

UNIVERSITATEA “OVIDIUS” CONSTANȚA



A N A L E L E

UNIVERSITĂȚII “OVIDIUS” CONSTANȚA

ANUL XIV
(2003)

Seria: CHIMIE

VOLUMUL XIV

OVIDIUS UNIVERSITY PRESS

**ANALELE
UNIVERSITĂȚII
“OVIDIUS”
CONSTANȚA**

Seria:

CHIMIE

VOL.XIV

ANUL XIV – 2003

*Special Edition for the National Conference “CHIMIA 2003”,
11-13 September 2006, Constanța, Romania*

ISSN – 1223 – 7221

ANALELE UNIVERSITĂȚII “OVIDIUS “CONSTANȚA Seria CHIMIE “OVIDIUS” UNIVERSITY ANNALS OF CHEMISTRY

AIMS AND SCOPE

Revista “Analele Universității Ovidius” Constanța seria Chimie este o revistă periodică cu referenți ce publică lucrări originale conținând rezultate nepublicate în alte reviste. Lucrările trebuie prezentate în limba engleză.

“Ovidius” University Annals of Chemistry aims to publish original unpublished papers in all branches of fundamental and applied chemistry: inorganic, analytical, biochemistry, organic, physical chemistry, technology and chemical engineering.

EDITORS

Nicolae Rășanu and Dan Mandalopol

“Ovidius” University, Faculty of Physics, Chemistry and Petroleum Technology, 124, Mamaia Blvd., 8700 RO Constanța, Romania.

EDITORIAL ADVISORY BOARD

ANDRUH Marius, University of Bucharest, RO (Inorganic Chemistry);
CARAZEANU Ionela, “Ovidius” University of Constanța, RO (Inorganic Chemistry);
CHIRILĂ Elisabeta, “Ovidius” University of Constanța, RO (Analytical and Environmental Chemistry).
LECA Minodora, University of Bucharest, RO (Physical Chemistry);
MAGEARU Vasile, University of Bucharest, RO (Analytical Chemistry);

MANDALOPOL Dan, “Ovidius” University of Constanța, RO (Petroleum Technology);
MOCANU Raluca “Al I.Cuza” University, Iasi, RO (Analytical and Environmental Chemistry)
PĂTRAȘCU Maximiliana, “Oil & Gas” University, Ploiești, RO (Petroleum Technology);
RĂȘANU Nicolae “Ovidius” University Constanța, RO (Organic Chemistry);
ROȘCA Sorin “Politehnica” University of Bucharest, RO (Organic Chemistry);
TĂRĂBĂȘANU-MIHAILĂ Corneliu “Politehnica” University of Bucharest, RO (Organic Chemistry);

EDITOR IN CHIEF

Elisabeta Chirilă

Mail address: “Ovidius” University, Faculty of Physics, Chemistry and Petroleum Technology, Department of Chemistry, 124, Mamaia Blvd., 8700 RO Constanța, Romania; e-mail: echirila@univ-ovidius.ro

EDITOR ASSISTANT

Ionela Carazeanu

Mail address: “Ovidius” University, Faculty of Physics, Chemistry and Petroleum Technology, Department of Chemistry, 124, Mamaia Blvd., 8700 RO Constanța, Romania; e-mail: icarazeau@univ-ovidius.ro

Executive secretary

Gabriela Stanciu, e-mail: gstanciu@univ-ovidius.ro.

ORDERING INFORMATION

Revista poate fi procurată prin schimb de publicații cu instituții similare din țară și străinătate;
The journal may be obtained on exchange basis with similar Romanian or foreign institutions;
124, Mamaia Blvd, 8700 – RO Constantza, ROMANIA

© 2003 Ovidius University Press. All rights reserved.

Printed in Romania

This journal and the individual contributions contained in it are protected under copyright by Ovidius University Press and the following terms and conditions apply to their use:

Single photocopies of single articles may be made for personal use as allowed by national copyright laws. Permission of the Publisher and payment of a fee is required for all other photocopying, including multiple or systematic copying. Permissions may be sought directly from Ovidius University Press, 124 Mamaia Blvd, 8700 RO Constanța, Romania

NATIONAL CONFERENCE “CHIMIA 2003”

September, 11-13, 2003, Constanta, ROMANIA

SCIENTIFIC COMMITTEE

Prof. Dr. **Marius ANDRUH**, University of Bucharest

Prof. Dr. **Minodora LECA**, University of Bucharest

Prof.dr **Vasile MAGEARU**, University of Bucharest

Prof.dr.eng. **Dan MANDALOPOL**, “Ovidius” University of Constanța

Prof. Dr. **Raluca MOCANU**, “Al.I.Cuza”University of Iasi

Prof.dr. **Nicolae RASANU**, “Ovidius” University of Constanța,

Prof.dr. eng. **Sorin Ioan ROȘCA**, “Politehnica” University of Bucharest

Prof.dr. eng. **Corneliu TĂRABAȘANU MIHAILĂ**, “Politehnica” University of Bucharest

Dr. **Semaghiul BIRGHILĂ**, “Ovidius” University of Constanța

Dr.eng. **Ionela CARAZEANU**, “Ovidius” University of Constanța

Dr. **Elisabeta CHIRILA**, “Ovidius” University of Constanța

Dr. **Viorica POPESCU**, “Ovidius” University of Constanța

Dr. **Gabriela STANCIU**, “Ovidius” University of Constanța

CONTINUATION COMMITTEE

Ionela CARAZEANU, “Ovidius” University of Constanța

Elisabeta CHIRILA, “Ovidius” University of Constanța

Vasile MAGEARU, University of Bucharest

Dan MANDALOPOL, “Ovidius” University of Constanța

Nicolae RĂȘANU, “Ovidius” University of Constanța

Sorin Ioan ROȘCA, “Politehnica” University of Bucharest

ORGANISING COMMITTEE

CONFERENCE CHAIRPERSON:

Prof.Dr. **Nicolae RAȘANU**, “Ovidius” University of Constanta

CO-CHAIRPERSON

Prof.Dr.eng. **Dan MANDALOPOL**, “Ovidius” University of Constanta

SECRETARIAT

Dr. Anca DUMBRAVA, Dr. **Simona DOBRINAS**, **Lucica BARBES**, **Nicoleta MATEI**, “Ovidius”
University of Constanța

MEMBERS

Dr. **Semaghiul BIRGHILA**, Dr. eng. **Ionela CARAZEANU**, Dr. **Elisabeta CHIRILA**, Dr. **Viorica POPESCU**, Dr. eng. **Gabriela STANCIU**, Dr. **Anca DUMBRAVA**, Dr. eng. **Claudia KONCSAG**, Dr. eng. **Irina NITA**, Dr. **Simona DOBRINAS**, **Lucica BARBES**, **Carmen GUGUTA**, **Simona GUTAGA**, **Nicoleta MATEI**, **Alina SOCEANU**, **Anca STERPU**, **Corina TEODORESCU**, **Anca TOIU**, **Anisoara ZAHARIA**, “Ovidius” University of Constanța