

WE ARE *live* IN

*Veli Lošinj*



**27<sup>th</sup> CROATIAN MEETING  
OF CHEMISTS AND CHEMICAL ENGINEERS**

WITH INTERNATIONAL PARTICIPATION • 5<sup>th</sup> SYMPOSIUM "VLADIMIR PRELOG"  
5-8 OCTOBER 2021 • VELI LOŠINJ, HOTEL PUNTA, CROATIA

**BOOK OF ABSTRACTS**



27<sup>th</sup> CROATIAN MEETING OF CHEMISTS AND CHEMICAL ENGINEERS  
27. HRVATSKI SKUP KEMIČARA I KEMIJSKIH INŽENJERA  
5–8 October 2021, Veli Lošinj, Croatia

---

**27<sup>th</sup> Croatian Meeting of Chemists and Chemical Engineers**

with international participation

**5<sup>th</sup> Symposium Vladimir Prelog**

5 – 8 October 2021

Veli Lošinj, Vitality Hotel Punta, Croatia

**BOOK OF ABSTRACTS**

## SCIENTIFIC AND ORGANISING COMMITTEE

**Dean Marković**, *Chair*, University of Rijeka

**Ernest Meštrović**, *Co-chair*, Xellia d.o.o.

**Vesna Tomašić**, *Co-chair*, Faculty of Chemical Engineering and Technology, University of Zagreb

**Senka Djaković**, *secretary*, Faculty of Food Technology and Biotechnology, University of Zagreb

**Nikola Bregović**, Faculty of Science, University of Zagreb

**Zrinka Buhin Šturlić**, Medic d.o.o.

**Igor Dejanović**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Stjepan Džalto**, Hidroplan d.o.o.

**Zvezdana Findrik Blažević**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Vesna Gabelica Marković**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Nenad Judaš**, Faculty of Science, University of Zagreb

**Olgica Martinis**, Education and Teacher Training Agency

**Danijel Namjesnik**, Faculty of Science, University of Zagreb

**Jasna Prlić Kardum**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Silvana Raić Malić**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Marko Rogošić**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Marin Roje**, Ruđer Bošković Institute, Zagreb

**Aleksandra Sander**, Faculty of Chemical Engineering and Technology, University of Zagreb

**Vladislav Tomišić**, Faculty of Science, University of Zagreb

**Andrea Usenik**, Faculty of Science, University of Zagreb

**Mario Vazdar**, Ruđer Bošković Institute, Zagreb

## INTERNATIONAL SCIENTIFIC COMMITTEE

**Jurica Bauer**, Maastricht University, Maastricht, the Netherlands

**David Bogle**, University College London, London, UK

**Paweł Dydio**, Laboratory of Complex Systems in Synthesis & Catalysis (CosyCAT), Institute of Science and Supramolecular Engineering (ISIS), University of Strasbourg & CNRS, Strasbourg Cedex, France

**Tomislav Friščić**, McGill University, Montreal, Canada

**Janez Plavec**, Slovenian NMR Centre, National Institute of Chemistry, Ljubljana, Slovenia

**Giovanna Speranza**, Department of Chemistry, University of Milan, Milan, Italy

## LOCAL ORGANISING COMMITTEE

**Gabriela Ambrožić, Maria Kolympadi Markovic, Sandra Kraljević Pavelić, Tomislav Pavlešić, Alma Ramić**

# IMPRESSUM

## ORGANIZERS

Croatian Chemical Society  
Croatian Society of Chemical Engineers

## PUBLISHED BY

Croatian Chemical Society

## EDITORS

Dean Marković, Ernest Meštrović,  
Danijel Namjesnik, Vesna Tomašić

## DESIGN & LAYOUT

Danijel Namjesnik & Andrea Usenik

**ISSN:** 2757-0754 (Online)

## VENUE

Veli Lošinj, Vitality Hotel Punta, Croatia  
<https://www.losinj-hotels.com/hr/hoteli-i-vile/hotel-punta/>

**Zagreb, 2021**

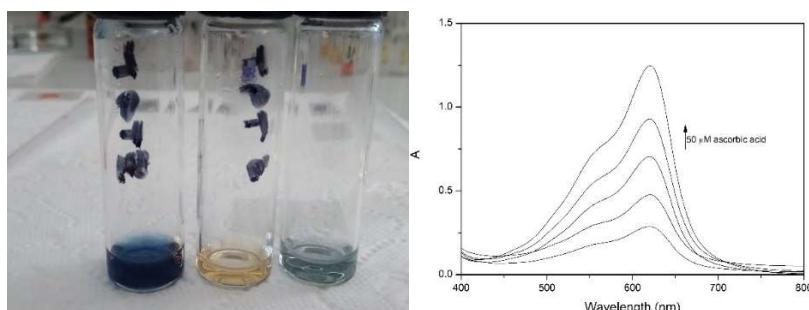
# PREPARATION AND CHARACTERIZATION OF CHITOSAN HYDROGEL-BASED OPTICAL SENSOR FOR TOTAL ANTIOXIDANT CAPACITY DETERMINATION

Pavo Živković, Robert Petrić, Aleksandar Sečenji\*

Department of Chemistry, J. J. Strossmayer University of Osijek, Cara Hadrijana 8A,  
31000 Osijek, Croatia

\* [szealex@kemija.unios.hr](mailto:szealex@kemija.unios.hr)

Total antioxidant capacity (TAC) measures the total antioxidants present in the sample, including their synergic and redox interaction between different molecules present in the sample.<sup>[1]</sup> From the introduction of TAC as a concept until today, many different analytical methods have been developed and applied in different systems for its evaluation. However, the complexity of TAC as a concept and analyte results in inconsistent results, and because of that, there is no universal and straightforward method for TAC evaluation.<sup>[2]</sup> Here we report the preparation of hydrogel-based sensor for TAC evaluation based on change of optical properties in interaction with antioxidants. Hydrogel sensor is prepared by crosslinking of chitosan with 2,2'-bipyridine-4,4'-dicarboxylic acid. Addition of Fe(II) salts and 2,4,6-Tri(2-pyridyl)-1,3,5-triazine (TPTZ) as additional ligand results a blue-colored hydrogel-(2,2'-bipyridine-Fe(II)-TPTZ) complex that loses color if oxidized. The color restores reversibly in the reaction with antioxidants. The hydrogel-based sensor is characterized by UV-VIS spectroscopy regarding its optical and sensory properties.



**Figure 1.** Left: Suspension of hydrogel-(2,2'-bipyridine-Fe(II)-TPTZ) complex (first vial), oxidized suspension (second vial) and partially reduced with ascorbic acid (third vial); Right: UV-VIS spectra of hydrogel after sequential addition of ascorbic acid

## REFERENCES

- [1] N. Pellegrini, P. Vitaglione, D. Granato, V. Fogliano, *J. Sci. Food Agric.*, **2018**, *100*, 5064-5078.
- [2] N. Etsuo, *Free Radic. Biol. Med.*, **2010**, *49*, 503-515.