

Contents

Vol. 14, No. 6, 2020

Elementary Physicochemical Processes

UV Photolysis in a $C_2H_2F_2Br_2$ Mixture with Oxygen

*I. K. Larin, T. I. Belyakova, N. A. Messineva,
A. I. Spasskii, and E. M. Trofimova*

893

Structure of Chemical Compounds, Quantum Chemistry, Spectroscopy

The Structure and Properties of Gold Clusters with Substitution and Attachment of Thiol Groups

Yu. A. Dyakov, V. G. Yarzhemsky, and M. G. Golubkov

899

Theoretical Study on the Compounds of Chlorine Fluoride (ClF_3 , $ClOF_3$) and Superhalogens (BeF_2 , MgF_2): Preferred Structures and Significant Nonlinear Optical Properties

Hong Chen Du, Rongkai Pan, Xiqing Dong, and Weiwei Huan

905

Kinetics and Mechanism of Chemical Reactions, Catalysis

Effect of Cysteine on the Antioxidant Activity of Nitroxyl Radicals during the Oxidation of Methyl Linoleate in Micelles

I. V. Tikhonov, L. I. Borodin, and E. M. Pliss

910

Dynamic Adsorption of Ammonium Ions from Aqueous Solutions by Strong-Acid Cationities

*I. V. Kumpanenko, M. V. Dyubanov, N. A. Ivanova,
N. Yu. Kovaleva, E. G. Raevskaya, and A. V. Roshchin*

914

Multiple Addition of 2-Cyano-*Iso*-Propyl Radicals to Fullerene C_{60}

D. R. Diniakhmetova, A. K. Friesen, and S. V. Kolesov

922

Bidirectional Totally Asymmetric Simple Exclusion Process with a Bottleneck and Different Hopping Rates

Song Xiao, Xiaoyu Chen, and Yanna Liu

929

Combustion, Explosion, and Shock Waves

HMX Combustion Mechanism

V. N. Marshakov, V. G. Krupkin, and S. A. Rashkovskii

934

Numerical Simulation of Turbulent Hydrogen Combustion Regimes Near the Lean Limit

A. S. Betev, A. D. Kiverin, S. P. Medvedev, and I. S. Yakovenko

940

Testing of Explosion-Proof Coatings in Cylindrical and Conical Shock Tubes

*S. P. Medvedev, E. K. Anderzhanov, I. V. Guk, A. N. Ivantsov, A. I. Mikhaylin,
M. V. Silnikov, V. S. Pomazov, A. M. Tereza, and S. V. Khomik*

946

Reduction of the Detailed Kinetic Mechanism for Efficient Simulation of Ignition Delay for Mixtures of Methane and Acetylene with Oxygen

A. M. Tereza, G. L. Agafonov, A. S. Betev, and S. P. Medvedev

951

Electrophysical Parameters of Plasma with a Charged Dust Cloud

V. V. Shumova, D. N. Polyakov, and L. M. Vasilyak

959

Expansion of the Stable Surface Combustion Region in an IR Burner Device

V. M. Shmelev

964

Burning Magnesium Powder with Iron Oxide Additives in the Atmosphere of Air*V. G. Krupkin and V. M. Shmelev*

973

Electrical and Magnetic Properties of Materials**Electrical Properties of Powders of Thermally Reduced Graphite Oxide and Epoxy Composites Based on Them***G. V. Simbirtseva, N. P. Piven', and S. D. Babenko*

980

Comparative Study of the Physical Properties of Fine-Crystalline Mechanoactivated and Sol-Gel Samples of $\text{YBa}_2\text{Cu}_3\text{O}_{6.92}$ High-Temperature Superconductors*L. G. Mamsurova, N. G. Trusevich, A. A. Vishnev, K. S. Pigalskiy, and L. I. Trakhtenberg*

986

Physical Methods for Investigation of Chemical Reactions**The Multiplicity and Types of Steady States for a Continuous Stirred-Tank Reactor: a Liquid-Liquid Heterogeneous System***N. G. Samoilenko, E. N. Shatunova, K. G. Shkadinskii, L. V. Kustova, B. L. Korsunskiy, and A. A. Berlin*

990

Peculiarities of the Structure and Phase Formation of the Fe_2TiAl Heusler Alloy during Self-Propagating High-Temperature Synthesis (SHS)*M. L. Busurina, A. E. Sytschev, A. V. Karpov, N. V. Sachkova, and I. D. Kovalev*

999

Investigation of Aniline and *N,N*-Dimethylaniline as Acidic Corrosion Inhibitor: a Structure-Efficiency Relationship Study*Shijun Chen, Zhifang Zhang, Jiao Lin, Simin Qu, Xingang Jia, Shidong Zhu, and Gang Chen*

1007

Chemical Physics of Biological Processes**Sorption Change in Electric Resistance of a Varnished Cambric Insulation by Exposure to the Microscopic Fungus *Aspergillus niger****I. G. Kalinina, V. B. Ivanov, S. A. Semenov, V. V. Kazarin, and O. A. Zhdanova*

1014

Influence of a Medium's pH on *Paramecium caudatum* Cells under Exposure to the Low Temperature Atmospheric Pressure Plasma*I. G. Kalinina, O. V. Karpukhina, V. A. Ryabyi, V. P. Savinov, V. G. Yakunin, A. N. Inozemtsev, and V. B. Ivanov*

1018

Morphology and Antibacterial Properties of Composites Based on Polylactide and Manganese(III) Complex with Tetraphenylporphyrin*Yu. V. Tertyshnaya, A. V. Lobanov, and A. V. Khvatov*

1022

Chemical Physics of Ecological Processes**Study of the Mechanism of Fire-Retardant Action of Bio Flame Retardant Based on Oxidized Compounds of Cellulose-Containing Biomass***S. M. Lomakin, A. V. Khvatov, P. A. Sakharov, E. V. Koverzanova, S. V. Usachev, N. G. Shilkina, and S. D. Varfolomeev*

1028

Sorbents Based on Crown Ethers for Purification of Aqueous Solutions from Metal Ions*V. F. Gromov, G. N. Gerasimov, M. I. Ikim, E. Yu. Spiridonova, and L. I. Trakhtenberg*

1036

Chemical Physics of Polymeric Materials**A New Approach to Analyze the Initiated Thermal Destruction of Polycarbonate***A. V. Kutsenova, V. B. Ivanov, O. E. Rodionova, and A. L. Pomerantsev*

1042

Chemical Physics of Nanomaterials**Enzymatic Stability of Chitosan Interpolyelectrolyte Complex Nanoparticles***S. V. Kolesov, L. A. Badykova, and R. Kh. Mudarisova*

1049

Effect of an Electric Field on a Lithium Ion in a Channel of the Doped Silicene-Graphite System*A. E. Galashev, O. R. Rakhmanova, K. P. Katin, M. M. Maslov, and Yu. P. Zaikov*

1055

Electric Resistance of Binary Oxides $\text{CeO}_2-\text{In}_2\text{O}_3$ Structured at the Nanolevel*K. S. Kurmangaleev, M. A. Kozhushner, and L. I. Trakhtenberg*

1063