occurs in compounds only, and is obtained artificially in the same way as potassium is obtained from its carbonate. What is the chemical equation of this process? 10) $BaCl_2$ and $Ba(NO_3)_2$ are important as reagents to H_2SO_4 and sulphates, with which they produce a heavy white sediment. What is the composition of the sediment? 11) When aluminium sulphate is mixed with sodium sulphate or ammonia sulphate, what is created sodium or ammonia alum. Write their formulas. 12) Galenite is melted with iron particles, which extract sulphur from it through the greater intensity of its affinity. What is the Equation of this reaction?