CEI
CENTRAL EUROPEAN INITIATIVE

BOOK OF ABSTRACTS

Eleventh International Conference on Radiation, Natural Sciences, Medicine, Engineering, Technology and Ecology

June 19 - 23, 2023 | Hunguest Hotel Sun Resort | Herceg Novi | Montenegro

Dunja Jovanovic, Ana Filipovic, Bojan Bondzic, Aleksandra Bondzic, Influence of the structures of THIQ derivatives on their inhibitory properties toward acetyl- and butyrylcholinesterase.....134

Mirjana Čolović, Goran Gajski, Ana-Marija Domijan, Marko Gerić, Nada Savić, Tatjana Parac-Vogt, Danijela Krstić, *In vitro* genotoxicity assessment of a monolacunary Wells-Dawson nanocluster as a promising contrast agent candidate 135

Vyara Velcheva, Kaspar Hegetschweiler, Angel Ugrinov, Georgi Momekov, Galina Gencheva, Platinum(IV) complexes of the 1,3,5-triamino-1,3,5-trideoxy-cis-inositol- synthesis: structure and antiproliferative properties 136

Slava Tsoneva, Marian Hristov, Andgela Todorova, George Valev, Teodora Vasileva, Stoyanka Nikolova, Petya Marinova, Anthranilic acid amide and its complex with Cu(II) ions 137

MEDICINE – CASE REPORTS

Marijana Maneska, Vladimir Ristovski, Not a myocardial infarction 138

Zorana Đaković, Aleksandra Marjanović, Zorana Babić, Hair loss after covid 19 - case series 139

Irena Stoilova, Penka Kostadinova, Vanya Birdanova, Cases of vibration disease in workers exposed to prolonged vibration 140

Jasmin Ramić, Nikolina Tomić, Naida Lojo-Kadrić, Belmina Šarić Medić, Lejla Pojskić, Huntington's disease case report: intermediate number of repeats expansion in paternal transmission 141

MICROWAVE, LASER, RF, UV AND SOLAR RADIATIONS

Zsuzsanna Vecsei, Zsófia Szilágyi, Bertalan Pintér, György Thuróczy, Personal radiofrequency exposure measurements at a summer music festival 142

Jelena Jovanovic, Vesna Panic, Borivoj Adnadjevic, About the influence of different external fields on the swelling kinetics of PMAA hydrogels 143

Victoria Zaryabova, Tsvetelina Shalamanova, Michel Israel, Mihaela Ivanova, Exposure assessment of electromagnetic field from telecommunications sources in populated areas in correlation with public concern 144

Mihaela Ivanov, Michel Israel, Tsvetelina Shalamanova, Victoria Zaryabova, Problems with the implementation of the European legislation for the protection from laser radiation in the working environment.....145

NEUROSCIENCE

Feng Ru Tang, Early life irradiation-induced hypoplasia and impairment of neurogenesis in the dentate gyrus are mediated by Microrna- 34a-5p/T-cell intracytoplasmic Antigen-1 pathway.....146

Reni Kalfin, Maria Lazarova, Valya Grigorova, Diamara Uzunova, Miroslava Stefanova, Borislav Minchev, Polina Petkova-Kirova, Aleksander Dolashki, Lyudmila Velkova, Lyubka Tancheva, Pavlina Dolashka, Beneficial effects of *Helix aspersa* extract in Parkinson's disease 147

Lyubka Tancheva, Reni Kalfin, Maria Lazarova, Borislav Minchev, Valya Grigorova, Diamara Uzunova, Miroslava Stefanova, Polina Petkova-Kirova, Albena Alexandrova, Elina Tzvetanova, Almira Georgieva, Ventseslav Atanasov, Alexander Dolashki, Lyudmila Velkova, Pavlina Dolashka, How to fight Alzheimer's type dementia: the role of snail extract.....148

NEUTRON AND HEAVY ION RADIATIONS

Emanuele Vincenzo Pagano, Latest results on NArCoS: a new correlator for neutrons and charged particles with high angular and energy resolution 149

Gianluca Santagati, Emanuele Vincenzo Pagano, Some results for the study of the efficiency and cross-talk probability by using GEANT4 simulations for the neutron correlator NArCoS 150

Aleksandra Paveleva, Evgeniy Altynbaev, Dmitry Trunov, Research station for tomographic and radiographic studies of large objects and the possibilities of its application 151

Eleventh International Conference on Radiation,
Natural Sciences, Medicine, Engineering, Technology and Ecology
June 19 - 23, 2023 | Hunguest Hotel Sun Resort | Herceg Novi | Montenegro
BOOK OF ABSTRACTS rad-conference.com

About the influence of different external fields on the swelling kinetics of PMAA hydrogels

Jelena Jovanovic[1], Vesna Panic[2], Borivoj Adnadjevic[3]

1 Institute for General and Physical Chemistry, Studentski Trg 12-16/V, Belgrade, Serbia
2 University of Belgrade, Innovation Center of Faculty of Technology and Metallurgy, 4 Karnegijeva Street, Belgrade, Serbia
3 Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia

https://doi.org/10.21175/rad.abstr.book.2023.25.2

Hydrogels are 3D cross-linked structures that, due to their unique physical and chemical properties and possible applications, are the subject of intensive research in recent decades. In this work, the effects of external physical fields (ultrasonic (US) and microwave (MW)) on the isothermal swelling kinetics of poly(methacrylic acid) hydrogel were examined. A sample of poly(methacrylic acid) (PMAA) xerogel (PMMA-X) was synthesized by the process of cross-linking free radical polymerization, which is described in detail in the paper [1]. The basic primary structural properties of PMMA-X including the equilibrium swelling degree in distilled water (SDeq), the density of xerogel (ρxg), the average molar mass between the crosslinks of a network (Mc), the degree of crosslinking (ρc) and the distance between the macromolecular chains (ξ), were determined and calculated. The isothermal kinetic swelling curves were determined by the tee-bag method at a temperature range of T= 293-323K in the presence of thermal, ultrasonic, and microwave fields. The isothermal kinetic curves of swelling were fitted with the Peppas' kinetic model [2]. The values of the isothermal kinetic parameters of the Peppas model (k, n) were calculated. Based on the temperature dependence of the parameter using the Arrhenius equation, all values of the activation energy (Ea) and the pre-exponential factor (lnA) of the swelling process in the presence of different physical fields were calculated. The obtained results indicate that the presence of US and MW fields leads to an increase in the values of k, n, Ea, and compared to the corresponding values during conventional heating. The US field relatively slightly increases the value of SDeq, while the MW field significantly reduces the value of SDeq. The values of Ea and lnA at different physical fields are interrelated by a correlation relationship (compensation effect) which is given by the relation: lnAf=0.326+0.406Ea, f The existence of a compensation effect [3] is an indication of the unique mechanism of activation of the polymer network at different physical fields for swelling and of the quantum nature of Ea. The influence of US and MW fields on the diffusion of water molecules through the polymer network, activation of the polymer network for swelling, and relaxation of the polymer network was analyzed.

References:

1 V V. Panic, J. D. Jovanovic, I. G. Popovic, S. I. Savic, M. D. Markovic, P. M. Spasojevic, B. Adnadjevic, The study of composition-properties relationships for composite hydrogels based on poly(methacrylic acid) and high concentrations of MFI zeolite, Polymer 269, 125750 (2023).

2 J Jovanovic, B Adnadjevic, A Kostic, The effects of the pH value of the swelling medium on the kinetics of the swelling of a poly (acrylic acid) hydrogel, Journal of applied polymer science 116 (2), 1036-1043 (2010).

3 B. Adnađević, J. Jovanović: The effect of microwave heating on the isothermal kinetics of chemicals reaction and physicochemical processes. Chapter in: Advances in Induction and Microwave Heating of Mineral and Organic Materials, Eds. Stanisław Grundas, INTECHWEB.ORG, pp. 391- 422 (2011).

TITLE: Book of Abstracts
EDITOR: Prof. Dr. Goran S. Ristić
TECHNICAL EDITING: Aleksandar Ristić, MD
COVER DESIGN: Vladan Nikolić, PhD
YEAR OF PUBLISHING: 2023
PUBLISHER: RAD Centre, Niš, Serbia
FOR THE PUBLISHER: Prof. Dr. Goran S. Ristić
CD BURNING AND COPYING: RAD Centre, Niš, Serbia
PRINT RUN: Electronic edition - 50 CDs (CD-R)
ISBN: 978-86-901150-6-8
www.rad-conference.org

CIP - Каталогизација у публикацији Народна библиотека Србије, Београд

539.16(048)(0.034.2)
57+61(048)(0.034.2)

INTERNATIONAL Conference on Radiation, Natural Sciences, Medicine, Engineering, Technology and Ecology (11 ; 2023 ; Herceg Novi)

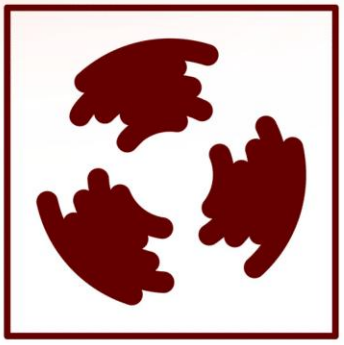
Book of abstracts [Elektronski izvor] / Eleventh International Conference on Radiation, Natural Sciences, Medicine, Engineering, Technology and Ecology (RAD 2023) 19–23.06.2023, Herceg Novi ; [editor Goran S. Ristić]. – Electronic ed. - Niš : RAD Centre, 2023 (Niš : RAD Centre). - 1 elektronski optički disk (CD-ROM) ; 12 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. - Tiraž 50.

ISBN 978-86-901150-6-8

a) Јонизујуће зрачење -- Дозиметрија -- Апстракти b) Биомедицина -- Апстракти

COBISS.SR-ID 121386249



ISBN-978-86-901150-6-8