

DRUŠTVENE VESTI IN DRUGE AKTIVNOSTI

SOCIETY NEWS, ANNOUNCEMENTS, ACTIVITIES

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Trideset let delovanja Šole eksperimentalne kemije na Institutu »Jožef Stefan«: trideset let motiviranja mladih generacij in utrjevanja poti naravoslovnega izobraževanja

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Abstract

Pred 30. leti, natančneje spomladi leta 1992, je bila, v okviru Odseka za anorgansko kemijo in tehnologijo Instituta »Jožef Stefan«, ustanovljena Šola eksperimentalne kemije. Zaradi razvoja znanosti in interdisciplinarnih pristopov, je njen glavni namen približevanje kemije mladim generacijam in prikazovanje njene širše uporabe v vsakdanjem življenju. Šola eksperimentalne kemije tako ustvarja pomemben most med raziskovanjem in izobraževanjem ter aktivno prispeva k popularizaciji predmetnega področja v šolah.

Gljučne besede: Šola eksperimentalne kemije; izobraževanje; raziskovanje; povezovanje; popularizacija; kemija

Kemija se v modernem času ukvarja z odgovori na pomembna vprašanja, kot so na primer kemijske osnove mišljenja, razvoj procesov življenja, okoljska problematika, sinteza različnih materialov in na vse zadnje tudi z odkrivanjem novih (alternativnih) virov energije¹. Omenjena področja zajemajo izrazit interdisciplinarni pristop, zato je potreba po povezovanju ključna. Kemija prav tako predstavlja gonilno silo različnih panog industrije, kjer se morajo strokovnjaki prav tako spoprijemati z najrazličnejšimi praktičnimi izzivi. Če pomislimo, je kemija postala del našega življenja¹. Zaradi omenjenih razlogov in razvoja interdisciplinarnih pristopov v znanosti, je vselej nujno mlajše generacije opremiti z znanjem in veščinami, ki jih bodo lahko tekom študija in razvoja profesionalne poti tudi oplemenitili. Še kako pomembno je navduševati mlade generacije učencev in dijakov za povezovanje v naravoslovju skozi različne dogodke in vsebine, in nenazadnje tudi za komunikacijo znanstvenih vsebin s splošno javnostjo.

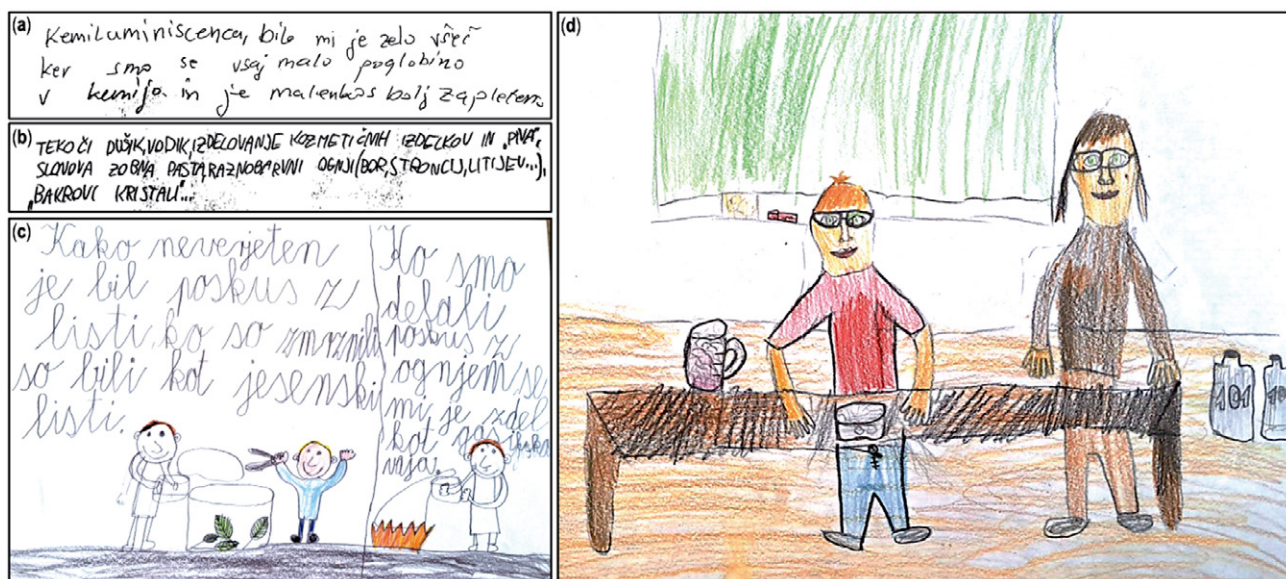
Ker je kemija nekoč veljala za splošno pust in težak predmet, kar je posledično vplivalo tudi na njeno priljubljenost, je bila pred 30. leti, natančneje spomladi leta 1992, v okviru Odseka za anorgansko kemijo in tehnologijo Instituta »Jožef Stefan«, ustanovljena Šola eksperimentalne kemije^{2,3,4}. Njen začetnik, prof. dr. Andrej Šmalc, je že ob njeni 15. obletnici poudaril, da so kemijski eksperimenti tisto, s čimer je mogoče pouk kemije bistveno pope-

striti, ga narediti zanimivega in privlačnega². V izvedbenem pogledu so prav kemijski poskusi, v primerjavi s fizikalnimi, bolj zahtevni in potrebujejo posebej za to urejene prostore. Po večini se v šolskih kemijskih učilnicah izvajajo zgolj demonstracijski tipi poskusov, med tem ko so možnosti za individualno eksperimentalno delo učencev dokaj omejene².

Šola eksperimentalne kemije je namenjena učencem in dijakom, ki želijo znanja kemije poglobiti še na eksperimentalni ravni, predvsem takim, ki jih veseli samostojno eksperimentiranje.

Poskusi, ki so zanimivi, zabavni in postavljeni v kontekstualni okvir vsakdanjega življenja, se hkrati skladajo z vsebinami temeljnega kurikulumu in udeležence spodbujajo k poglobljenemu razmišljanju². Pri eksperimentiranju udeleženci na primer spoznajo naravne pojave in jih na preprost način razložijo s kemijskimi poskusi (primer nastanek in oddajanje svetlobe)^{5,6}, pojasnjujejo vlogo in uporabo naravnih barvil⁷, povezujejo kemijo z drugimi tehničnimi disciplinami, kot sta elektrotehnika in razvoj senzorjev⁸, in podobno (Slika 1).

Med delom v laboratoriju si udeleženci pridobijo osnovne eksperimentalne veščine in spoznajo ukrepe za varno delo. Skozi delo v skupinah se učijo medsebojnega sodelovanja ter skozi predstavitve in demonstracije poskusov urijo svoje govorniške spretnosti.

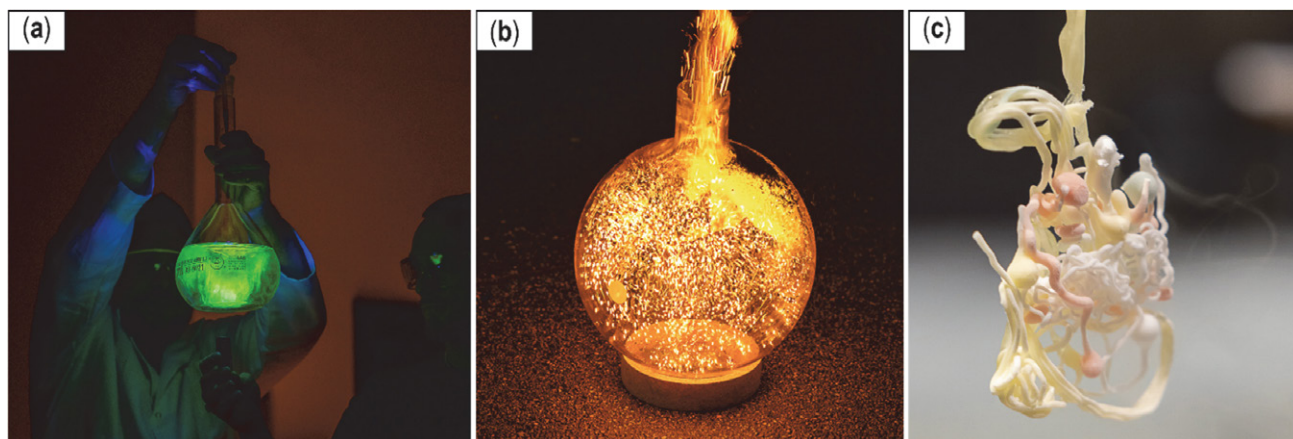


Slika 1: Odzivi udeležencev poletne Šole eksperimentalne kemije (a, b) in primera umetniških vtisov po obisku delavnice Šole eksperimentalne kemije na eni izmed šol (c, d) (Vir: osebni arhiv M. Tramšek).

Obiski učencev in dijakov se lahko povežejo tudi z ogledom laboratorijev Odseka za anorgansko kemijo in tehnologijo. Posamezniki se tako seznani z dejansko uporabo nekaterih metod pri raziskovalnem delu, katerih osnove so spoznali pri poskusih. V tem primeru lahko v živo vidijo in vsaj na kratko občutijo utrip raziskovalnega okolja.

Šola eksperimentalne kemije je bila sprva zasnovana v obliki enotedenskih tečajev v skupnem trajanju 32 šolskih ur, ki potekajo v t.i. šolskem laboratoriju institutskega odseka. Tečaj vodi mentor, ki udeležencem pripravi ustrezen program, gradivo in udeležence seznani z varnostno kulturo ter z ravnanjem z odpadki po izvedenem poskusu². Skozi leta je Šola eksperimentalne kemije postala pomemben akter promocije znanosti na različnih dogodkih. Predvsem je bila dobro sprejeta na vsakoletnih dogodkih Festivala znanosti, ki poteka pod okriljem Slo-

venske znanstvene fundacije (SZF)⁹. Člani ekipe vsako leto aktivno promoviramo znanost z različnimi demonstracijskimi nastopi po osnovnih in srednjih šolah ter vrtcih. Od leta 2018, izvajalci delavnice Šola eksperimentalne kemije v okviru Evropske noči raziskovalcev, aktivno sodelujemo pri projektu »Noč ima svojo moč«, kjer skupaj s partnerji (poleg Instituta »Jožef Stefan« še: Ustanova Hiša eksperimentov, Kemijski inštitut, Tehniški muzej Slovenije, Geološki zavod Slovenije ter Botanični vrt Univerze v Ljubljani) poudarjamo pomen znanosti za širšo družbo¹⁰. Evropski dogodek noči raziskovalcev med drugim, preko različnih predavanj in delavnic, omogoča neposredno komunikacijo raziskovalcev s posamezniki. Na ta dan sodelavci Instituta »Jožef Stefan« sodelujemo pri večeru odprtih vrat z najrazličnejšimi delavnicami, in dogajanje popestrimo s »showi« eksperimentov (Slika 2).



Slika 2: »Show« eksperimentov, ki je potekal v okviru dogodka »Noč ima svojo moč 2022«, na Institutu »Jožefa Stefana« (Foto: M. Verč, Institut »Jožef Stefan«). (a) Difuzija in fluorescenca barvila fluorescein v vodnem stolpcu (angl. vortex); (b) s kromovim(III) oksidom katalizirana oksidacija amonijaka, pri kateri nastanejo iskre oz. t.i. »kresničke«; (c) vključevanje naravnih barvil v natrijev alginat in preučevanje lastnosti gela v tekočem dušiku. (Foto: M. Verč, Institut »Jožef Stefan«)

Glavni namen Šole eksperimentalne kemije temelji na približevanju kemije mladim generacijam in prikazovanju njene širše uporabe v vsakdanjem življenju ter s tem prispevati k njeni popularizaciji. Ob enem pa naj bi šola tistim učencem, ki čutijo večje nagnjenje do naravoslovja, ustvarila željo po študiju kemije in morda tudi po raziskovalnem delu na tem področju.

»Življenje je potovanje, ne cilj.«

Ralph Waldo Emerson

Izvajalci programa Šole eksperimentalne kemije smo počaščeni, da smo lahko del programa s trideset letno tradicijo. Nadvse nas navdušuje, da lahko svoje poslanstvo širimo med mlade in jih tako motiviramo za raziskovanje naravoslovnih znanosti.

Zahvala

Avtorji prispevka se iskreno zahvaljujemo začetnikom Šole eksperimentalne kemije: prof. dr. Andreju Šmalcu, prof. dr. Borisu Žemvi in mag. Tomažu Ogrinu, ter njihovim sodelavcem in prostovoljcem, ki so s svojim entuziazmom in predanostjo pripomogli k častitljivi obletnici. Prav tako hvala tudi doc. dr. Gašperju Tavčarju, vodji Odseka za anorgansko kemijo in tehnologijo Instituta »Jožef Stefan«, za podporo in motivacijo pri nadaljnjih korakih. Velika zahvala gre tudi Javni agenciji za raziskovalno dejavnost Republike Slovenije (ARRS) in raziskovalnemu

programu P1-0045 za podporo pri ohranjanju povezav instituta s celotno izobraževalno vertikalo.

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V letu 2021 je Slovensko kemijsko društvo praznovalo 70 –letnico ustanovitve. Zaradi epidemiološke situacije smo bili primorani Slavnostno akademijo preložiti na letošnje leto- potekala je 22. 9. 2022 v Grand Hotelu Bernardin v Portorožu. Dogodka se je udeležilo več kot 310 povabljenih gostov iz 13 držav, med drugim tudi predsednika hrvaškega in slovaškega kemijskega društva ter predstavniki ECTN in EuChemS.

Slavnostni govorniki so bili prof. dr. Tamara Lah Turnšek, akad. prof. dr. Branko Stanovnik in prof. dr. Venčeslav Kaučič, katerih govore si lahko preberete v nadaljevanju.

Slovensko kemijsko društvo je podelilo priznanja 8 častnim članom, 9 zaslužnim članom, 11 zaslužnim inštitucijam; priznanja za sodelovanje pri uredništvu znanstvene revije Acta Chimica Slovenica pa je prejelo 30 sodelavcev. Vsem se želim še enkrat zahvaliti za odlično delo v Slovenskem kemijskem društvu.

Na koncu gre zahvala tudi sponzorjem Slavnostne akademije, ki so omogočili proslavo ob tako pomembni obletnici- hvala torej podjetjem Cinkarna Celje, Salonit Anhovo, Knauf Insulation, Melamin, Aquafil, Novartis, Belinka Perkemija, Krka, Kemomed, Mettler Toledo in Primalab za podporo in sodelovanje.

Dr. Peter Venturini,
predsednik Slovenskega kemijskega društva

Dr. Peter Venturini, predsednik SKD:

Spoštovani visoki gostje, dragi prijatelji!

Biti kemik je velik privilegij in hkrati odgovornost. Je poslanstvo, ki ga z veseljem izpolnjujemo. Pri raziskovalnem delu odkrivamo nova znanja, ki so osnova za razvoj novih izdelkov in tehnologij, ki vodijo v napredek industrije in družbe kot celote ter smo pri tem zavezani varovanju okolja in zdravja ljudi. Prav nova spoznanja kemikov, kemijskih tehnologov in kemijskih inženirjev so bistveno prispevala k vse boljši kvaliteti življenja v Sloveniji in po svetu.

Prvi namen ustanovitve Slovenskega kemijskega društva je pospeševanje napredka kemije v najširšem pomenu besede. Zavedanje, da je za razvoj stroke ključnega pomena dobro sodelovanje med strokovnjaki v Sloveniji in tesna vpetost v mednarodno okolje, vodi delo članov društva in vse naše aktivnosti. Člani društva aktivno sodelujemo pri mnogih mednarodnih znanstvenih in strokovnih pobudah- na primer pri organizaciji konferenc, kot uredniki pri mednarodnih publikacijah in smo aktivni člani mnogih sorodnih mednarodnih združenj.

Ob mnogih aktivnostih našega društva tokrat izpostavljam dve:

- Vsakoletno srečanje poimenovano Slovenski kemijski dnevi in
- Izdajanje revije Acta Chimica Slovenica.

Dr. Peter Venturini, SCS President:

Distinguished guests, dear friends!

Being a chemist is both a privilege and a responsibility. It is a mission that we are happy to fulfil. Our research work uncovers new knowledge that forms the basis for the development of new products and technologies that lead to progress in industry and society as a whole, with a commitment to protecting the environment and human health. It is the new discoveries of chemists, chemical technologists and chemical engineers that have contributed significantly to the increasing quality of life in Slovenia and around the world.

The initial purpose of the founding of the Slovenian Chemical Society was to promote the progress of chemistry in the broadest sense of the word. The understanding that good cooperation between experts in Slovenia and close involvement in the international environment are crucial for the development of the profession guides the work of the members of the Society and all our activities. Members of the Society actively participate in many international scientific and professional initiatives – for example, in the organisation of conferences, as editors of international publications and as active members of many related international associations.

Among the many activities of our Society, I would like to highlight two:

Velika zahvala gre vsem članom in prijateljem Slovenskega kemijskega društva, ki ste pripomogli k odlični kakovosti in mednarodni prepoznavnosti obeh. V zadnjih letih je Kemijske dneve zelo uspešno razvijal organizacijski odbor pod vodstvom profesorja Albina Pintarja s Kemijskega inštituta. Zelo smo ponosni tudi na visoko odmevnost naše revije *Acta Chimica Slovenica*. Revija sledi sodobnim trendom odprte znanosti pri objavi znanstvenih člankov s prostim dostopom do vseh objav. Uredniški odbor revije že vrsto let uspešno vodi glavna urednica profesorica Ksenija Kogej s Fakultete za kemijo in kemijsko tehnologijo, Univerze v Ljubljani. Lepa hvala spoštovana Ksenija in Albin za izjemno opravljeno delo.

Že daljši čas je pomembna usmeritev pri našem delu trajnostni razvoj in ponosen sem, da bomo v okviru tokratnih Slovenskih kemijskih dnevov prvič podelili tudi nagrade študentom za najboljša dela s tega področja.

Pomembno delo za navduševanje mladih za kemijo ter njihovo ozaveščanje za okoljsko odgovorno obnašanje opravijo naši kolegi učitelji v osnovnih, srednji šolah in na univerzah za kar jim gre vse priznanje.

V Sloveniji smo lahko ponosni na izredno visok interes in nivo znanja na različnih področjih kemije na vseh stopnjah šolanja. Odličen je tudi nivo znanosti v visokošolskih ustanovah in na raziskovalnih inštitutih. Mnogi slovenski strokovnjaki sodijo med vodilne v svetu, kar je temelj za to, da so tudi mnoga slovenka podjetja zelo uspešna v mednarodnem okolju.

V Slovenskem kemijskem društvu se bomo tudi v prihodnje trudili za pospeševanje napredka kemije, kemijske tehnologije in kemijskega inženirstva s ciljem pridobivanja ključnih znanj za naslednje korake pri trajnostnem razvoju in dvigu kvalitete življenja v Sloveniji in širše.

Na koncu se želim zahvaliti vsem članom društva, predstavnikom podjetij, raziskovalnih in izobraževalnih ustanov ter javne uprave za odlično sodelovanje in partnerstvo ter tudi finančno podporo, ki nam omogoča izvedbo vseh naših aktivnosti.

Iskrene čestitke in velika zahvala gre vsem današnjim nagrajencem, ki ste pomembno prispevali k razvoju Slovenskega kemijskega društva.

Vsem želim prijetno in zanimivo druženje, ter veliko novih poznanstev in izmenjav znanj v okviru konference Slovenski kemijski dnevi.

- the annual meeting known as Slovenian Chemical Days and
- the publication of *Acta Chimica Slovenica*.

A very special thank you to all the members and friends of the Slovenian Chemical Society who have contributed to the excellent quality and international visibility of both. In recent years, the Chemical Days have been developed very successfully by the organising committee led by Professor Albin Pintar from the National Institute of Chemistry. We are also very proud of the high visibility of our journal *Acta Chimica Slovenica*. The journal follows the current trends of open science in publishing scientific articles with open access to all publications. The Editorial Board of the journal has been successfully led for a number of years by the Editor-in-Chief, Professor Ksenija Kogej from the Faculty of Chemistry and Chemical Technology, University of Ljubljana. Thank you very much, Ksenija and Albin, for your outstanding work.

Sustainable development has been an important focus of our work for quite some time and I am proud that for the first time at this year's Slovenian Chemical Days, we will also be awarding prizes for the best work in this field to students.

The work our fellow teachers in primary and secondary schools and at universities are doing is essential for getting young people excited about chemistry and to raise their awareness of environmentally responsible behaviour, for which they are to be commended.

Slovenia can be proud of the extremely high level of interest and knowledge in various areas of chemistry at all levels of education. The level of science in higher education institutions and research institutes is also excellent. Many Slovenian experts are among the leading in the world, which is why a number of Slovenian companies are also highly successful in the international environment.

The Slovenian Chemical Society will continue its efforts to promote the advancement of chemistry, chemical technology and chemical engineering in order to accumulate key competencies for the next steps in sustainable development and improving the quality of life in Slovenia and beyond.

Finally, I would like to thank all the members of the Society, representatives of companies, research and educational institutions and public administration for their excellent cooperation and partnership, as well as the financial support that makes all our activities possible.

Heartfelt congratulations and a big thank you to all of today's award winners who have made a significant contribution to the development of the Slovenian Chemical Society!

I wish you an enjoyable and eventful time and I hope that you form many new acquaintances and knowledge exchanges during the Slovenian Chemical Days.

Prof. dr. Tamara Lah Turnšek, Predsednica znanstveno- raziskovalnega razreda IAS:

»Spoštovanim tovarišem kemikom spročamo, da je bil dne 15. februarja 1951 ustanovni občni zbor »Slovenskega kemijskega društva« ki bo združevalo vse kemike v LR Sloveniji. S tem se je spremenila dosedanja organizacijska oblika kemične sekcije Društva inženirjev in tehnikov LRS in razširila v samostojno strokovno in znanstveno društvo«.

Tako je bil oznanjen zgodovinski dogodek ustanovitve Slovenskega Kemijskega Društva - SKD pred dobrim stoletjem.

Seveda segajo začetki kemije na slovenskem kar precej dlje! V različnih oblikah se je kemija poučevala na srednjih, višjih in visokih šolah in predhodnih formalnih oblik današnje Fakulte za kemijo in kemijski tehnologijo Univerze v Ljubljani

Iz tega (zgodovinskega) prepleta znanj je izšel tudi prvi slovenski Nobelov nagrajenec, dr. Friderik Fritz Pregl, rojen v Ljubljani in leta 1894 promoviran za doktorja vsega zdravilstva (medicum universum) na univerzi v Gradcu. Njegovo delo bi danes sodilo na področje biokemije, saj so njegova temeljna spoznanja v organski kemiji obravnavala predvsem aminokisline, ogljikove hidrate in purine, kar bi sodilo danes na področje biokemije! Nobelovo nagrado je prejel 1923 za razvoj, na milijoninko grama natančne, tehtnice za kvantitativno organsko mikroanalizo v sodelovanju s podjetjem Kuhlmane in je omogočil hiter napredek organske kemije v 20. stoletju. V svoji raziskovalni vni se že kot priznani znanstvenik udinjal kot vajenec pri nekem mizarju, pri ključavničarju in steklopihaču. Tako je sam zaradi svoje »dodatne izobrazbe« izdelal zamišljene aparature od prvega grobega osnutka do zadnje fine obdelave. S tem pa je postavil tudi enega pomembnih temeljnih kamnov slovenskega inženirstva!

To dejstvo se dotika drugega pomembnega dogodka leta 1995, ko je na podlagi več kot stoletja inženirskega dela Skupina slovenskih znanstvenikov s področja tehniških in naravoslovnih znanosti ter uglednih inženirjev, članov društva SATENA, ustanovilo Inženirsko akademijo Slovenije (IAS) z namenom, da se ustvari platforma za politiko in formiranje razvojnih perspektiv proizvodnih industrij, znanstvenih in tehnoloških raziskav ter kvalitetnega inženirskega in poslovnega študija v Sloveniji, v letu 2006 je bila IAS tudi zakonsko ustanovljena na državni ravni.

Trdimo lahko, da prav edina »slovenska« Nobelova nagrada kaže na tesno povezanost med poslanstvom Slovenskega kemijskega društva in IAS. Na to smo lahko prav na današnji slavnosti ponosni!

Ob tem se zavedam globokih korenin znanj, inovativnega

Prof. Dr. Tamara Lah Turnšek, President of the Scientific-Research Group of the IAS:

“Esteemed fellow chemists, we would like to inform you that the founding general assembly of the ‘Slovenian Chemical Society’, which will unite all the chemists in the People’s Republic of Slovenia, was held on 15 February 1951. The current organisational form of the Chemical Section of the Society of Engineers and Technicians of the PRS has thus been changed and expanded to form an independent professional and scientific society”.

This was how the historic event of the founding of the Slovenian Chemical Society (SCS) was announced nearly a century ago.

Of course, the beginnings of chemistry in Slovenia go back much further! Chemistry was taught in various forms at secondary and higher education institutions, and at the previous organisational forms of today’s Faculty of Chemistry and Chemical Technology of the University of Ljubljana.

This (historical) intertwining of knowledge produced the first Slovenian Nobel Prize winner, Dr. Friderik Fritz Pregl, born in Ljubljana and promoted to Doctor of Medicine (medicum universum) at the University of Graz in 1894. His work would today be a part of biochemistry, as his fundamental findings in organic chemistry mainly dealt with amino acids, carbohydrates and purines! He won the 1923 Nobel Prize for developing a balance, precise to the millionth of a gram, for quantitative organic microanalysis in collaboration with the company Kuhlmann, and thereby enabled the rapid progress of organic chemistry in the 20th century. In his eagerness for research, he served, when he was already a renowned scientist, as an apprentice to a carpenter, a locksmith and a glass-blower. Thanks to his “additional education”, he could make the envisaged apparatus for himself from the first rough draft to the last finishing touches. In doing so, he also laid one of the most important cornerstones of Slovenian engineering!

This fact touches upon another significant event in 1995, when, on the basis of more than a century of engineering work, a group of Slovenian scientists, working in technical and natural sciences, and prominent engineers, members of the SATENA association, founded the Slovenian Academy of Engineering (IAS) with the aim of creating a platform for policies and shaping the development perspectives of the manufacturing industries, scientific and technological research, and quality engineering and business studies in Slovenia; in 2006, the IAS was also established by law at the national level.

It could be argued that the only “Slovenian” Nobel Prize

duha in stremljenj vseh mojih predhodnikov v slovenski zgodovni slovenske kemijske znanosti in inženirstva, ki so danes pripeljali obe vеди do uspehov, ki jih naši raziskovalci dosegajo doma in v svetu! S ponosom sem in smo danes lahko hvaležni, da smo imeli priložnost vskravati vse te dobrine tekom svojega učenja in delovanja. Danes imam torej čast, da kot članica, in obenem inženirka organske oz biokemijske smeri, v imenu predsednika in vseh članov IAS čestitam SKD o jubileju društva.

Obenem bi želela poudariti, da imata obe instituciji zelo podobna strmljenja in poslanstva:

da pospešujeta napredek kemije, kemijske tehnologije in kemijskega inženirstva v najširšem pomenu; da skrbita za rast strokovnega znanja svojega članstva in da sodelujeta z vsemi organizacijami, ki se ukvarjajo s kemijsko, tudi biokemijski stroko in bioinženirstvom, z njimi izmenjujeta izkušnje in jim pomagata

Nadalje pa si članice in čani IAS želimo tesnejšega sodelovanja, da skupaj z SKD opažamo pereče probleme stroke, jih rešujemo in odločevalcem skupaj predlagamo aktivnosti in najbolj kakovostne rešitve; tudi za relevante širše družbene probleme, ki vključujejo in potrebujejo naša znanja in izkušnje.

Čisto nazadnje in sploh ne najmanj pomembno, je omeniti prispevek ženskih kolegic k delu, uspehu in ugledu obeh institucij. Čeprav je danes diplomantk in doktorandk na področju kemije in kemijskega inženirstva v Sloveniji vsaj enako ali celo več, kar se delno odseva tudi članstvu SKD, so ženske dokaj slabo, le z nekaj odstotki zastopane v akademijah in med dobitniki najvišjih strokovnih priznanj. Če se vrnem na začetek nagovora – k Nobelovi nagradi – je bilo nagrajenk v 121. letih je samo pet, začenši z Marie Skłodowskiej Curie v letu 1911 in Jennifer Doudna v letu 2021!

Zato seveda potrebujemo podporo skupnosti in tudi kolegov!

shows how closely linked the missions of the Slovenian Chemical Society and the IAS really are. This is truly something we can be proud of at today's celebration!

I am also aware of the deep roots of knowledge, the innovative spirit and the ambitions of all my predecessors in the history of Slovenian chemical science and engineering, which have led both sciences to the successes that our researchers are today achieving at home and around the world. I, and we, can be proud and thankful today that we have had the opportunity to absorb all these benefits in the course of our studies and work. Today, therefore, I have the honour, as a member and as an organic chemistry or biochemical engineer, to congratulate the SCS on its anniversary on behalf of the President and all the members of the IAS.

At the same time, I would like to point out that both institutions have very similar ambitions and missions:

to promote the advancement of chemistry, chemical technology and chemical engineering in the broadest sense; to foster the professional development of its members and to work with all the organisations involved in the chemical and biochemical profession and bioengineering by sharing experience and assisting them.

Furthermore, IAS members would like to work more closely together with the SCS to identify pressing problems in the profession, solve them and jointly propose actions and the best solutions to decision makers; including for any relevant broader societal problems that involve and need our knowledge and experience.

Last but by no means least, it is important to note the contribution of female colleagues to the work, success and reputation of both institutions. Although the number of female graduates and PhD students in chemistry and chemical engineering in Slovenia today is at least equal or even higher, which is partly reflected in the membership of the SCS, women are rather poorly represented, i.e. only a few percent, in academies and among the winners of the highest professional awards. If I may return to the beginning of my address – to the Nobel Prize – there have been only five female Nobel Prize winners in 121 years, starting with Marie Skłodowska-Curie in 1911 and Jennifer Doudna in 2021!

So we obviously need the support of the community and also of our male colleagues!

Akad. prof. dr. Branko Stanovnik, predstavnik Slovenske akademije znanosti in umetnosti:

Spoštovani gospod predsednik SKD Dr. Peter Venturini,
Spoštovani ugledni gostje, kolegice in kolegi, dragi
prijatelji

V prijetno dolžnost mi je, da vas najprej pozdravim v imenu predsednika Slovenske akademije znanosti in umetnosti akademika Petra Štiha, ki se zaradi drugih obveznosti ni mogel udeležiti današnje slovesnosti, in izročim njegove pozdrave in čestitke SKD in vam ob tem pomembnem jubileju za vse imenitne dosežke, ki jih je društvo doseglo v svoji zgodovini. Obenem želi SKD še naprej veliko uspehov, predsedniku pa uspešno vodenje društva še naprej. Slovenska akademija znanosti in umetnosti je ponosna, da je bil prvi predsednik SKD član akademije in v mednarodnem svetu ugledni znanstveni Maks Samec.

2. 9. 1945 je bil Samec odstranjen z univerze. Njegovo nadaljnje delovanje je povezano z gradnjo instituta za kemijo, ki je bil ustanovljen hkrati s fizikalnim inštitutom Jožef Stefan in elektroinštitutom Milana Vidmarja v okviru Slovenske akademije znanosti in umetnosti. Od 1. 10. 1946 do 1959 je bil upravnik kemijskega laboratorija AZU (pozneje SAZU), ki se je 12. 6. 1953 preimenoval v Kemični inštitut Borisa Kidriča. Maks Samec je odigral pionirsko vlogo na področju organiziranja Slovenskega kemijskega društva, ki je bilo ustanovljeno 15. 12. 1951. Bil je njegov prvi predsednik 1951–1962 in častni predsednik 1963/64.

Ker je Komite za šolstvo in znanost Federativne republike Jugoslavije v Beogradu zahteval, da se naj znanstvena dela najprej objavijo v domačih strokovnih revijah, šele nato v tujini je Samec ustanovil najprej Zbornik in nato Vestnik Slovenskega kemijskega društva.

Zgodovina SKD na spletni strani je razmeroma skromna. Zato naj dodam še nekaj glede tega.

1. Uredništvo Vestnika Slovenskega kemijskega društva in preimenovaje v Acta Chimica Slovenica

Prof. Dušan Hadži me je kot predsednik SKD 1976 zaprosil, da bi prevzel uredništvo Vestnika, ki je do takrat zelo neredno izhajal. Kot novi urednik sem si zadal dve nalogi: 1. da bo Vestnik izhajal redno štirikrat na leto in 2. predlagal sem, da bi Vestnik preimenovali v Acta Chimica Slovenica. Glede rednega izhajanja mi je stvar uspela ob izdatni pomoči Marka Razingerja kot tehničnega urednika. Vestniku je bil kmalu priznan faktor vpliva. Glede preimenovanja pa je moj predlog leta 1976 popolnoma pogorel. Eksplicitno sta bila proti prof. Hadži in prof. Dolar. Nisem se hotel prepirati, sklenil sem počakati na ugodnejše čase. Počakal sem do razglasitve samostojne države. Potem, ko

Akad. prof. dr. Branko Stanovnik, representative of the Slovenian Academy of Sciences and Arts:

Honourable President of the SCS, Dr. Peter Venturini,
distinguished guests, colleagues, dear friends,

It is my pleasant duty first of all to greet you on behalf of the President of the Slovenian Academy of Sciences and Arts, Academician Peter Štih, who was unable to attend today's ceremony due to other commitments, and to convey his greetings and congratulations to the SCS and to you on this special anniversary for all the outstanding achievements that the Society has accomplished in its history. He also wishes the SCS many successes in the future and the President continued successful leadership of the Society. The Slovenian Academy of Sciences and Arts is proud that the first President of the SCS was a member of the Academy and internationally renowned scientist Maks Samec.

On 2 September 1945 Samec was removed from the university. His further activities were linked to the construction of the Institute of Chemistry, which was founded at the same time as the Jožef Stefan Institute and the Milan Vidmar Electric Power Research Institute under the auspices of the Slovenian Academy of Sciences and Arts. From 1 October 1946 to 1959, he was the manager of the chemical laboratory of the Academy of Sciences and Arts (later the Slovenian Academy of Sciences and Arts), which was renamed the Boris Kidrič Institute of Chemistry on 12 June 1953. Maks Samec had a pioneering role in the organisation of the Slovenian Chemical Society, which was founded on 15 December 1951. He was its first President from 1951 to 1962 and Honorary President in 1963/64.

Because the Committee for Education and Science of the Federal Republic of Yugoslavia in Belgrade demanded that scientific works should first be published in domestic professional journals, and then abroad, Samec founded first the Zbornik and then the Vestnik Slovenskega kemijskega društva.

There is relatively little written about the history of the SCS on its website. Allow me to add something to this topic.

1. The Editorial Board of the Vestnik Slovenskega kemijskega društva and the renaming to Acta Chimica Slovenica.

In 1976, Prof. Dušan Hadži, then President of the SCS, asked me to take over the editorship of the Vestnik, which until then had been published very irregularly. As the new editor, I set myself two tasks: 1. that the Vestnik would be published regularly four times a year, and 2. I proposed that the Vestnik be renamed Acta Chimica Slovenica. As regards regular publication, I succeeded with the substan-

je bilo SKD sprejeto 1992 v Federacijo evropskih kemijskih društev, sem kot urednik Vestnika predlagal spremembo naslova. Tokrat je bil predlog brez pripomb soglasno sprejet in leta 1993 je začel izhajati kot Acta Chimica Slovenica. Uredništvo so prevzeli mlajši ljudje, ki so ga ustrezno preoblikovali in digitalizirali in že v nekaj letih so Acta Chimica Slovenica postala mednarodno prepoznaven časopis.

2. Sprejem Slovenskega kemijskega društva v Federacijo evropskih kemijskih društev. Prvo mednarodno priznanje strokovnega društva v mednarodni organizaciji v samostojni Sloveniji.

V osemdesetih in devetdesetih letih prejšnjega stoletja sem bil najprej kot predstavnik Unije jugoslovanskih kemijskih društev, pozneje pa kot predstavnik Slovenskega kemijskega društva član Sveta Federacije evropskih kemijskih društev. Seja Sveta Federacije EKD je bila v Londonu 24. in 25. junija 1991. Ker je bilo takrat že jasno, kakšna bo usoda Jugoslavije, sem situacijo pojasnil in se dogovoril s predsednikom Sveta Federacije evropskih kemijskih društev dr. Gowom, generalnim sekretarjem Royal Society of Chemistry in drugimi člani Sveta za sprejem Slovenskega kemijskega društva v Federacijo evropskih kemijskih društev. To ustno soglasje je bilo sprejeto nekaj ur pred razglasitvijo samostojne Slovenije. Ko sem zgodaj popoldne prišel na letališče v Londonu in sem se hotel prijaviti za let v Ljubljano, mi povedo, da je Adria let odpovedan, namesto tega pa leti letalo Air France. Izkazalo se je, da je Adria letalo letelo pod francosko zastavo in tako smo varno pristali v Ljubljani na predvečer razglasitve samostojne Slovenije. To je bilo zadnje letalo, ki je pristalo v Ljubljani pred desetdnevno vojno za Slovenijo. Tisto noč so tanki odpeljali iz vrhniške kasarne proti Brniku. Letališče je bilo nato nekaj mesecev zaprto.

Glede na to, da sem prinesel iz London ustno zagotovilo o priznanju Slov. kem. društva, je prof. Ljubo Golič, tedanji predsednik Slovenskega kemijskega društva, pripravil pisno vlogo na Federacijo, ki je bila obravnavana na Seji Sveta Federacije evr. kem. društev v Varšavi na sedežu Polske akademije znanosti 22. junija 1992. Slovenija je bila sprejeta z aplavzom brez kakršne koli pripombe ali komentarja. To je prvo mednarodno priznanje nekega strokovnega društva v mednarodni asociaciji.

Hvala lepa

tial support of Marko Razinger as technical editor. The Vestnik was soon recognised as having an impact factor. As for the renaming, my proposal in 1976 was completely rejected. Prof. Hadži and Prof. Dolar were explicitly against it. As I did not want to argue, I decided to wait for better times. I waited until the country declared independence. After the SCS was admitted to the Federation of European Chemical Societies in 1992, I, as editor of the Vestnik, proposed a change of its name. This time the proposal was unanimously adopted without objections and in 1993 the journal started to be published as Acta Chimica Slovenica. The Editorial Board was taken over by younger people, who reorganised and digitised it accordingly, and within a few years, Acta Chimica Slovenica became an internationally renowned journal.

2. The admission of the Slovenian Chemical Society to the Federation of European Chemical Societies. The first international recognition of a professional society by an international organisation in independent Slovenia.

In the 1980s and 1990s, I was a member of the Council of the Federation of European Chemical Societies, first as a representative of the Union of Yugoslav Chemical Societies, and later as a representative of the Slovenian Chemical Society. The Council of the Federation of European Chemical Societies met in London on 24 and 25 June 1991. At the time, it was already clear what the fate of Yugoslavia would be, so I explained the situation and agreed with the President of the Council of the Federation of European Chemical Societies, Dr. Gow, the General Secretary of the Royal Society of Chemistry and other members of the Council that we would admit the Slovenian Chemical Society to the Federation of European Chemical Societies. This oral consent was given a few hours before the declaration of Slovenia's independence. When I arrived at the airport in London in the early afternoon to check in for my flight to Ljubljana, I was told that Adria's flight had been cancelled and that Air France was flying instead. It turned out that Adria's plane was flying under the French flag, which allowed us to land safely in Ljubljana on the eve of Slovenia's declaration of independence. This was the last plane to land in Ljubljana before the Ten-Day War for Slovenia. That night, tanks started rolling out of the Vrhnika barracks towards Brnik. The airport was closed for several months after that.

As I had brought from London a verbal assurance that the Slovenian Chemical Society would be recognised, Prof. Ljubo Golič, then President of the Slovenian Chemical Society, prepared a written application for the Federation, which was discussed at the Warsaw meeting of the Council of the Federation of European Chemical Societies at the headquarters of the Polish Academy of Sciences on 22 June 1992. Slovenia was admitted with applause and without any remarks or comments. This is the first international recognition of a professional society by an international association.

Thank you.

Prof. dr. Venčeslav Kaučič, častni predsednik SKD:

Spoštovane in drage kolegice in kolegi, prisrčno pozdravljeni.

Posebej želim pozdraviti, jim čestitati in se jim zahvaliti za njihov doprinos k delovanju in uspehom društva današnjim slavljenecem, novim častnim in novim zaslužnim članom društva.

I also warmly welcome our dear guests from abroad, with whom we were meeting and cooperated closely for many years. Today we thank them for their contribution to the professional growth of our society and for their help in integrating our society into international professional organizations and international connections by awarding them the title of honorary member of the Slovenian Chemical Society.

Zelo na kratko želim navesti nekaj utrinkov o razvoju in delovanju društva v preteklih sedemdesetih letih. Kot smo že slišali je bil pobudnik ustanovitve in prvi predsednik Prof. Maks Samec. Za njim so ga vodili izjemni, svetovno znani znanstveniki in inženirji: prof. Roman Modic (od 1963 do 1974), akad. prof. Dušan Hadži (od 1974 do 1986), akad. prof. Ljubo Golič (od 1986 do 1996) in v novejšem času prof. Venčeslav Kaučič (od 1996 do 2017), prof. Albin Pintar (od 2017 do 2021) in od 2021 ga vodi dr. Peter Venturini.

Zanimiva je bila moja včlanitev in nato 50 let delovanja v društvu in v mednarodnih združenjih kemikov. Na podelitvi visokošolske diplome leta 1973 sem dobil vabilo za včlanitev v SKD. Še isti dan sem šel v pisarno društva na Kemijskem inštitutu, kjer sem srečal takratnega tajnika društva prof. Marcela Žorgo, ki me je vpisal v društvo pod vpisno št. 305. Kupil sem še Laboratorijski priročnik, ki ga je izdalo društvo in mi je bil v tistem času, ko je bilo na razpolago malo strokovnih knjig v slovenskem in v tujih jezikih, v veliko pomoč.

Leta 1986 sem bil izvoljen za tajnika društva in v tem svojstvu deloval do leta 1996, ko sem bil na občnem zboru, ki je potekal na konferenci Slovenski kemijski dnevi v Mariboru, izvoljen za predsednika društva.

To je bilo na dan, ko se je Prof. Miha Japelj veselil rojstva svoje prve vnučke in sva imela razlog več za proslavljanje. Prof. Japelj se tega zagotovo dobro spominja.

Funkcijo predsednika društva sem z veseljem in spoštovanjem opravljal do leta 2017. Posebej sem si prizadeval za članstvo društva v uglednih mednarodnih strokovnih združenjih in aktivno delovanje naših članov v njih. Prepričan sem, da so naši člani s svojim strokovnim delovanjem primerno promovirali slovensko znanost v mednarodni znanstveni srenji.

Prof. dr. Venčeslav Kaučič, Honorary President of the SCS:

Ladies and gentlemen, dear colleagues, a warm welcome.

I would also like to extend a special welcome, congratulations and thanks for their contribution to the operation and success of the Society to today's honorees, the new Honorary Members and the new Emeritus Members of the Society.

I also warmly welcome our dear guests from abroad, with whom we have been meeting and cooperating closely for many years. Today, we thank them for their contribution to the professional growth of our Society and for their help in integrating our Society into international professional organisations and international connections by awarding them the title of Honorary Member of the Slovenian Chemical Society.

I would like to give you, very briefly, some highlights from the development and activities of the Society over the past 70 years. As we have already heard, the initiator and first President was Professor Maks Samec. After him, the Society was led by outstanding, world-renowned scientists and engineers: Prof. Roman Modic (from 1963 to 1974), Acad. Prof. Dušan Hadži (from 1974 to 1986), Acad. Prof. Ljubo Golič (from 1986 to 1996) and more recently Prof. Venčeslav Kaučič (from 1996 to 2017), Prof. Albin Pintar (from 2017 to 2021), and since 2021 it has been led by Dr. Peter Venturini.

My becoming a member and then 50 years of service in the Society and in international associations of chemists was interesting. I received an invitation to join the SCS at my university graduation ceremony in 1973. On the same day, I went to the Society's office at the National Institute of Chemistry, where I met the then Secretary of the Society, Prof. Marcel Žorga, who enrolled me in the Society under registration number 305. I also bought the Laboratory Manual published by the Society, which was a great help to me at that time, because there were few scientific books available in Slovenian or in foreign languages.

In 1986, I was elected Secretary of the Society and served in this capacity until 1996, when I was elected President at the general assembly held at the Slovenian Chemical Days in Maribor.

This was on the day Prof. Miha Japelj was celebrating the birth of his first granddaughter and we had an additional reason to celebrate. I am sure Prof. Japelj remembers this well.

I have served as President of the Society with pleasure and respect until 2017. It was always my goal that the Society would become a member of renowned international professional associations and that our members would be

Društvo aktivno sodeluje tudi s številnimi društvi na bilateralni ravni, z društvi iz naše bližnje okolice, v evropskem prostoru in tudi z društvi iz drugih kontinentov.

Leta 2017 sem bil izvoljen za častnega predsednika Slovenskega kemijskega društva, na kar sem ponosen. Od 1986 do 2017 (mandat tajnika in nato predsednika) je več kot 30 let in prof. Pejovnik mi je večkrat rekel, da zanj priimek Kaučič hkrati pomeni kemijsko društvo in obratno, da kemijsko društvo hkrati pomeni Kaučič. Hvala ti, Stane.

Morda omenim še, da sem bil preko 30 let aktiven v IUPAC-u. Letos je izšel IUPAC-ov periodni sistem, preveden v 26 svetovnih jezikov. Na svetu obstaja med 6000 in 7000 jezikov. Ponosno povem, da je izšel tudi v slovenskem jeziku (eden od 26 prevodov).

Zahvaljujem se za vsestransko podporo društvu s strani pomembnih industrijskih partnerjev, univerz, znanstvenih in strokovnih inštitutov ter ministrstva za šolstvo, znanost in šport in Javne agencije za raziskovalno dejavnost Republike Slovenije.

Hkrati si želim, da društvo strokovno raste še naprej in da z dejavnostmi aktivno nadaljuje v naslednjih letih ter jih tudi nadgrajuje.

Hvala za vašo pozornost, po koncu te slovesnosti pa vam želim veselo, prijazno in sproščujoče druženje.

active in them. I am confident that our members have adequately promoted Slovenian science in the international scientific community through their professional activities.

The Society also actively and bilaterally cooperates with a number of societies, with societies in our immediate surroundings, in the European area and also with societies from other continents.

In 2017, I was elected Honorary President of the Slovenian Chemical Society, which I am proud of. The period from 1986 to 2017 (my service as Secretary and then President) was longer than 30 years, and Prof. Pejovnik told me several times that, for him, the surname Kaučič is synonymous with the Chemical Society and vice versa, that the Chemical Society also means Kaučič. Thank you for that, Stane.

I would also like to mention that I have been active in the IUPAC for over 30 years. This year, the IUPAC Periodic Table was published, translated into 26 world languages. There are between 6000 and 7000 languages in the world. I am proud to say that it has also been published in Slovenian (one of 26 translations).

For their comprehensive support provided to the Society, I would like to extend my thanks to the important industrial partners, universities, scientific and professional institutes, the Ministry of Education, Science and Sport and the Slovenian Research Agency.

At the same time, I would like to see the Society continue to grow professionally and to actively continue and build on its activities in the coming years.

Thank you for your attention and have a happy, pleasant and relaxing time after this ceremony.

Seznam nagrajencev

Častni člani:

1. Prof. dr. Peter Glavič
2. Akademik prof. dr. Branko Stanovnik
3. Zasl. prof. dr. Marjan Veber
4. Prof. dr. Jean Marie Lehn
5. Prof. dr. Wolfram Koch
6. Prof. dr. Pavel Drašar
7. Prof. dr. Andrej Šmalc
8. Prof. dr. Leiv K. Sydnes

Zaslužni člani:

1. Dr. Vida Hudnik
2. Prof. dr. Darinka Brodnjak Vončina
3. Prof. dr. Majda Žigon
4. Mag. Alenka Gogala
5. Mija Marin, dipl. inž. kem. tehnologije
6. Prof. dr. Miha Japelj
7. Zasl. prof. dr. Stane Pejovnik
8. Prof. dr. Aleksander Pavko
9. Prof. dr. Lucija Zupančič Kralj

Zaslužne institucije:

1. Kemijski inštitut
2. Institut „Jožef Stefan“
3. Fakulteta za kemijo in kemijsko tehnologijo, UL
4. Fakulteta za kemijo in kemijsko tehnologijo, UM
5. Cinkarna Celje, d.d.
6. Krka, d.d., Novo mesto
7. Kemomed, d.o.o.
8. AquafilSLO d.o.o.
9. Mettler Toledo d.o.o.
10. MIKRO+POLO d.o.o.
11. DONAU Lab d.o.o.

Priznanja za delo v uredništvu

Acta Chimica Slovenica:

1. Janez Košmrlj
2. Aleksander Pavko
3. Ksenija Kogej
4. Marija Bešter-Rogač
5. Matija Strlič
6. Mladen Franko
7. Alojz Demšar
8. Andrej Petrič
9. Bert VW Maes
10. Janez Cerkovnik
11. Barbara Malič
12. Krištof Kranjc
13. Damjana Rozman
14. Primož Šegedin
15. Boris Pihlar
16. Johannes T. Van Elteren
17. Michael Beeston
18. Irena Vovk
19. Helena Prosen
20. Melita Tramšek
21. Franc Perdih
22. Aleš Podgornik
23. Alen Albreht
24. Aleš Berlec
25. Mirela Dragomir
26. Matjaž Kristl
27. Vinko Vovk
28. Stanislav Oražem
29. Olga Gorše
30. Marjana Gantar Albreht

KOLEDAR VAŽNEJŠIH ZNANSTVENIH SREČANJ S PODROČJA KEMIJE IN KEMIJSKE TEHNOLOGIJE

SCIENTIFIC MEETINGS – CHEMISTRY AND CHEMICAL ENGINEERING

2023

January 2023

- 1 EUROPEAN FOOD CHEMISTRY CONGRESS XXI – EuroFoodChem XXI
Belgrade, Serbia
Information: <http://horizon2020foodentwin.rs/eurofoodchemxxi/>

February 2023

- 8 – 11 EMBO WORKSHOP IN SITU STRUCTURAL BIOLOGY: FROM CRYO-EM TO MULTI-
SCALE MODELLING
Heidelberg, Germany
Information: <https://www.embl.org/about/info/course-and-conference-office/events/iss23-01/>

March 2023

- 20 – 23 VIII INTERNATIONAL CONGRESS “ENGINEERING, ENVIRONMENT AND MATERIALS
IN PROCESS INDUSTRY
Jahorina, Bosnia and Hercegovina
Information: <https://eem.tfzv.ues.rs.ba/>

April 2023

- 16 – 21 HTCC 5
Dubrovnik, Croatia
Information: <https://htcc5.org/>

May 2023

- 16 – 17 EUROPEAN CONFERENCE ON CO₂ CAPTURE, STORAGE & REUSE 2023
Copenhagen, Denmark
- 21 – 25 PPEPPD 2023
Tarragona, Spain
Information: <https://ppeppd.org/ppeppd2023/>
- 29 – June 2 15TH MEDITERRANEAN CONGRESS OF CHEMICAL ENGINEERING – MECCE
Barcelona, Spain
Information: <https://www.mecce.org/>
- 31 – June 2 8TH EUROPEAN PROCESS INTENSIFICATION CONFERENCE
Warsaw, Poland
Information: <https://www.epic2023.pw.edu.pl/index/>

July 2023

- 2 – 6 FEZA 2023 – 9TH CONFERENCE OF THE FEDERATION OF THE EUROPEAN ZEOLITE ASSOCIATIONS
Portorož-Portorose, Slovenia
Information: <https://feza2023.org/en/>
- 2 – 7 XV POSTGRADUATE SUMMER SCHOOL ON GREEN CHEMISTRY
Venice, Italy
Information: <https://www.greenchemistry.school/>
- 9 – 14 38TH INTERNATIONAL CONFERENCE ON SOLUTION CHEMISTRY
Belgrade, Serbia
Information: <https://isc2023.pmf.uns.ac.rs/>
- 7 – 11 9TH EUCHEMS CHEMISTRY CONGRESS (ECC9)
Dublin, Ireland

Acta Chimica Slovenica

Author Guidelines

Submissions

Submission to ACSi is made with the implicit understanding that neither the manuscript nor the essence of its content has been published in whole or in part and that it is not being considered for publication elsewhere. All the listed authors should have agreed on the content and the corresponding (submitting) author is responsible for having ensured that this agreement has been reached. The acceptance of an article is based entirely on its scientific merit, as judged by peer review. There are no page charges for publishing articles in ACSi. The authors are asked to read the Author Guidelines carefully to gain an overview and assess if their manuscript is suitable for ACSi.

Additional information

- Citing spectral and analytical data
- Depositing X-ray data

Submission material

Typical submission consists of:

- full manuscript (PDF file, with title, authors, abstract, keywords, figures and tables embedded, and references)
- supplementary files
 - **Full manuscript** (original Word file)
 - **Statement of novelty** (Word file)
 - **List of suggested reviewers** (Word file)
 - **ZIP file containing graphics** (figures, illustrations, images, photographs)
 - **Graphical abstract** (single graphics file)
 - **Proposed cover picture** (optional, single graphics file)
 - **Appendices** (optional, Word files, graphics files)

Incomplete or not properly prepared submissions will be rejected.

Submission process

Before submission, authors should go through the checklist at the bottom of the page and prepare for submission.

Submission process consists of 5 steps.

Step 1: Starting the submission

- Choose one of the journal sections.
- Confirm all the requirements of the **checklist**.
- Additional plain text comments for the editor can be provided in the relevant text field.

Step 2: Upload submission

- Upload full manuscript in the form of a Word file (with title, authors, abstract, keywords, figures and tables embedded, and references).

Step 3: Enter metadata

- First name, last name, contact email and affiliation for all authors, in relevant order, must be provided. Corresponding author has to be selected. Full postal address and phone number of the corresponding author has to be provided.

- **Title and abstract** must be provided in plain text.
- Keywords must be provided (max. 6, separated by semicolons).
- Data about contributors and supporting agencies may be entered.
- **References** in plain text must be provided in the relevant text field.

Step 4: Upload supplementary files

- Original Word file (original of the PDF uploaded in the step 2)
- **List of suggested reviewers** with at least five reviewers with two recent references from the field of submitted manuscript must be uploaded as a Word file. At the same time, authors should declare (i) that they have no conflict of interest with suggested reviewers and (ii) that suggested reviewers are experts in the field of the submitted manuscript.
- All **graphics** have to be uploaded in a single ZIP file. Graphics should be named Figure 1.jpg, Figure 2.eps, etc.
- **Graphical abstract image** must be uploaded separately
- **Proposed cover picture** (optional) should be uploaded separately.
- Any additional **appendices** (optional) to the paper may be uploaded. Appendices may be published as a supplementary material to the paper, if accepted.
- For each uploaded file the author is asked for additional metadata which may be provided. Depending of the type of the file please provide the relevant title (Statement of novelty, List of suggested reviewers, Figures, Graphical abstract, Proposed cover picture, Appendix).

Step 5: Confirmation

- Final confirmation is required.

Article Types

Feature Articles are contributions that are written on Editor's invitation. They should be clear and concise summaries of the author's most recent work written with the broad scope of ACSi in mind. They are intended to be general overviews of the authors' subfield of research but should be written in a way that engages and informs scientists in other areas. They should contain the following (see also general guidelines for article structure below): (1) an introduction that acquaints readers with the authors' research field and outlines the important questions for which answers are being sought; (2) interesting, novel, and recent contributions of the author(s) to the field; and (3) a summary that presents possible future directions. Manuscripts should normally not exceed 40 pages of one column format (font size 12, 33 lines per page). Generally, experts who have made an important contribution to a specific field in recent years will be invited by the Editor to contribute a **Feature Article**. Individuals may, however, send a proposal (of no more than one page) for a **Feature Article** to the Editor-in-Chief for consideration.

Scientific articles should report significant and innovative achievements in chemistry and related sciences and should exhibit a high level of originality. They should have the following structure:

1. Title (max. 150 characters),
2. Authors and affiliations,
3. Abstract (max. 1000 characters),
4. Keywords (max. 6),
5. Introduction,
6. Experimental,
7. Results and Discussion,
8. Conclusions,
9. Acknowledgements,
10. References.

The sections should be arranged in the sequence generally accepted for publications in the respective fields and should be successively numbered.

Short communications generally follow the same order of sections as Scientific articles, but should be short (max. 2500 words) and report a significant aspect of research work meriting separate publication. Editors may decide that a Scientific paper is categorized as a Short Communication if its length is short.

Technical articles report applications of an already described innovation. Typically, technical articles are not based on new experiments.

Preparation of Submissions

Text of the submitted articles must be prepared with Microsoft Word. Normal style set to single column, 1.5 line spacing, and 12 pt Times New Roman font is recommended. Line numbering (continuous, for the whole document) must be enabled to simplify the reviewing process. For any other format, please consult the editor. Articles should be written in English. Correct spelling and grammar are the sole responsibility of the author(s). Papers should be written in a concise and succinct manner. The authors shall respect the ISO 80000 standard [1], and IUPAC Green Book [2] rules on the names and symbols of quantities and units. The Système International d'Unités (SI) must be used for all dimensional quantities.

Graphics (figures, graphs, illustrations, digital images, photographs) should be inserted in the text where appropriate. The captions should be self-explanatory. Lettering should be readable (suggested 8 point Arial font) with equal size in all figures. Use common programs such as MS Excel or similar to prepare figures (graphs) and ChemDraw to prepare structures in their final size. Width of graphs in the manuscript should be 8 cm. Only in special cases (in case of numerous data, visibility issues) graphs can be 17 cm wide. All graphs in the manuscript should be inserted in relevant places and **aligned left**. The same graphs should be provided separately as images of appropriate resolution (see below) and submitted together in a ZIP file (Graphics ZIP). Please do not submit figures as a Word file. In **graphs**, only the graph area determined by both axes should be in the frame, while a frame around the whole graph should be omitted. The graph area should be white. The legend should be inside the graph area. The style of all graphs should be the same. **Figures and illustrations** should be of sufficient quality for the printed version, i.e. 300 dpi minimum. **Digital images and photographs** should be of high quality (minimum

250 dpi resolution). On submission, figures should be of good enough resolution to be assessed by the referees, ideally as JPEGs. High-resolution figures (in JPEG, TIFF, or EPS format) might be required if the paper is accepted for publication.

Tables should be prepared in the Word file of the paper as usual Word tables. The captions should appear above the table and should be self-explanatory.

References should be numbered and ordered sequentially as they appear in the text, likewise methods, tables, figure captions. When cited in the text, reference numbers should be superscripted, following punctuation marks. It is the sole responsibility of authors to cite articles that have been submitted to a journal or were in print at the time of submission to ACSi. Formatting of references to published work should follow the journal style; please also consult a recent issue:

1. J. W. Smith, A. G. White, *Acta Chim. Slov.* **2008**, *55*, 1055–1059.
2. M. F. Kemmere, T. F. Keurentjes, in: S. P. Nunes, K. V. Peinemann (Ed.): *Membrane Technology in the Chemical Industry*, Wiley-VCH, Weinheim, Germany, **2008**, pp. 229–255.
3. J. Levec, Arrangement and process for oxidizing an aqueous medium, US Patent Number 5,928,521, date of patent July 27, **1999**.
4. L. A. Bursill, J. M. Thomas, in: R. Sersale, C. Collola, R. Aiello (Eds.), *Recent Progress Report and Discussions: 5th International Zeolite Conference*, Naples, Italy, 1980, Gianini, Naples, **1981**, pp. 25–30.
5. J. Szegezdi, F. Csizmadia, Prediction of dissociation constant using microconstants, http://www.chemaxon.com/conf/Prediction_of_dissociation_constant_using_microconstants.pdf, (assessed: March 31, 2008)

Titles of journals should be abbreviated according to Chemical Abstracts Service Source Index (CASSI).

Special Notes

- Complete characterization, **including crystal structure**, should be given when the synthesis of new compounds in crystal form is reported.
- Numerical **data should be reported with the number of significant digits corresponding to the magnitude** of experimental uncertainty.
- **The SI system of units and IUPAC recommendations** for nomenclature, symbols and abbreviations should be followed closely. Additionally, the authors should follow the general guidelines when citing spectral and analytical data, and depositing crystallographic data.
- **Characters** should be correctly represented throughout the manuscript: for example, 1 (one) and l (ell), 0 (zero) and O (oh), x (ex), D7 (times sign), B0 (degree sign). Use Symbol font for all Greek letters and mathematical symbols.
- The rules and recommendations of the **IUBMB** and the **International Union of Pure and Applied Chemistry (IUPAC)** should be used for abbreviation of chemical names, nomenclature of chemical compounds, enzyme nomenclature, isotopic compounds, optically active isomers, and spectroscopic data.
- **A conflict of interest** occurs when an individual (author, reviewer, editor) or its organization is in-

volved in multiple interests, one of which could possibly corrupt the motivation for an act in the other. Financial relationships are the most easily identifiable conflicts of interest, while conflicts can occur also as personal relationships, academic competition, etc. **The Editors** will make effort to ensure that conflicts of interest will not compromise the evaluation process; potential editors and reviewers will be asked to exempt themselves from review process when such conflict of interest exists. When the manuscript is submitted for publication, **the authors** are expected to disclose any relationships that might pose potential conflict of interest with respect to results reported in that manuscript. In the Acknowledgement section the source of funding support should be mentioned. The statement of disclosure must be provided as Comments to Editor during the submission process.

- **Published statement of Informed Consent.** Research described in papers submitted to ACSi must adhere to the principles of the Declaration of Helsinki (<http://www.wma.net/e/policy/b3.htm>). These studies must be approved by an appropriate institutional review board or committee, and informed consent must be obtained from subjects. The Methods section of the paper must include: 1) a statement of protocol approval from an institutional review board or committee and 2), a statement that informed consent was obtained from the human subjects or their representatives.
- **Published Statement of Human and Animal Rights.** When reporting experiments on human subjects, authors should indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. If doubt exists whether the research was conducted in accordance with the Helsinki Declaration, the authors must explain the rationale for their approach and demonstrate that the institutional review body explicitly approved the doubtful aspects of the study. When reporting experiments on animals, authors should indicate whether the institutional and national guide for the care and use of laboratory animals was followed.
- To avoid conflict of interest between authors and referees we expect that not more than one referee is from the same country as the corresponding author(s), however, not from the same institution.
- Contributions authored by **Slovenian scientists** are evaluated by non-Slovenian referees.
- Papers describing **microwave-assisted reactions** performed in domestic microwave ovens are not considered for publication in *Acta Chimica Slovenica*.
- *Manuscripts that are **not prepared and submitted** in accord with the instructions for authors are not considered for publication.*

Appendices

Authors are encouraged to make use of supporting information for publication, which is supplementary material (appendices) that is submitted at the same time as the manuscript. It is made available on the Journal's

web site and is linked to the article in the Journal's Web edition. The use of supporting information is particularly appropriate for presenting additional graphs, spectra, tables and discussion and is more likely to be of interest to specialists than to general readers. When preparing supporting information, authors should keep in mind that the supporting information files will not be edited by the editorial staff. In addition, the files should be not too large (upper limit 10 MB) and should be provided in common widely known file formats to be accessible to readers without difficulty. All files of supplementary materials are loaded separately during the submission process as supplementary files.

Proposed Cover Picture and Graphical Abstract Image

Graphical content: an ideally full-colour illustration of resolution 300 dpi from the manuscript must be proposed with the submission. Graphical abstract pictures are printed in size 6.5 x 4 cm (hence minimal resolution of 770 x 470 pixels). Cover picture is printed in size 11 x 9.5 cm (hence minimal resolution of 1300 x 1130 pixels)

Authors are encouraged to submit illustrations as candidates for the journal Cover Picture*. The illustration must be related to the subject matter of the paper. Usually both proposed cover picture and graphical abstract are the same, but authors may provide different pictures as well.

* The authors will be asked to contribute to the costs of the cover picture production.

Statement of novelty

Statement of novelty is provided in a Word file and submitted as a supplementary file in step 4 of submission process. Authors should in no more than 100 words emphasize the scientific novelty of the presented research. Do not repeat for this purpose the content of your abstract.

List of suggested reviewers

List of suggested reviewers is a Word file submitted as a supplementary file in step 4 of submission process. Authors should propose the names, full affiliation (department, institution, city and country) and e-mail addresses of five potential referees. Field of expertise and at least two references relevant to the scientific field of the submitted manuscript must be provided for each of the suggested reviewers. The referees should be knowledgeable about the subject but have no close connection with any of the authors. In addition, referees should be from institutions other than (and countries other than) those of any of the authors. Authors declare no conflict of interest with suggested reviewers. Authors declare that suggested reviewers are experts in the field of submitted manuscript.

How to Submit

Users registered in the role of author can start submission by choosing USER HOME link on the top of the page, then choosing the role of the Author and follow the relevant link for starting the submission process. Prior to submission we strongly recommend that you familiarize yourself with the ACSi style by browsing the journal, particularly if you have not submitted to the ACSi before or recently.

Correspondence

All correspondence with the ACSi editor regarding the paper goes through this web site and emails. Emails are sent and recorded in the web site database. In the correspondence with the editorial office please provide ID number of your manuscript. All emails you receive from the system contain relevant links. **Please do not answer the emails directly but use the embedded links in the emails for carrying out relevant actions.** Alternatively, you can carry out all the actions and correspondence through the online system by logging in and selecting relevant options.

Proofs

Proofs will be dispatched via e-mail and corrections should be returned to the editor by e-mail as quickly as possible, normally within 48 hours of receipt. Typing errors should be corrected; other changes of contents will be treated as new submissions.

Submission Preparation Checklist

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

1. The submission has not been previously published, nor is it under consideration for publication in any other journal (or an explanation has been provided in Comments to the Editor).
2. All the listed authors have agreed on the content and the corresponding (submitting) author is responsible for having ensured that this agreement has been reached.
3. The submission files are in the correct format: manuscript is created in MS Word but will be **submitted in PDF** (for reviewers) as well as in original MS Word format (as a supplementary file for technical editing); diagrams and graphs are created in Excel and saved in one of the file formats: TIFF, EPS or JPG; illustrations are also saved in one of these formats. The preferred position of graphic files in a document is to embed them close to the place where they are mentioned in the text (See **Author guidelines** for details).
4. The manuscript has been examined for spelling and grammar (spell checked).
5. The **title** (maximum 150 characters) briefly explains the contents of the manuscript.
6. Full names (first and last) of all authors together with the affiliation address are provided. Name of author(s) denoted as the corresponding author(s), together with their e-mail address, full postal address and telephone/fax numbers are given.
7. The **abstract** states the objective and conclusions of the research concisely in no more than 150 words.
8. Keywords (minimum three, maximum six) are provided.
9. **Statement of novelty** (maximum 100 words) clearly explaining new findings reported in the manuscript should be prepared as a separate Word file.
10. The text adheres to the stylistic and bibliographic requirements outlined in the **Author guidelines**.
11. Text in normal style is set to single column, 1.5 line spacing, and 12 pt. Times New Roman font is

recommended. All tables, figures and illustrations have appropriate captions and are placed within the text at the appropriate points.

12. Mathematical and chemical equations are provided in separate lines and numbered (Arabic numbers) consecutively in parenthesis at the end of the line. All equation numbers are (if necessary) appropriately included in the text. Corresponding numbers are checked.
13. Tables, Figures, illustrations, are prepared in correct format and resolution (see **Author guidelines**).
14. The lettering used in the figures and graphs do not vary greatly in size. The recommended lettering size is 8 point Arial.
15. Separate files for each figure and illustration are prepared. The names (numbers) of the separate files are the same as they appear in the text. All the figure files are packed for uploading in a single ZIP file.
16. Authors have read **special notes** and have accordingly prepared their manuscript (if necessary).
17. References in the text and in the References are correctly cited. (see **Author guidelines**). All references mentioned in the Reference list are cited in the text, and vice versa.
18. Permission has been obtained for use of copyrighted material from other sources (including the Web).
19. The names, full affiliation (department, institution, city and country), e-mail addresses and references of five potential referees from institutions other than (and countries other than) those of any of the authors are prepared in the word file. At least two relevant references (important recent papers with high impact factor, head positions of departments, labs, research groups, etc.) for each suggested reviewer must be provided. Authors declare no conflict of interest with suggested reviewers. Authors declare that suggested reviewers are experts in the field of submitted manuscript.
20. Full-colour illustration or graph from the manuscript is proposed for graphical abstract.
21. **Appendices** (if appropriate) as supplementary material are prepared and will be submitted at the same time as the manuscript.

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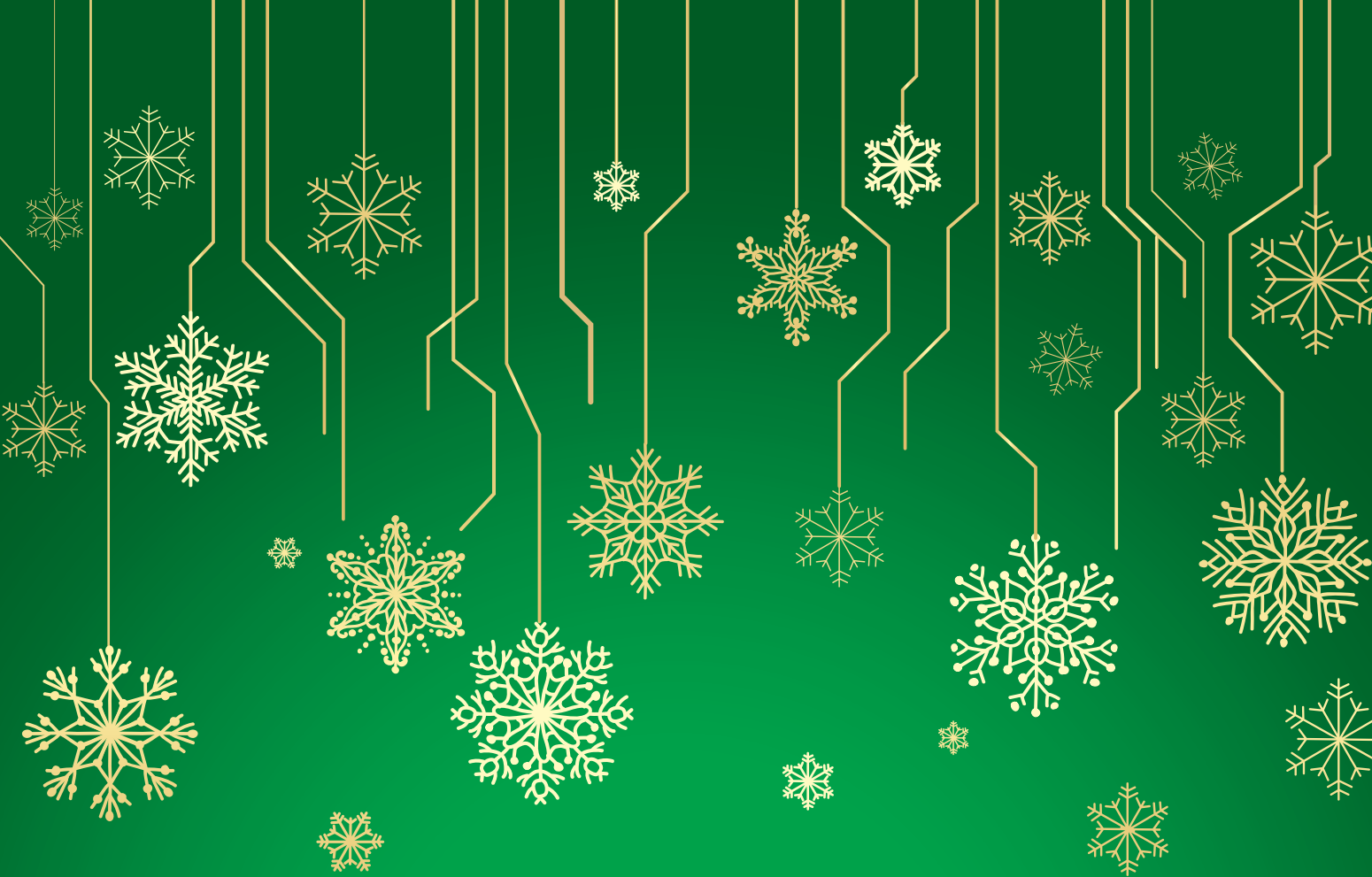
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The significance of nitrogen- and oxygen-heterocycles in many areas of life is well-known, however, the preparation of new derivatives remains important. The multicomponent synthesis of potentially biologically active heterocycles containing a phosphonate or a phosphine oxide moiety was performed (page 735).



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