

2018
№1

VOLUME 53
ISSUE 1, 2018



ISSN 1314-7471 (print)
ISSN 1314-7978 (on line)
<http://dl.uctm.edu/journal/>

JOURNAL

**OF CHEMICAL TECHNOLOGY
AND METALLURGY**



SOFIA 2018

VOLUME 53

2018

ISSUE 1

<http://dl.uctm.edu/journal/>

ISSN 1314-7471 (print)

ISSN 1314-7978 (on line)

JOURNAL OF CHEMICAL TECHNOLOGY AND METALLURGY

SOFIA

455000, МАГНИТОГОРСК, пр. Ленина, 38
БИБЛИОТЕКА
Магнитогорского государственного
технического университета им. Г.И. Носова

TABLE OF CONTENTS

Dear readers Prof. Dr. Iskander Beisembetov, Rector of Satbayev University.....	3
Satbayev University, Almaty, Kazakhstan History, educational and scientific activities.....	5
Biocatalytic activity of various biopolymeric complexes with transient metal ions Nazym M. Zhunusbekova, Nurzhan S. Chinibayeva, Zhanar M. Zhaksybayeva, Zoya K. Tuiebakhova, Tynyshtyk K. Iskakova, Gaukhar M. Kashakova, Nazgul N. Torekhan.....	9
Hydrogenation of nitroaromatic compounds by gold nanoparticles immobilized within macroporous amphoteric cryogels in aqueous solutions Madi Aldabergenov, Moldir Dauletbekova, Alexey Shakhvorostov, Gaukhar Toleutay, Alexey Klivenko, Sarkyt Kudaibergenov.....	17
Application of hydrolytic precipitation for separation of rare-earth and impurity elements Sultan Yulusov, Tatyana Y. Surkova, Vladlen A. Kozlov, Madina Barmenshinova	27
Pillar structural bentonite for obtaining dimethyl ether from natural gas Maxat Myrzakhanov, Yergali Markayev, Kenzhe Shekeyeva, Bolysbek Utelbayev.....	31
Characterisation of solid sulfur in the Tengizchevroil Seitzhan A. Zaurbekov, Nina I. Chugunova, Gulnur S. Tatichanova, Meroy E. Nursultanov.....	37
A new monoalkyl phosphate ester based on a product derived from the recycling of a postconsumer polyethylene terephthalate waste Assem K. Merekenova, Galina I. Boiko, Sergey A. Dergunov, Raushan G. Sarmurzina, Uzakbay S. Karabalin, Nina P. Lubchenko.....	43
Synthesis, characteristics and antibacterial activity of polymeric films based on starch and polyvinyl alcohol Sana K. Kabdrakhmanova, Esbol Shaimardan, Kydyrmolla Akatan, Ainur K. Kabdrakhmanova, Nurgamit Kantai, Madi B. Abilev.....	50
Investigation and development of the technology for integrated processing of wastes from phosphorous industry Malik N. Abdikarimov, Khalima Kh. Turgumbayeva, Tuleuzhan I. Beisekova, Irina Z. Lapshina, Raushan Kh. Turgumbayeva, Umbetaly K. Sarsambin, Maxat Zh. Shanbayev, Zhuldyz U. Abdualiyeva.....	61
Application of sol-gel transition of gellan and xanthan for enhanced oil recovery and as drilling fluids Zhanara Nurakhmetova, Iskander Gussenov, Vladimir Aseyev, Vladimir Sigitov, Sarkyt Kudaibergenov.....	68
On sorption of the rare-earth elements Sultan Yulusov, Tatiana Y. Surkova, Leila U. Amanzholova, Madina B. Barmenshinova.....	79
Synthesis of water soluble copolymers and their interpolymer complexes with poly(acrylic acid) Ulantay Nakan, Raikhan Rakhmetullaeva, Grigory A. Mun, Gulzhakhan Zh. Yeligbaeva, Aigul A. Amitova, Balgyn Tolkin, Erengayf M. Shaihutdinov, Meroy E. Nursultanov, El-Sayed Moussa Negim.....	83

Influence of polyacrylic acid hydrogel's swelling degree on sorption ability of intergel system polyacrylic acid hydrogel – poly-4-vinylpyridine hydrogel in relation to neodymium ions
Talkybek K. Jumadilov, Ruslan G. Kondaurov, Serik S. Kozhabekov, Gauhar A. Tolegen,
Gauhar K. Eskalieva, Sergali A. Khakimzhanov.....88

Sorption removal of Pb^{2+} , Cd^{2+} , Cu^{2+} from diluted acid solution by chitosan modified zeolite
Marzhan Zh. Kussainova, Raisa M. Chernyakova, Umirzak Zh. Jussipbekov, Hamdi Temel,
Salih Pasa, Raushan A. Kaiybayeva, Aktolkyn A. Agatayeva.....94

On increase of the efficiency of extracting phenolic compounds from palm oil mill effluent
Saifuddin Nomanbhay, Saltanat A. Uskenbayeva, M.Y. Ong.....101

On the process of phosphate ions removal from cottrel milk
Saltanat A. Uskenbayeva.....112

New generation of energy accumulating substances on the basis of activated aluminum
Raushan G. Sarmurzina, Galina I. Boyko, Meirzhan T. Baigazyev,
Uzakbai S. Karabalin, Nina P. Lubchenko.....119

Surface - active copolymers of vinyl ethers
Sara Khussain, Yerengaip Shaikhutdinov, Nurgul Seitkaliyeva, Akbota Zhenisova.....125

A new approach to expansion of Baldwin-Aibassov's rules concerning the ring-closing reaction
of the d- and f-elements of the periodic table of elements
Yerkin Aibassov, Valentina Yemelyanova, Maxat Bulenbayev,
Ruslan Nurlybaev, Bagdat Altaibayev.....132

Guide for Authors.....135

2018
№2

VOLUME 53
ISSUE 2, 2018



ISSN 1314-7471 (print)
ISSN 1314-7978 (on line)
<http://dl.uctm.edu/journal/>

JOURNAL

OF CHEMICAL TECHNOLOGY AND METALLURGY



SOFIA 2018

VOLUME 53

2018

ISSUE 2

<http://dl.uctm.edu/journal/>

ISSN 1314-7471 (print)

ISSN 1314-7978 (on line)

JOURNAL OF CHEMICAL TECHNOLOGY AND METALLURGY

SOFIA

455000, МАГНИТОГОРСК, пр. Ленина, 38
БИБЛИОТЕКА
Магнитогорского государственного
технического университета им. Г.И. Носова

TABLE OF CONTENTS

Synthesis and energy transfer properties of fluorescence sensing bifluorophore based on 2-aminodimethylterephthalate and 3-aminobenzanthrone Polya Miladinova.....	139
A novel 1,8-naphthalimide probe for selective determination of Hg ²⁺ in a wide pH window Paoleta V. Krasteva, Margarita D. Dimitrova, Nikolai I. Georgiev, Vladimir B. Bojinov.....	150
Chemistry and health impacts of <i>trans</i> fatty acids Alemayehu Gashaw, Million Getasetegn.....	159
Elaboration and rheological study of a new trifunctional polyepoxide macromolecular binder Rachid Hsissou, Ahmed El Harfi	170
Extraction of phenolic and flavonoid compounds from solid wastes of grape seed oil production by cold pressing Ilonka Saykova, Bartos Tylkowski, Cristina Popovici, Georgi Peev.....	177
Peculiarities of the process of destruction of stable water-oil emulsions in intermediate layers Olga Yu. Sladovskaya, Dmitry G. Tsyganov, Natalia Yu. Bashkirtseva, Aliya A. Mukhametzyanova.....	191
Removal of heavy metal ions from wastewater using conventional and nanosorbents: a review Katerina Atkovska, Kiril Lisichkov, Gordana Ruseska, Aleksandar T. Dimitrov, Anita Grozdanov.....	202
Equilibrium and kinetic study on hexavalent chromium sorption on bentonite supported zero valent iron Dashjargal Arildii, Sarangerel Davaasambuu, Sukhbaatar Batchuluun.....	218
A possible use of raw and treated kalimantan sub-bituminous coal as colour adsorbent in aqueous solutions Galuh Yuliani, Amallia Yuliana, Agus Setiabudi, Anggoro Tri Mursito.....	232
Waste resources utilization for zeolite A synthesis Nada S. Ahmedzeki, Marwa N. Abbas, Ahmed M. Joodee, Yasamin M. Jaed.....	239
Treatment of wastewaters containing Fe, Cu, Zn and As by microbial hydrogen sulfide and subsequent removal of COD, N and P Svetiana Bratkova, Silviya Lavrova, Anatoliy Angelov, Katerina Nikolova, Rosen Ivanov, Bogdana Koumanova.....	245
Composition of water and peloid from lake Buuntsagaan and element accumulation of peloid Baasankhuu Tserenkhand, Zandraa Badnainyambuu, Gongor Erdenechimeg, Oyuntsetseg Bolormaa.....	258
Passive air sampling monitoring of POPs in southeastern Europe at high mountain station BEO - Moussala, Bulgaria Nina Nikolova, Silviya Lavrova-Popova, Plamena Petkova, Stefan Tsakovski, Petra Pribylova.....	267
Effect of expanded vermiculite and expanded perlite as pore forming additives on the physical properties and thermal conductivity of porous clay bricks Angel Georgiev, Albena Yoleva, Stoyan Djambazov, Dimitar Dimitrov, Valentina Ivanova.....	275
Development and investigation of pyrotechnic gas generating burning compositions Marat Tulepov, Dauren Baiseitov, Larissa Sassykova, Yuri Kazakov, Sholpan Gabdrashova, Zulkhair Mansurov, Alan Dalton.....	281

Development and testing of catalysts on metal block carriers for exhaust gases neutralization Larissa Sassykova, Arailym Nalibayeva.....	289
Removal of impurities from talc ore by leaching method Kianoush Barani, Valeh Aghazadeh.....	296
Nickel ferrite formation at low temperature Liliya Frolova, Alexander Baskevich.....	301
Enhancing the energy and environmental efficiency of the fire refining of blister copper in anode furnace Part I: Optimization of the heat generation in the operations area of the furnace Daniela Choshnova, Peter Iliev.....	306
Comparative analysis of electrochemical corrosion behavior and inhibition of 2101 duplex and 301 austenitic stainless steel in 4-cyanobenzene/6M H ₂ SO ₄ solution Roland Tolulope Loto.....	311
Two derivatives of 7-amino-thiazolo[3,2-a]pyrimidine as inhibitors of mild steel corrosion in 1.0 M HCl solution: Part I: Synthesis of inhibitors and electrochemical study Houda Serrar, Mouhsine Galai, Fouad Benhiba, Moussa Ouakki, Zakaria Benzekri, Said Boukhris, Amina Hassikou, Abdelaziz Souizi, Hassan Oudda, Mohamed Ebn Touhami.....	324
4-hydroxy-3-methoxybenzaldehyde as a volatile inhibitor on the atmospheric corrosion of carbon steel Victoria Vorobyova, Olena Chygyrynets, Margarita Skiba.....	336
Ultrasonic NDT of steel: effect of the grain size on the ultrasonic propagation and attenuation Francesco Bonifazi, Pietro Burrascano, Andrea Di Schino, Sabrina Mengaroni, Federico Petrucci, Marco Ricci, Luca Senni.....	346
Comparison of results of dynamic recrystallization research of HC420LA steel by two types of tests on Gleeble 3800 Tatiana Zhuchkova, Sergey Aksenov, Valeriy Shkatov, Igor Mazur.....	354
Efficiency of metal deformation in the exhaust calibers at rolling of reinforcing profile from the initial workpiece of larger sizes Olga N. Krivtsova, Sergey N. Lezhnev, Toncho A. Koinov, Sergey S. Mikheev, Viktoria M. Tsyganova.....	360
Development of the model of cold rolling process in dynamic conditions Aleksandr V. Kozhevnikov, Irina A. Kozhevnikova, Nataliya L. Bolobanova.....	366
Engineering method of determination of thermal bulge of work rolls of the hot rolling mill Sergey M. Belsky, Sergey N. Lezhnev, Evgeniy A. Panin.....	373
Numerical simulation laboratory hot rolling process of a round bars in flat rolls Dmitrii Demin, Ivan Zakhariev, Taisia Labutina, Anna Levikina.....	380
TEM SAED analysis of (Yb, Na)-co-doped lasing fluoride crystals Svilen M. Gechev, Hristo L. Iliev, Tsvetomir M. Gechev.....	386
Influence of aromatics content in the feed stream on HF-catalyst regenerator and linear alkylbenzenes sulphonation reactor stability Irena Dolganova, Elena Ivashkina, Emilia Ivanchina, Igor Dolganov.....	390
Guide for Authors.....	395

2018
N3

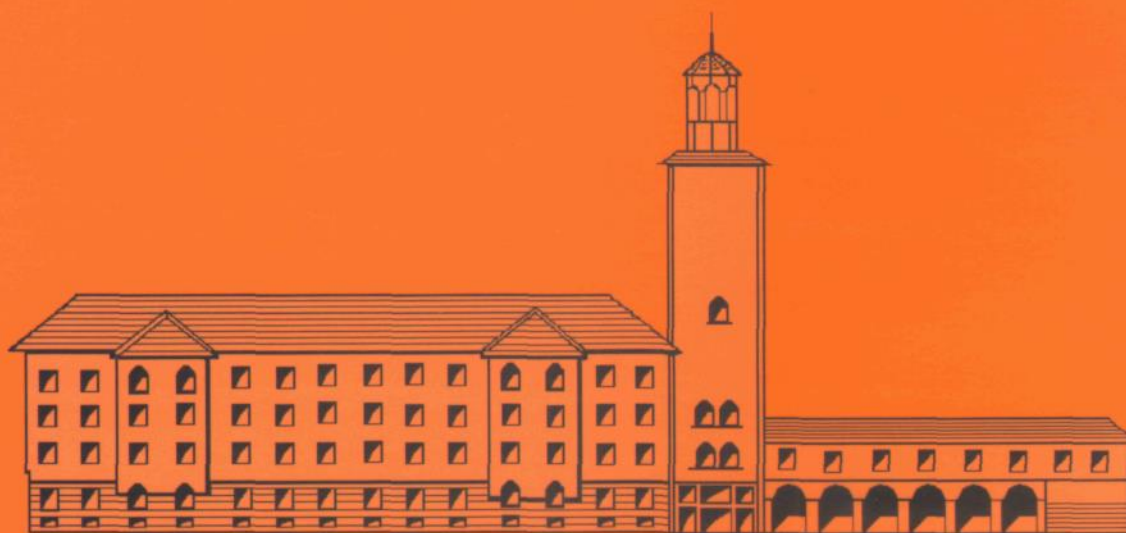
VOLUME 53
ISSUE 3, 2018



ISSN 1314-7471 (print)
ISSN 1314-7978 (on line)
<http://dl.uctm.edu/journal/>

JOURNAL

OF CHEMICAL TECHNOLOGY AND METALLURGY



SOFIA 2018

VOLUME 53

2018

ISSUE 3

<http://dl.uctm.edu/journal/>

ISSN 1314-7471 (print)

ISSN 1314-7978 (on line)

JOURNAL OF CHEMICAL TECHNOLOGY AND METALLURGY

SOFIA

455000, МАГНИТОГОРСК, пр. Ленина, 38
БИБЛИОТЕКА
Магнитогорского государственного
технического университета им. Г.И. Носова

TABLE OF CONTENTS

Studies on natural rubber based composites filled with products from renewable resources with improved adhesion to icy surfaces Nikolay Dishovsky, Filis Mitkova, Yordan Angelov, Mara Kandeve, Latinka Vladimirova.....	399
Low adhesive surfaces for biofouling control Todorka G. Vladkova.....	408
Synthesis and characterization of a new epoxy resin homologous of DGEBA: diglycidyl bis disulfide carbon ether of bisphenol A Rachid Hsissou, Atiqa Bekhta, Ahmed El Harfi.....	414
A study of properties of road petroleum bitumen modified with polymer additives Ayaz I. Abdullin, Elena A. Emelyanycheva.....	422
Enrichment of nutritional contents of sawdust by composting with other nitrogen rich agro-wastes for bio-fertilizer synthesis Asadu Christian Oluchukwu, Aneke Gibson Nebechukwu, Samuel O. Egbuna.....	430
Factorial design study of P ₂ O ₅ reduction for Jordanian phosphogypsum using sulfuric and nitric acids solutions Mohammad A. Aliedeh.....	437
Synthesis of pyrrole and substituted pyrroles (review) Diana Tzankova, Stanislava Vladimirova, Lily Peikova, Maya Georgieva.....	451
Spectroscopic and voltamperometric studies of Cu(II) complex with 3-amino-5,5-diphenylhydantoin Stela Georgieva, Petar Todorov.....	465
Sulfur doped fluorescent carbon dots as nanosensors for rapid and sensitive monitoring of calcium in hard water Alexandre Loukanov, Polina Mladenova, Hibiki Udono, Zsombor Miskolczy, Anatoly Angelov, László Biczók, Seiichiro Nakabayashi.....	473
Characterisation of Karaçeva bentonite by chemical composition, granulometric analysis and Mössbauer spectroscopy Mehush Aliu, Mensur Kelmendi, Luljeta Pula-Beqiri, Milaim Sadiku, Sadija Kadriu.....	480
Simultaneous removal of Cu ²⁺ and SO ₄ ²⁻ using Ba ²⁺ - modified clinoptilolite from aqueous medium Silviya Lavrova-Popova, Grigor Hlebarov.....	486
Study on the metalworking wastewater pre-treatment using Fenton's reaction Kristina Gerulová, Maroš Soldán.....	491
Sensors applicability for PM _{2.5} and PM ₁₀ air concentration measurements Nina Ilieva, Yana Nikolova, Ivaylo Predyov, Nikolay Kozarev.....	496
Usage of the sludge from water treatment plant in brick-making industry Yousif Algamal, N. M. Khalil, Qayid M. Saleem.....	504

Numerical simulation of bubble breakup and coalescence in bubbling two-phase flow Dessislava Moutafchieva, Veselin Iliev.....	511
Magneto hydrodynamic double-diffusive convection in fluid saturated inclined porous cavity with thermal radiation and chemical reaction Balla Chandra Shekar, Chinthapally Haritha, Naikoti Kishan.....	518
Synthesis of catalysts on the metal block carriers and testing their effectiveness in the real conditions of operation Larissa Sassykova, Vladimir Bunin, Arailym Nalibayeva, Meruyert Nurakhmetova.....	537
Use of the nanostructured soot in gas generators for processing of a bottomhole zone of oil wells Dauren Baiseitov, Sabit Tursynbek, Marat Tulepov, Larissa Sassykova, Meruyert Nazhipkyzy, Sholpan Gabdrashova, Yuri Kazakov, Igor Pustovalov, Fedosya Abdrakova, Zulkhair Mansurov, Alan Dalton.....	543
Kinetics of electrodeposition of NiP, CoP and NiCoP coatings depending on sodium hypophosphite concentration Katya Ignatova, Yordanka Marcheva.....	549
Electrochemical recovery of gold from concentrate by using sulfur-graphite electrode as the leaching agent source Rashid K. Nadirov, Leila I. Syzdykova, Aisulu K. Zhussupova.....	556
Study of soda effect on the sintering process of low titanium slag Galymzhan Maldybayev, Madali Naimanbaev, Irina Shadrunkova, Nyna Lokhova, Rustam Sharipov.....	564
Extraction and separation studies of Ce (III) from acidic nitrate medium with binary mixture of Aliquat 336 and Cyanex 921 in kerosene Sujata Mishra, Sushanta Kumar Sahu.....	572
Process optimization of hydrochloric acid leaching of iron from Agbaja clay Onukwuli Okechukwu Dominic, Udeigwe Uchenna, Ude Callistus Nonso.....	581
Effect of furnace temperature on iron nugget production under semi-fusion conditions Yunus Emre Benkli, Mustafa Boyrazli, Zeki Cizmecioglu.....	590
Two derivatives of 7-amino-thiazolo[3,2-a]pyrimidine as inhibitors of mild steel corrosion in 1.0 M HCl solution Part II: Adsorption and quantum chemical studies Houda Serrar, Mouhsine Galai, Fouad Benhiba, Moussa Ouakki, Zakaria Benzekri, Said Boukhris, Amina Hassikou, Abdelaziz Souizi, Hassan Oudda, Mohamed Ebn Touhami.....	597
Microstructure and mechanical properties of austenitic stainless steel AISI-321 after radial shear rolling Abdrakhman Nayzabekov, Sergey Lezhnev, Oleg Maksimkin, Kira Tsai, Eugeniy Panin, Alexandr Arbuz.....	606
Effect of the heat treatment on the microstructure and mechanical properties of the Al - 12 mass % Si alloy welded Bouremel Cherifa, Sakri Adel.....	612
Guide for Authors.....	619

ab.

VOLUME 53
ISSUE 4, 2018



ISSN 1314-7471 (print)
ISSN 1314-7978 (on line)
<http://dl.uctm.edu/journal/>

JOURNAL

OF CHEMICAL TECHNOLOGY AND METALLURGY



SOFIA 2018

JOURNAL OF CHEMICAL TECHNOLOGY AND METALLURGY

PROCEEDINGS

SCIENTIFIC CONFERENCE

**"25 YEARS OF FRANCOPHONE ENGINEERING PROGRAMME
AT UNIVERSITY OF CHEMICAL TECHNOLOGY AND METALLURGY"**

27-29 September, 2017

Sofia, Bulgaria

SOFIA

455000, МАГНИТОГОРСК, пр. Ленина, 38
БИБЛИОТЕКА
Магнитогорского государственного
технического университета им. Г.И. Носова

TABLE OF CONTENTS

Plant mediated synthesis of silver nanoparticles using extracts from <i>Tilia cordata</i> , <i>Matricaria chamomilla</i> , <i>Calendula officinalis</i> and <i>Lavandula angustifolia</i> flowers Borislava Mladenova, Svetlomir Diankov, Maria Karsheva, Simeon Stankov, Ivaylo Hinkov.....	623
Optimization of extraction of antioxidants from Bulgarian Mavrud by-products Vanya Dimcheva, Maria Karsheva, Svetlomir Diankov, Ivaylo Hinkov.....	631
Green extraction of high added value substances from spent coffee grounds: preliminary results Silvia S. Georgieva, José A.P. Coelho, Filipe C. Campos, M. Paula Robalo, Roumiana P. Stateva.....	640
Binary adsorption of copper and sulfates on barium-modified clinoptilolite Silviya Lavrova-Popova, Zvezdelina Yaneva.....	647
Removal of pesticides and desethylatrazine (DEA) by nanofiltration: Effects of organic and inorganic solutes on solute rejection Ibrahim Musbah, Delphine Cicéron, Abdellah Saboni, Silvia Alexandrova.....	657
The influence of surfactants on the drainage and rupture of mobile liquid films between drops: A parametric numerical study Silvia Alexandrova, Maria Karsheva, Aleksandar M. Spasic, Abdellah Saboni.....	664
Dual-mode distributed model predictive control of a quadruple-tank system Alexandra Grancharova, Tor A. Johansen, Sorin Olaru.....	674
Microbial production of 1-butanol – recent advances and future prospects Flora Tsvetanova, Penka Petrova, Kaloyan Petrov.....	683
Application of three-stage approach to isolation and purification of <i>Pseudozyma antarctica</i> lipase B Borislav Borisov, Daniela Manova, Spaska Yaneva, Dancho Danalev, Lyubov Yotova.....	697
Copper phytofiltration and sulfates removal from aqueous media in subsurface vertical flow wetland by <i>Phragmites australis</i> Silviya Lavrova-Popova, Grigor Hlebarov.....	706
Chemical composition of different types of compost Metodi Mladenov.....	712
Calibration of GC/MS method and validation of the modified sample preparation for determination of polycyclic aromatic hydrocarbons Ivan Givechev, Dancho Danalev, Spaska Yaneva, Dimitar Tanev.....	717
First steps of development of a method for simultaneous determination of cholesterol and fatty acids in food matrices Hayssam El Mazbouh, Ivan Givechev, Dimitar Tanev, Spaska Yaneva, Dancho Danalev.....	725
Spectroscopic study of the template synthesized intermetallic (Co-Sn, Ni-Sn, Co-Ni) nanoparticles with a carbon support Ivania Markova, Mehmet Piskin, Ivan Zahariev, Dimka Ivanova, Ludmil Fachikov, Evangelis Christoforou.....	729

TABLE OF CONTENTS

Effect of the potential on the film composition and the stress corrosion cracking of mild steel in ammonium nitrate solutions
 Dimka I. Ivanova, Ludmil B. Fachikov.....740

Optical and color characteristics of porous alumina with electrochemically incorporated silver
 Denitsa Kiradzhyska, Rositsa Mantcheva, Christian Girginov, Stephan Kozhukharov.....745

Structural investigation of tellurium based thin films
 Vladislava Ivanova, Yordanka Trifonova, Vanya Lilova, Valdec Mikli, Angelina Stoyanova-Ivanova.....749

Physico-chemical characterization of new tellurium based chalcogenide materials
 Yordanka Trifonova, Vladislava Ivanova, Vanya Lilova, Desislava Vasileva, Tanya Boteva.....755

Glass-crystall materials containing $\text{Bi}_{12}\text{TiO}_{20}$ and $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ phases obtained from freelycooled melts of Bi_2O_3 - TiO_2 - SiO_2 - Nd_2O_3 system
 Stanislav Slavov, Zheng Jiao.....759

Contribution to strengthened reinforced concrete structures by externally bonded carbon fibres fabrics
 Dimitar Dontchev, Ivelina Ivanova, Jules Assih.....765

Green business management as a business opportunity for small and medium-size enterprises in polymer industry
 Elka Vasileva, Yuliya Hristova-Pesheva, Daniela Ivanova.....773

Student-centered learning in a bilingual environment – a possible approach to achieve specific goals in engineering education
 Veselina Kolarski, Dancho Danalev, Senia Terzieva.....782

Guide for Authors.....787

Application of three-stage approach to isolation and purification of V_2O_5 from waste
 Borislava Boneva, Daniela Manova, Spaska Jangova, Jaschka Jankov, Lyubov Yotova, Lyubomir Chibrikov, Chiril-Dorela, Kamelia S. Kalkova.....791

Copper phytoextraction and subsequent removal from aqueous media in subsurface vertical flow wetland by $\text{Vallisneria spiralis}$
 Silviya Ivanova-Popova, Ginyor Hristov, Tanya Boteva, Lyubomir Chibrikov, Kamelia S. Kalkova.....800

Chemical modification of hollow glass of boron
 Miroslav Mladenov, Lyubomir Chibrikov, Kamelia S. Kalkova.....812

Calibration of DC MS method and validation of the modified sample preparation for determination of polyyclic aromatic hydrocarbons
 Ivan Givchev, Dancho Danalev, Spaska Jangova, Dimitar Jancov.....817

First steps of development of a method for simultaneous determination of cholesterol and fatty acids in food matrices
 Hristina El Machouch, Ivan Givchev, Dimitar Jancov, Spaska Jangova, Dancho Danalev.....822

Spectroscopic study of the template synthesized intermetallic Co_2S_4 MnCo_2S_4 nanoparticles with a carbon support
 Yana Stankova, Mehmet Pekin, Ivan Zlatkov, Dimka Ivanova, Lyubomir Chibrikov, Kamelia S. Kalkova.....829