

## ISSUE CONTENTS LIST WITH GRAPHICAL ABSTRACTS

### NEWS AND EVENTS

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#### THE 7<sup>TH</sup> INTERNATIONAL CONFERENCE "ECOLOGICAL & ENVIRONMENTAL CHEMISTRY" 2022 March 3-4, 2022, Chisinau, Republic of Moldova

Conference topics:

- A. Fundamental Aspects of Ecological and Environmental Chemistry
- B. Water Science and Society
- C. Climate Change and Atmospheric Chemistry
- D. Food, Soil and Waste Chemistry
- E. Ecological & Environmental Chemistry within the Knowledge Triangle:  
Research-Education-Innovation

Deadline for the *Abstracts submission* is October 15<sup>th</sup>, 2021.



### INVITED PAPER

#### NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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#### THE NATURAL PRODUCT CHEMISTRY OF TERPENOIDS - A TRIBUTE TO THE REMARKABLE LEGACY OF ACADEMICIAN PAVEL VLAD

Aculina Aricu

The purpose of this paper is to put forward concisely some of the most valuable scientific contributions of academician Pavel Vlad and his disciples to the field of natural product chemistry of terpenoids. Under the guidance and with direct contribution of academician Pavel Vlad, new approaches to determining the absolute configuration of a series of labdanic diterpenoids and of converting them into bi-, tri- and tetra- cyclic compounds have been designed. Novel universal methods for synthesizing tetrahydrofurans from 1,4-glycols, olefins from tertiary alcoholic acetates, as well as dienones by means of photodehydrogenation of unsaturated cyclic ketons have been developed by academician Pavel Vlad.

### REVIEW PAPER

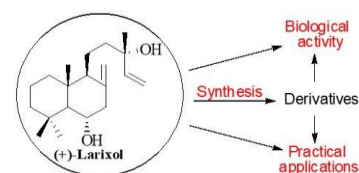
#### NATURAL PRODUCT CHEMISTRY AND SYNTHESIS

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#### (+)-LARIXOL AND LARIXYL ACETATE: SYNTHESSES, PHYTOCHEMICAL STUDIES AND BIOLOGICAL ACTIVITY ASSESSMENTS

Alexandru Ciocarlan

(+)-Larixol is a well-known labdane-type diterpenoid widely used in organic synthesis. The present review covers the (+)-larixol based chemical transformations, the results of phytochemical analysis of new (+)-larixol containing species, as well as recent data on biological activity of (+)-larixol and practical applications where it is mentioned.



### RESEARCH PAPER

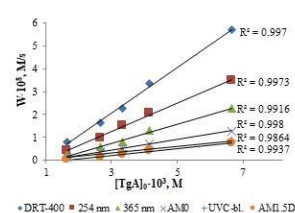
#### ECOLOGICAL CHEMISTRY

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#### SENSITIZED PHOTOLYSIS OF THIOGLYCOLIC ACID IN AQUATIC ENVIRONMENT

Angela Lis, Viorica Gladchi, Gheorghe Duca, Sergey Travin

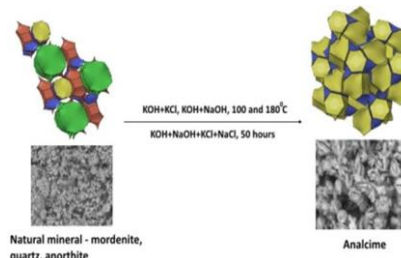
The photochemical transformations of thioglycolic acid using model systems was studied by varying the irradiation sources and the kinetic parameters were determined. It was found that thioglycolic acid undergoes destruction on induced photolysis in the presence of humic substances, and its half-life can be estimated as 10-14 days. Results obtained in the course of this study on model systems were transferred to natural waters, and it was concluded that thioglycolic acid has a positive influence on the chemical self-purification processes of water, in the natural aquatic environment.



**INVESTIGATION OF VARIOUS INFLUENCING FACTORS OF HYDROTHERMAL SYNTHESIS OF ANALCIME ZEOLITE**

Gunel Mamedova and Gunel Nasirli

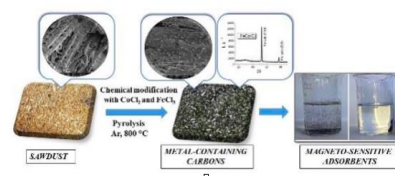
This study presents an investigation of the use of the natural mineral of Nakhchivan Autonomous Republic to produce analcime zeolite of potential practical importance. The influence of temperature and crystallization time, the concentration of alkaline solution and mineralizer on the process of synthesis of analcime has been evaluated. The optimal conditions established for the synthesis of pure analcime with a 100% degree of crystallinity are as follows: temperature of 180°C, alkaline and mineralizer solution of 10-15% KOH and 5-10% KCl and processing time of 50 hours. It has been shown that the presence of the KCl mineralizer promotes the production of pure analcime with a 100% crystallinity, and the natural mineral of Nakhchivan represents a good source for the synthesis process.



**MAGNETO-SENSITIVE CARBON-INORGANIC COMPOSITES BASED ON PARTICLEBOARD AND PLYWOOD WASTES**

Mariia Galaburda, Viktor Bogatyrov, Dariusz Sternik, Olena Oranska, Mykola Borysenko, Ivan Škorvánek, Ewa Skware, Anna Deryło-Marczewska, Volodymyr Gun'ko

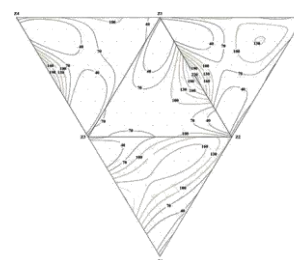
The conversion of metal-modified (Fe, Co) sawdust into magneto-sensitive porous composites using thermal carbonization process in an inert atmosphere was successfully achieved. The as-prepared samples were characterized using nitrogen adsorption, X-ray diffraction, scanning electron microscopy and thermal analysis methods. The obtained results show that the structural and morphological characteristics of the obtained composites depend strongly on the metal precursor's types. All samples exhibited a good magnetic property and can be easily separated from liquids by an external magnet.



**A MODIFIED SCHEFFE'S SIMPLEX LATTICE DESIGN METHOD IN DEVELOPMENT OF CERAMIC CARRIERS FOR CATALYTIC NEUTRALIZERS OF GAS EMISSIONS**

Valery Ved, Hanna Ponomarenko, Yevhenia Ponomarenko, Konstantin Gorbunov

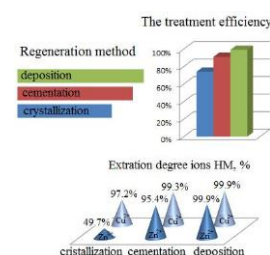
A modified Scheffe's simplex lattice design method is proposed to study the properties of multicomponent materials. This modified Scheffe's method allowed determining the optimal compositions of cordierite and corundum based ceramic materials that are used as catalyst carrier for gas purification equipment. The obtained material (0.63-1.25 mm weight fraction of cordierite of 0.35 mass% fraction; <0.63 mm weight fraction of cordierite of 0.35 mass% fraction; <0.06 mm weight fraction of corundum of 0.2 mass% fraction; 1.25-2.5 mm weight fraction of cordierite of 0.2 mass% fraction) was used successfully for the manufacturing of catalytic neutralizers of gas emissions.



**EVALUATING THE METHODS USED FOR THE REGENERATION PROCESS OF COPPER-ZINC SOLUTIONS**

Vita Datsenko and Vasyly Larin

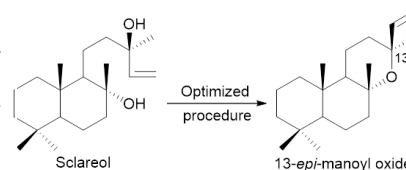
The purpose of this study was to investigate the physicochemical particularities of the regeneration processes that occur in spent sulphate copper-zinc solutions using the reagent methods of crystallization, cementation, and sedimentation. A comparative analysis of the results of the studies of regeneration processes has shown that the content of the extraction of Cu<sup>2+</sup> and Zn<sup>2+</sup> ions by crystallization method makes up to 97.2% and 49.7%, respectively; by the contact displacement method to 99.9% and 95.4%, respectively; and by the deposition method it makes up to 99.9% and 99.9%, respectively. The presented study can be used for improvements in the electroplating productivity.



### ONE - STEP SELECTIVE SYNTHESIS OF 13-EPI-MANOYL OXIDE

Olga Morarescu, Marionela Traistari, Alic Barba, Gheorghe Duca, Nicou Ungur, Veaceslav Kulcički

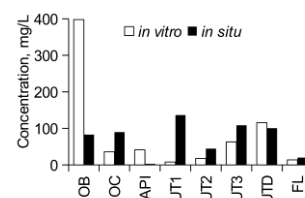
The selective one-step synthesis of 13-*epi*-manoyl oxide is reported based on a low-temperature superacidic cyclization of sclareol. The reaction conditions have been finely tuned in order to achieve a 9:1 ratio between epimeric oxides in favor of the desired 13-*epi*-oxide.



### COMPOSITION AND RADICAL SCAVENGING ACTIVITY OF THE EXTRACTS FROM *DESCHAMPSIA ANTARCTICA* É. DESV. PLANTS GROWN *IN SITU* AND *IN VITRO*

Roman Ivannikov, Iryna Laguta, Viktor Anishchenko, Iryna Skorochod, Pavlo Kuzema, Oksana Stavinskaya, Ivan Parnikoza, Oksana Poronnik, Viktor Kunakh

The work was aimed at studying the phytochemicals available in *D. antarctica* plants from various sites on Antarctic Islands, introducing the plants into *in vitro* culture and comparing the extracts from the plants grown *in situ* and *in vitro*. All the extracts were found to contain high amount of phenols, with luteolin and hydroxybenzoic acids derivatives being the main phytochemicals in the extracts from the plants grown *in situ* and *in vitro*. Being diluted by 10 times, the extracts scavenged 50÷90% of DPPH<sup>•</sup> radicals, 20÷40% of NO<sup>•</sup> radicals and 40÷60% of OH<sup>•</sup> radicals. Despite the differences in composition, extracts from the plants grown *in situ* and *in vitro* showed similar radical scavenging activity.



### PSEUDO JAHN-TELLER ORIGIN OF THE PROTON-TRANSFER ENERGY BARRIER IN THE HYDROGEN-BONDED [FHF]<sup>-</sup> SYSTEM

Natalia Gorinchoy, Iolanta Balan, Victor Polinger, Isaac Bersuker

The results of *ab initio* calculations of the adiabatic potential energy surfaces for the proton-bound [FHF]<sup>-</sup> system at different F-F distances have been rationalized in the framework of the vibronic theory. It is shown that the instability of the symmetric  $D_{\infty h}$  structure at increased F...F distances and the proton displacement to one of the fluorine atoms is due to the pseudo Jahn-Teller mixing of the ground  $1\Sigma_g$  electronic state with the lowest excited state of  $1\Sigma_u$  symmetry through the asymmetric  $\sigma_u$  vibrational mode.

