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With this publication, the CD with all papers from the International Conference on Information Technology and Development of Education, ITRO 2017 is also published.

INTRODUCTION

The Technical Faculty "Mihajlo Pupin", Zrenjanin, of the University of Novi Sad, the Republic of Serbia organizes VIIIth International Scientific Professional Conference "Information Technologies and Development of Education 2017" (ITRO 2017). The Conference will be held on 22nd June 2017 at the Technical Faculty "Mihajlo Pupin" in Zrenjanin, Serbia.

The Conference "Information Technologies and Development of Education 2017" (ITRO 2017) is organized due to the needs to connect science, profession and education through topics and content concept, first of all concerning the teaching process as base of information society. The tendencies of developed countries are in accordance with the efforts of UNESCO to improve this area related to the needs of life and work in the XXIst century. It is necessary to assess the state, detect the problems and perspectives of the development of education by competent professionals and teachers as well as the influence of the development of education on the development of the society as a whole.

The central topic of the meeting is the model of dual education as base for creating good base for the development of industry. Thus, our aim is to gather the representative entities who are able constructively contribute to establishing link between the educational system and industry as follows: Chamber of Commerce of Serbia – Centre for Dual Education, Ministry of Education, Science and Technological Development, Union of Employers of Serbia, ZREPOK – Business Organization of Zrenjanin and Companies that run their business in the region, directors of grammar schools and secondary vocational school, members of the academic communities and other participants who are interested in the topics.

The main topics of the scientific professional conference are:

- Model of dual education
- Teaching based on the concept of entrepreneurship

Other thematic areas of the Conference:

- Theoretical and methodological questions of contemporary Pedagogy
- Digital didactics media
- Contemporary communication in teaching
- Curriculum of contemporary teaching
- Developing teaching
- E-learning
- Management in Education
- Teaching methods of natural and technical subjects
- Information-communication technologies

The Chairman of the Organizing Committee of the ITRO 2017 Prof. Dragana Glušac opened the Conference. The participants were addressed by the vice dean of the Technical Faculty »Mihajlo Pupin«, Prof. Dijana Karuović; provincial secretary for science, higher education and scientific Research prof. Zoran Milošević, and the vice-major of Zrenjanin Mr. Dusko Radisic.

There were total of 143 authors that took part at the Conference from 12 countries, 2 continents: 82 from the Republic of Serbia and 61 from foreign countries such as: Macedonia, Bulgaria, Slovakia, Austria, Cyprus, Albania, Hungary, Spain, Bosnia and Herzegovina, USA, Portugal.

The Proceedings of papers contains 60 papers and it has been published in the English language.

President of the Organizing Committee
Prof. dr Dragana Glusac

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CONTENTS

Application of Matlab Redefined and Modified Applications to Solve Problems of Interaction of Chemical Elements and Their Impact on the Environment

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Abstract - This paper presents package of tools that provide adequate information and data on the interactions of certain chemical elements and compounds (reagents) and their technical - technological impact on both an experimental and industrial process. These applications allow appropriate tabular and graphical representation of certain kinetic models, which are in function and application in the educational process in the form of analytical and experimental research in subjects like chemistry and environmental protection.

I. INTRODUCTION

This paper is about a process called - Froth flotation for selectively separating hydrophobic materials from hydrophilic. This is used in mineral processing, paper recycling and waste-water treatment industries. Historically this was first used in the mining industry, where it was one of the great enabling technologies of the 20th century. It has been described as "the single most important operation used for the recovery and upgrading of sulfide ores". The development of froth flotation has improved the recovery of valuable minerals, such as copper- and lead-bearing minerals. Along with mechanized mining, it has allowed the economic recovery of valuable metals from much lower grade ore than previously. Froth flotation is a process for separating minerals from gangue by taking advantage of differences in their hydrophobicity. Hydrophobicity differences between valuable minerals and waste gangue are increased using surfactants and wetting agents. The selective separation of the minerals makes processing complex (that is, mixed) ores economically feasible. The flotation process is used for the separation of a large range of sulfides, carbonates and oxides prior to further refinement.

II. DEVELOPING A SYSTEM OF THINKING

In the existing equations for flotation kinetic the assumption is such that velocity coefficient for any sulphide minerals is the constant k. The number of investigators, as A. Gupta, D.S. Juan had calculated the of group models cumulative flotation from first order considering the following models:

- Classical kinetic model, $I=I_o[1-e^{-kt}]$
- Klimpel kinetic model, $I=I_o[1-\frac{1}{kt}(1-e^{-kt})]$
- Kelsal kinetic model, $I = (i_o-\phi)(1-e^{-kft})+ (1-e^{-kst})$
- Modified Kelsal kinetic model – Gama model from Loveday, Innou, $I=I_o(1-(\frac{k}{k+t})^P)$

The mentioned kinetic models are appropriate for presentation the flotation kinetic, very important for everyone project solution or assumption for good and sure flotation performance. According to the previous kinetic investigations for kinetic flotation (Classical kinetic model) for different sulphide, minerals for copper mineral will have the following equation (chalcopyrite):

$$I = Io\ [1-\varepsilon-\kappa\tau] = 89.25\ [1 \square \varepsilon- 1.025\xi\tau] \qquad (1)$$

According to previous kinetic investigations for kinetic flotation (Classical kinetic model) for different oxide – sulphide minerals constant k for copper mineral will have the following equation (65% chalcopyrite and 35% oxide minerals as cuprite, azurite, and malachite):

$$I = Io\ [1-\varepsilon-\kappa\tau] = 73.5\ [1 \square \varepsilon- 0.56\xi\tau] \qquad (2)$$

According to the existing kinetic investigations for kinetic flotation (Classical kinetic model) for different oxide – sulphide minerals constant k for copper mineral will have the following equation (65% chalcopyrite and 35% oxide minerals as cuprite, azurite, malachite), but with application of process of sulphidization with Na2S, (NH4)2SO4, NH2SO4 :

$$I = Io\,[1-\varepsilon-\kappa\tau] = 74.2\,[1 \square\ \varepsilon - 0.61\xi\tau] \qquad (3)$$

III. KINETIC FLOTATION MODELING OF CHALCOPYRITE USING SOFTWARE TOOLS

The software package for kinetic flotation modeling in MATLAB®(R) GUI, was enabling appropriate tabular or graphic presentation for Classical kinetic model (I. Brezani, F. Zelenek), determining the constant k in the function of the time frequency of the useful reagent addition.

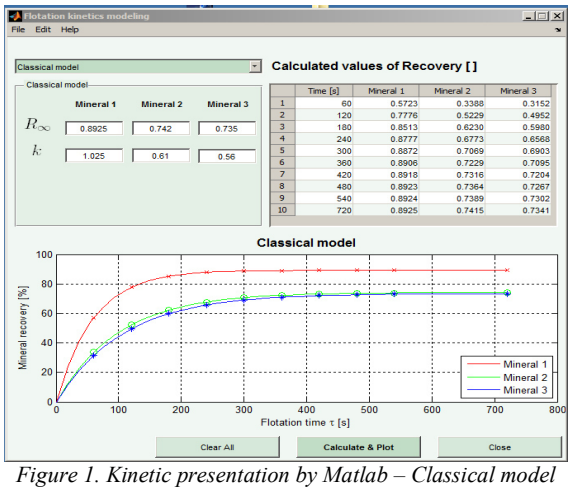


Figure 1. Kinetic presentation by Matlab – Classical model

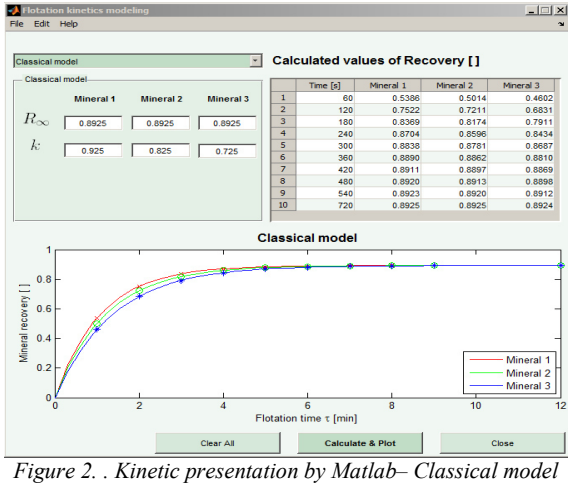


Figure 2. . Kinetic presentation by Matlab– Classical model

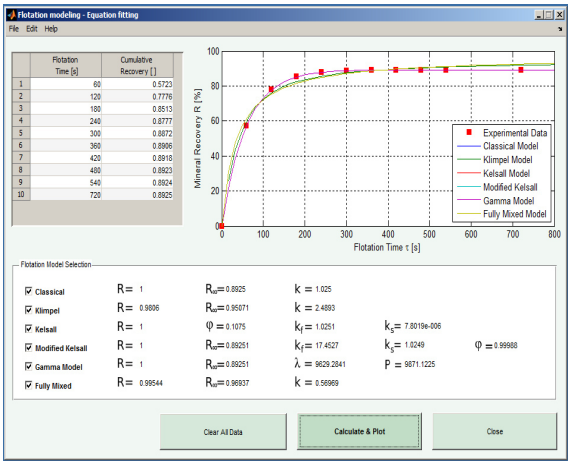
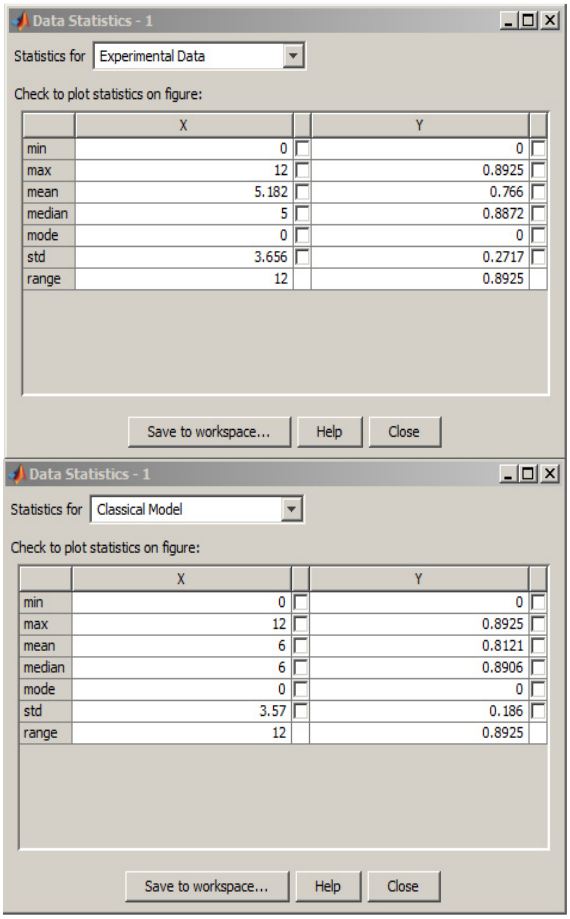


Figure 3. Kinetic presentation by Matlab



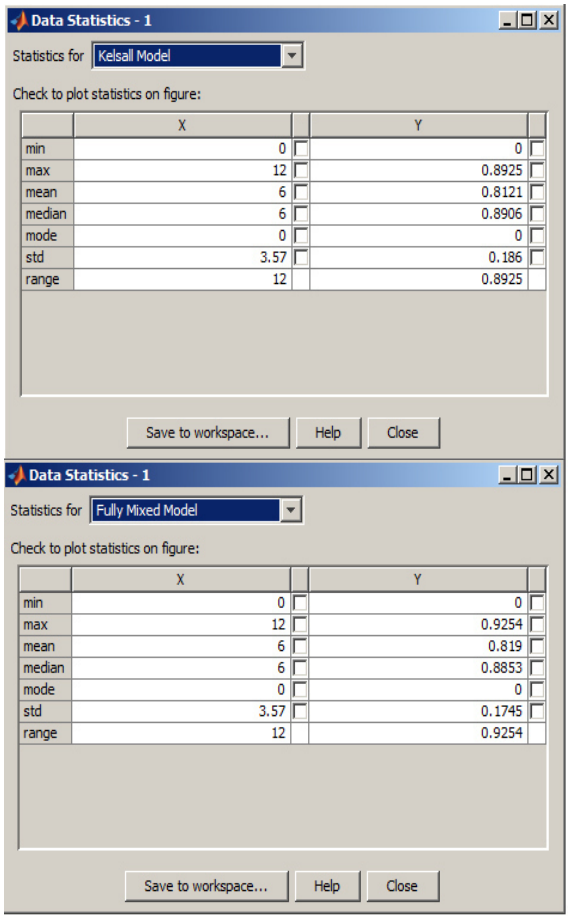


Figure 4. Results in total – comparison for all models

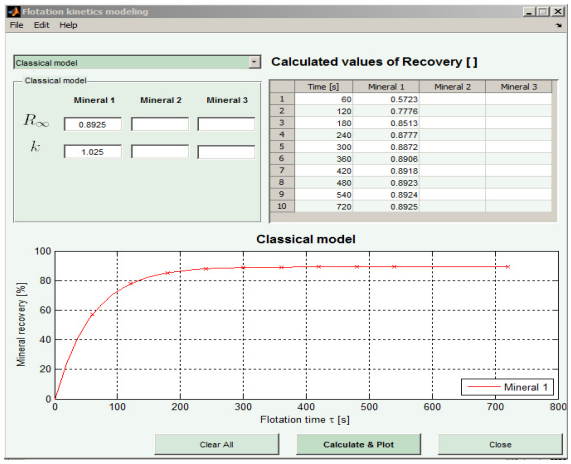


Figure 5. Kinetic presentation by Matlab

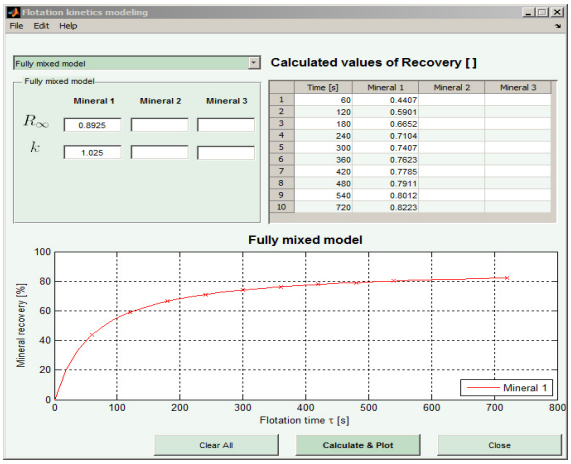


Figure 6. Kinetic presentation by Matlab

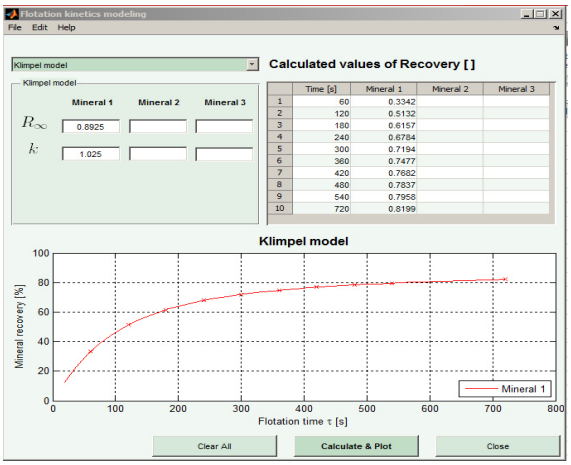


Figure 7. Kinetic presentation by Matlab

IV. CONCLUSION

The impact of using this type of applications leads to predictive analyzing some industrial processes that have some type of environmental impact on the environment. By using this type of resource is underpinned determining the desired or required results before they are put into use in industrial processes. The process of flotating can cause a type of environmental impact to the environment and therefore recommended the use of software tools that give insight to a small part of the process which is crucial both for the industry and for the environment as protection process one environment.

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