

DRUŠTVENE VESTI IN DRUGE AKTIVNOSTI
SOCIETY NEWS, ANNOUNCEMENTS, ACTIVITIES

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Mednarodna kemijska olimpijada 2018

Andrej Godec
UL, FKKT

Letošnja mednarodna kemijska olimpijada je bila jubilejna. Vse skupaj se je namreč začelo leta 1968 v takratni Čehoslovaški republiki. Zato sta se za organizacijo letošnje, 50. mednarodne kemijske olimpijade, skupaj prijaviteli Češka in Slovaška Republika.

Olimpijada je potekala od 19. do 29.7.2018; začeli smo v Bratislavi, in se kasneje preselili še v Prago. Olimpijade se je udeležila naslednja ekipa: Vid Kermelj, Martin Rihtaršič (oba srebrna medalja, in oba iz gimnazije Škofja Loka), Jože Gašperlin (bronasta medalja, gimnazija Kranj) in Nastja Medle (gimnazija Novo mesto). Vsem štirim čestitamo za res lep uspeh!

Ekipo sva vodila mentorja dr. Berta Košmrlj in dr. Andrej Godec, oba iz Fakultete za kemijo in kemijsko tehnologijo v Ljubljani.

Priprave na olimpijado in izbirna tekmovanja potekajo v Ljubljani. Letos je pri tem sodelovala naslednja ekipa FKKT: dr. Berta Košmrlj, dr. Helena Prosen, dr. Alojz Demšar, dr. Darko Dolenc, dr. Andrej Godec in dr. Jernej Markelj. Pomagali sta še Branka Miklavčič in Mojca Žitko.

Pri organizaciji udeležbe na olimpijadi sodelujemo z

Zvezo za tehniško kulturo Slovenije. Vsem se za pomoč najlepše zahvaljujemo.

Letošnje olimpijade se je udeležilo 300 tekmovalcev iz 76 držav. Vsaka država ima lahko največ štiri tekmovalce, in dva mentorja. Zastopani so pravzaprav že vsi kontinenti. Vsako leto pa pridejo tudi države opazovalke, ki potem že naslednje leto lahko pripeljejo tudi tekmovalce. Letos so to bile Gana, Luksemburg, Mali, Katar, Šrilanka in Združeni arabski emirati, tako da lahko že naslednje leto pričakujemo še več tekmovalcev.

Absolutni zmagovalec letošnje olimpijade je bil Qingyu Chen iz Kitajske (dosežek zaokroženih 94%), drugi je bil Rus Aleksej Konoplev (90%), in tretji Korejec Raymond Eugene Bahng (89%). Vsega skupaj je bilo podeljenih 35 zlatih, 65 srebrnih in 95 bronastih medalj. Naš dosežek je bil odličen: Vid je v absolutni konkurenci zasedel 67. mesto (73%), Martin 94. (66%) in Jože 140. (58%).

Na olimpijadi sta dva tekmovalna dneva: najprej je na vrsti praktično delo v laboratoriju, in kasneje še teoretični test. Vsak traja po pet ur.

Vloga mentorjev je usklajevanje in prevajanje besedil



Slovenska ekipa na 50. mednarodni kemijski olimpijadi. Z leve so Andrej Godec, Berta Košmrlj, Nastja Medle, Martin Rihtaršič, Jože Gašperlin, Vid Kermelj, in Eliška Lieberzeitová, vodička naše ekipe.

nalog, kar nam vzame večino časa. Na koncu naloge svoje ekipe popraviva, in ocene usklajujeva z organizatorjevimi na arbitraži.

Otvoritev letošnje olimpijade je bila 21.7. v dvorani Stará Tržnica v centru Bratislave. Gre za dogodek najvišjega ranga v državi organizatoriki, zato so tam predstavniki politike, stroke in medijev, otvoritev pa je tudi priložnost, da država organizatorica predstavi svoje dosežke in kulturo. Udeležence so letos najprej pozdravili predstavniki ministrstev Slovaške in Češke republike, ter zatem še rektorja obeh univerz, organizatorik olimpijade. Na Slovaškem je to bila Univerza Comenius (CU, *Univerzita Komenského*), največja in najstarejša v tem delu sveta. Tradicija te univerze temelji na Akademiji Istropolitana, ki jo je leta 1465 v Bratislavi ustanovil madžarski kralj Matthias Corvinus. Soorganizatorica na češki strani je bila Vysoká škola chemicko-technologická (UCT) v Pragi.

Po uvodni slovesnosti smo mentorji odšli na ogled centra Bratislave in popoldne na večerjo in srečanje z dijaki na gradu Červený Kameň. Center Bratislave je podoben ljubljanskemu, le da je večji, v njem pa v glavnem prevladujejo turisti, tako da je kar nekam prazen.

Slovaška je sicer geografski center Evrope. Krasi jo lepa narava, pa naprimer 1600 mineralnih vrelcev, v katerih se je namakal tudi Ludwig van Beethoven. Ima najstarejše in največje rudnike opala na svetu; tukaj je bil najden najtežji, Harlekyn, ki ima kar 607 gramov. Oboje, dragi kamni in mineralna voda, je nastopalo tudi v nalogah, ki so jih reševali dijaki.



Slovaki radi šahirajo.

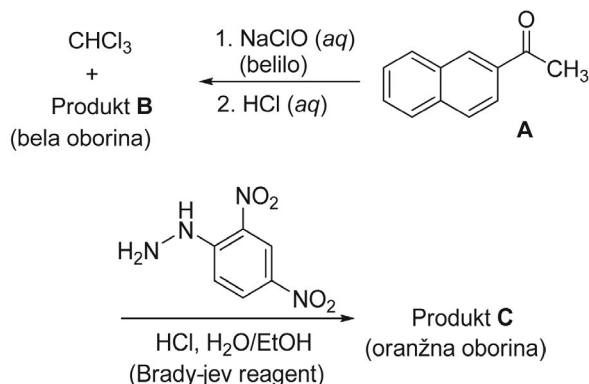


Laboratorijski pult tekmovalca.

Hrana je podobna naši, in tako kot naša tudi zelo dobra. Marija Terezija je kljub odporu prebivalcev tukaj uvedla sajenje krompirja, kar je rešilo takratni problem lakote, krompir pa je danes postal nacionalno živilo številka 1. Iz krompirjevega testa delajo razne cmoke in piroške, naprimer izvrstne *bryndzové pirohy*, ki so napolnjeni z ovčjo skuto. Ponudbo hrane dopolnjuje zelo popularno zelje, ter različno meso, od tega še največ govedina.

Mentorji smo drugi dan dopoldne opravili pregled laboratorijev na Univerzi Comenius, kjer bodo dijaki izvajali tri poskuse. Prvi tekmovalni dan na olimpijadi namreč pomeni praktično delo, mentorji pa moramo preveriti, ali je na pultih vsa oprema, ki jo bodo potrebovali.

Prva naloga v praktičnem delu je bila organska sinteza; sledila je izolacija produktov in analiza čistoče, ki je potekala s tankoplastno kromatografijo. Izhodna spojina reakcije je bil (2-naftil)etanon (na shemi A, 2-acetonafton), s katerim so izvedli haloformsko reakcijo (produkt B), ter potem še reakcijo z Bradyjevim reagentom (produkt C).



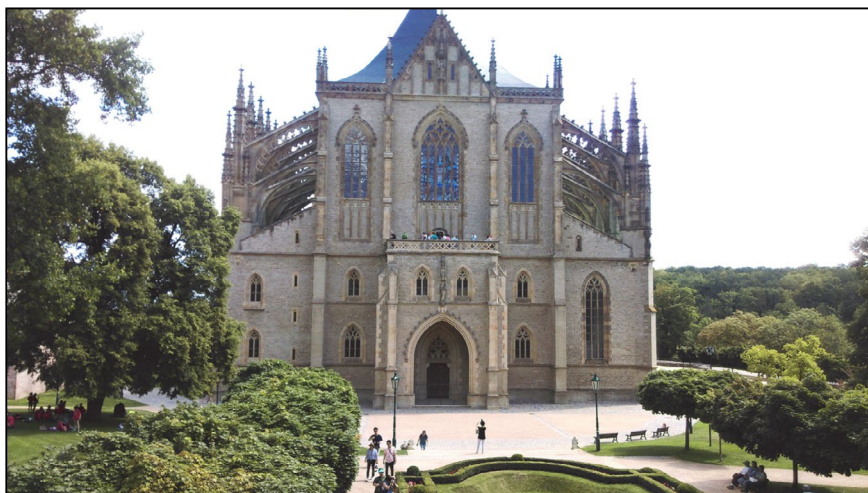
Pri tej nalogi so morali dijaki med drugim izvesti ekstrakcijo, ter vakuumsko filtracijo produktov.

Druga naloga je bila iz fizikalne kemije. Dijaki so določali kinetiko oscilirajoče reakcije; izhodna spojina je bil luminol, ki je vir kemoluminescence. V prisotnosti primerne katalizatorja, npr. Cu^{2+} , lahko reagira z oksidanti, najbolj pogosto z H_2O_2 , pri čemer nastanejo produkti v vzbujenem elektronskem stanju. Ti produkti sprostitjo presežno energijo z oddajanjem modre svetlobe. Celoten postopek lahko z dodatkom cisteina spremenimo v oscilirajočo reakcijo, pri kateri se pojavi svetloba po določenem indukcijskem času. Ko se ves cistein porabi, postane baker ponovno katalitično aktiven, kar se pokaže z bliskom modre svetlobe. Čas, ki je potreben, da se pojavi blisk, so dijaki uporabili pri študiju hitrosti oksidacije cisteina, ki jo katalizira baker. S spreminjanjem koncentracij in reakcijskih pogojev so na koncu določili konstanti reakcijskih hitrosti v hitrostnem zakonu: $v = k_1[\text{H}_2\text{O}_2][\text{Cu}] + k_2[\text{Cu}]$. Avtorji te naloge so bili res izčrpani, saj so upoštevali tudi temperaturno odvisnost hitrosti reakcije in rezultate normalizirali na sobno temperaturo.

Tretja naloga v tem delu je bila analiza mineralnih vod, s katerimi je Slovaška res bogata. Najvišjo koncentra-



Jedilni list.



Kutná Hora.

cijo mineralov ima vrelec Solivar (292 g L^{-1}), najvišjo koncentracijo H_2S vrelec Smrdáky (292 g L^{-1}), največ CO_2 pa Korytnica ($3,8 \text{ g L}^{-1}$). Dijaki so med drugim izvedli kompleksometrično analizo z EDTA, in na koncu ugotovili, katera mineralna voda izmed 11 možnosti je bila njihov vzorec.

Mentorji smo se po dveh dneh preselili v Prago, kjer smo prevajali najprej praktične naloge, potem pa še teoretične. Vsako od obeh prevajanj traja ves dan, pri tem pa je treba biti zelo precizen, saj ne sme priti do napak. Dijaki imajo sicer možnost vpogleda tudi v angleško verzijo testa, vendar se počutijo mnogo bolj suverene, če lahko naloge prebirajo v svojem jeziku.

Praktični test pomeni 40% končnega rezultata, in teoretični 60%. Nasploh je bila ekipa letos v laboratoriju nekaj manj uspešna kot lani, vendar moram povedati, da so bile naloge časovno zahtevne, in prostor na pultu zelo omejen.

Preden smo začeli s prevajanjem teoretičnih nalog, smo si mentorji seveda ogledali Prago. To mesto kar kipi, saj v njem poleg turistov in domačinov srečate tudi veliko študentov, ki so prišli sem študirat. Obvezen je obisk Karlovega mostu, pa praškega gradu, ki je največje grajsko področje na svetu. Ponoči je lepo osvetljen, za kar gre zasluga rock ansamblu Rolling Stones, ki je pokril vse stroške zunanje razsvetljave na gradu. Tukaj je močno sled pustil tudi naš arhitekt Jože Plečnik, o čemer vam bodo Čehi pripovedovali z velikim spoštovanjem.

Na programu je bila tudi čudovita pot z ladjo po Vltavi, kjer se lahko navdušujete nad lepimi vedutami mesta. Obvezen je seveda obisk Švejkove pivnice. Čehi pridelajo (in popijejo) res veliko najrazličnejšega piva, in nekaj od tega smo izkusili tudi sami. Pivska zgodba je sploh zanimiva; pred stoletji je bila namreč poraba piva na osebo tudi desetkrat večja kot danes, saj je bila kvaliteta vode slaba. Pred težavskim delom so ljudje zjutraj pojedli kruh in toplo pivo; služabnikom na dvoru sta naprimer pripadala dva litra piva dnevno, poleg nekaj vina seveda. Navada je osta-

la, in tako je danes pivo tudi sestavina raznih jedi, od pivskih juh pa vse do slastnih omak in slaščic. Najbolj znana piva so Staropramen, pa Kozel, Budweiser iz mesta České Budějovice in tako naprej. Večino lahko danes dobite tudi v Sloveniji.

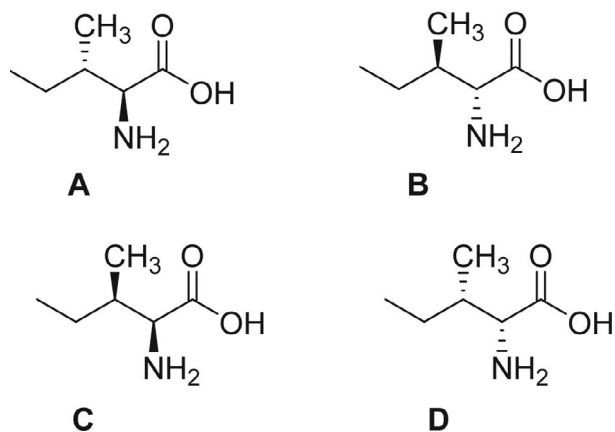
Mentorji smo obiskali tudi mesto Kutná Hora, zakladnico čeških kraljev, saj so bila tukaj bogata najdišča srebra. Mesto je bilo zato od trinajstega stoletja dalje eno najpomembnejših v državi. Impozantna je katedrala Sv. Barbare, posvečena zaščitnici rudarjev. V precej bizarni podzemni kapeli na mestnem pokopališču pa lahko vidite kosti več kot 40 000 ljudi, iz katerih so pri obnovah pred več kot sto leti naredili »dekoracije«, naprimer ogromni lestenec in vaze.

Vse to so organizatorji uporabili tudi pri teoretičnih nalogah na olimpijadi, ki jih bom opisal v nadaljevanju. Vse informacije v zvezi z olimpijado najdete na spletni strani organizatorja (<https://50icho.eu/>), in v naši spletni učilnici Kemljub, kjer so na voljo tudi druge vsebine (<https://skupnost.sio.si/course/view.php?id=150>).

Prva teoretična naloga je bila na temo DNK. Dijaki so morali analizirati termodinamiko nastanka dvojne vijajnice DNK iz posameznih verig ter njeno odvisnost od temperature. Izračunali so konstanto ravnotežja za asociacijo enojnih verig za nepalindromno in za palindromno DNK. Iz podatkov za spremembo proste entalpije asociacije in temperaturnih odvisnosti so izračunali še standardno spremembo entalpije ΔH° in standardno spremembo entropije ΔS° asociacije.

Druga naloga je bila na temo kosti vladarja Lotharja III, ki je umrl leta 1136 na poti iz juga Italije domov. Da bi med transportom ohranili truplo, so zgodovinarji predpostavili, da so njegovi vojaki truplo skuhalo; to hipotezo pa je bilo možno potrditi šele v dvajsetem stoletju z uporabo kemijske kinetike. Datiranje je osnovano na razmerju optičnih izomerov aminokislin. Po smrti se začne racemizacija L-aminokislin, dokler ne pride do ravnotežja med L- in D-obliko. Na ta način lahko določijo starost fosilov

ali kosti do 40 000 let. Pogoj je, da se temperatura ne spreminja dosti, vpliva pa seveda tudi vlaga. Nalogo so avtorji sestavili na primeru L-izoleucina, dijaki pa so morali najprej določiti konfiguracijo in iz termodinamskih podatkov izračunati prosto entalpijo vsakega stereoizomera.



Nato so naredili izračune koncentracij L- in D-oblike, ki sta prisotni po 1943 urah kuhanja pri 374K. Na koncu so iz podobnih podatkov za arginin izračunali še, da so morali truplo Lotharja III kuhati 6 ur.

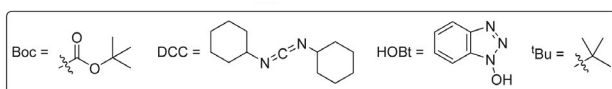
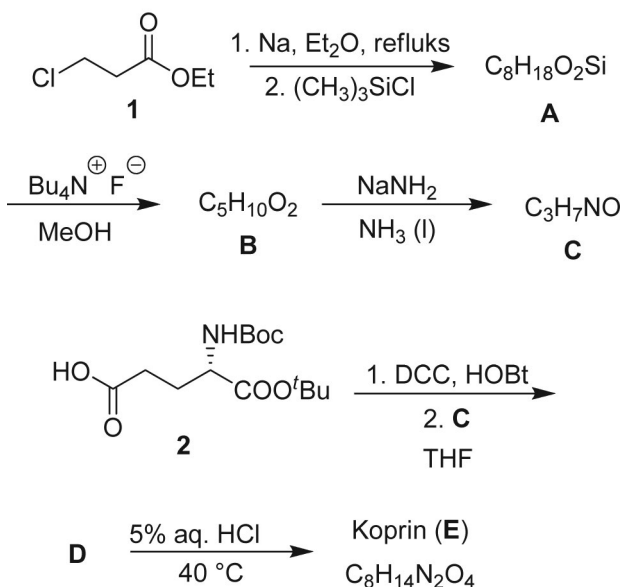
Tretja naloga je bila na temo elektromobilnosti. Gorivne celice predstavljajo način, kako povečati izkoristek motorjev v bodočnosti. To lahko dosežemo z gorivnimi celicami na osnovi vodika. Dijaki so morali najprej iz standardnih tvorbenih entalpij izračunati vrednosti specifičnih sežignih entalpij čistega tekočega izooctana in čistega plinastega vodika. Nato so s pomočjo entropij izračunali napetost vodikove gorivne celice, in njen termodinamski izkoristek. Alternativa tem so lahko gorivne celice na osnovi hidrazina (N_2H_4). Dopolniti so morali Latimerjev diagram z oblikami hidrazina in amonijaka, ki prevladujejo pri danih pogojih. Na koncu pa so za primerjavo izračunali še energijsko gostoto (v kWh kg^{-1}) modelne litij-ionske baterije.

Tema četrte naloge je bila pozitronska emisijska tomografija, ki se uporablja za diagnozo raka. Razen fluorovih in ogljikovih radioizotopov se v tej tehniki lahko uporablja tudi ^{64}Cu . Naloga 4 je obsegala pripravo tega izotopa iz ^{64}Zn , ki ga obstreljujejo z devterijem. Takšno aktivirano tarčo raztopimo v koncentrirani raztopini klorovodikove kisline (HCl (aq)), pri čemer nastane zmes, ki vsebuje Cu^{2+} in Zn^{2+} ione in njihove kloridne komplekse. Dijaki so morali s pomočjo konstante kompleksacije določiti deleža obeh. To zmes so nato ločili z anionskim izmenjevalcem. Z uporabo povprečnih masnih distribucijskih koeficientov D_g ($D_g(Cu \text{ delci}) = 17.4 \text{ cm}^3 \text{ g}^{-1}$, $D_g(Zn \text{ delci}) = 78.5 \text{ cm}^3 \text{ g}^{-1}$) so morali izračunati retencijski volumen V_R v cm^3 za bakrove in cinkove delce in ugotoviti, ali so se ločili.

Peta naloga je bila posvečena češkemu granatu (pirop), ki je cenjen poldrag kamen med izdelovalci nakita. Sestava češkega granata je $Mg_3Al_2(SiO_4)_3$, rdečo barvo tega

granata pa povzročajo primesi kroma. Granati imajo kuubično osnovno celico. Dijaki so morali iz podatkov za osnovno celico izračunati gostoto granata, ter narisati in ovrednotiti diagram razcepa d orbital. Razen tega so morali ugotoviti, kateri absorpcijski spekter je značilen za posamezen mineral izmed štirih možnosti: rdeč češki granat, zelen uvarovit, moder safir in rumeno-oranžen citrin. Na koncu pa so morali za sintetični granat YAG (itrijev aluminijev granat, $Y_3Al_5O_{12}$), ki se uporablja v optoelektroniki, ugotavljati strukturo, če je dopiran z ioni redkih zemelj, in ugotoviti, kakšna bi bila svetloba laserja, narejenega iz teh materialov.

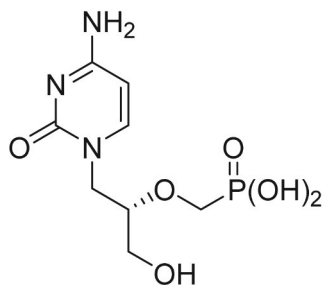
Šesta teoretična naloga je bila v zvezi z gobarjenjem, ki je tudi v teh državah zelo popularna aktivnost. Prava tintovka (*Coprinopsis atramentaria*) velja za užitno specialiteto. Vsebuje naravno snov koprin (E), ki ga lahko sintetiziramo iz etil 3-kloropropanoata (1) po shemi spodaj.



Dijaki so morali narisati formule spojin A–E in prikazati stereokemijo. V telesu koprin hidrolizira do L-glutaminske kisline in naprej do spojine, ki je odgovorna za škodljiv stranski učinek koprina, saj inhibira encim acetaldehid dehidrogenazo, ki sodeluje v presnovi alkohola. Po inhibiciji encima nastaja acetaldehid, ki se nabira v telesu in povzroči močne simptome podobne mačku (takoimenovani antabusni sindrom). Ta sindrom je dobil ime po antabusu, ki je najbolj znano zdravilo za zdravljenje odvisnosti od alkohola. Dijaki so morali dopolniti reakcijske sheme za omenjene reakcije. Na koncu pa so obravnavali še gobo pomladanski hrček (*Gyromitra esculenta*), ki je, čeprav je veljala za užitno, zaradi giromitrina strupena, in terja posebno pripravo. Dopolnili so reakcijske sheme za

sintezo te spojine, ter za njeno hidrolizo, ki se začne takoj, ko pride v stik s kislim okoljem želodca. Iz podatkov za nihanje vezi C-N so izračunali še kinetični izotopski efekt za hidrolizo pri telesni temperaturi.

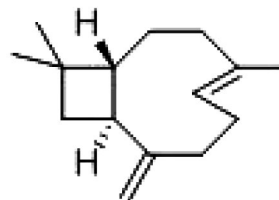
Sedma naloga je bila posvečena cidofovirju (1), ki ga je pripravil profesor Holý iz bivše Čehoslovaške. Gre za analog nukleotida s protivirusnim delovanjem, uporablja pa se za zdravljenje virusnih infekcij, predvsem pri pacientih, ki imajo AIDS. Več kot polovica pacientov, inficiranih z HIV ali hepatitisom B, se zdravi z zdravili, ki jih je razvil ta znanstvenik.



Cidofovir (1)

Dijaki so morali dopolniti reakcijsko shemo za sintezo te spojine, ki vključuje več vmesnih produktov, in vključiti povsod še stereokemijo.

Zadnja, osma naloga, je bila na temo β -kariofilena, ki se nahaja v klinčkih, baziliki, rožmarinu in kanabisu, najdemo pa ga tudi v nekaterih tradicionalnih čeških in slovaških rastlinah, kot sta hmelj ali lipovec.



V naravi ga vedno najdemo skupaj z izomerom. Dijaki so dopolnili reakcijsko shemo za sintezo β -kariofilena, ter proučevali različno reaktivnost dvojnih vezi v tej spojinu ter v izomeru.

Pri nalogah na olimpijadi sta najbolj zastopani fizikalna in organska kemija, skupaj skoraj 70%, zato je tudi na pripravah največ poudarka na teh dveh.

Naslednja mednarodna kemijska olimpijada bo v Parizu.

Vabljeni in vabljeni!

KOLENDAR VAŽNEJŠIH ZNANSTVENIH SREČANJ S PODROČJA KEMIJE IN KEMIJSKE TEHNOLOGIJE

SCIENTIFIC MEETINGS – CHEMISTRY AND CHEMICAL ENGINEERING

2018

October 2018

- 1 – 3 INTERNATIONAL SYMPOSIUM ON CATALYSIS AND SPECIALITY CHEMICALS IS CSC
2018
Tlemcen, Algeri
Information: <https://iscsc2018.univ-tlemcen.dz/>
- 3 – 5 10TH ECNP INTERNATIONAL CONFERENCE ON NANOSTRUCTURED POLYMERS
AND NANOCOMPOSITES
San Sebastian, Spain
Information: <http://www.rsc.org/events/detail/31234/10th-ecnp-international-conference-on-nanostructured-polymers-and-nanocomposites>
- 4 – 5 2ND SYMPOSIUM ON ORGANIC AND INORGANIC CHEMISTRY, SOUTHERN AFRICA
Gaborone, Botswana
Information: https://www.chalmers.se/en/conference/Organic_Inorganic_Chemistry
- 4 – 5 INTERNATIONAL SUSTAINABLE PRODUCTION AND CONSUMPTION CONFERENCE
Manchester, UK
Information: <http://www.icheme.org/ispcc>
- 7 – 10 SPICA 2018 – 17TH INTERNATIONAL SYMPOSIUM ON PREPARATIVE AND
INDUSTRIAL CHROMATOGRAPHY AND ALLIED TECHNIQUES
Darmstadt, Germany
Information: <https://www.spica2018.org/>
- 7 – 12 27TH EUCHEMS CONFERENCE ON MOLTEN SALTS AND IONIC LIQUIDS
(EUCHEMSIL2018)
Lisboa, Portugal
Information: <http://www.euchemsil2018.org/>
- 10 – 12 EAST-WEST CHEMISTRY CONFERENCE 2018 (EWCC2018)
Lviv, Ukraine
Information: <http://ewcc2018.org/>
- 14 – 17 4TH INTERNATIONAL CONFERENCE ON BIOINSPIRED AND BIOBASED CHEMISTRY
& MATERIALS
Nice, France
Information: <http://www.unice.fr/nice-conference/>
- 14 – 18 14TH IUPAC INTERNATIONAL CONGRESS OF PESTICIDE CHEMISTRY
Rio de Janeiro, Brazil
Information: <https://iupac.org/event/14th-iupac-international-congress-of-pesticide-chemistry/>
- 16 – 19 IBERO AMERICAN CHEMISTRY CONGRESS
Lima, Peru
Information: <http://sqperu.org.pe/congreso-2018/>

- 17 – 19 8TH INTERNATIONAL SYMPOSIUM ON DNA-ENCODED CHEMICAL LIBRARIES
Chengdu, China
Information: <http://www.dnaencodedlibrary.com/>
- 18 – 19 INTERNATIONAL WORKSHOP ON ENERGETIC MATERIALS
Istanbul, Turkey
Information: <http://iwem2018.istanbul.edu.tr>
- 19 – 20 13TH WORLD CONFERENCE ON APPLIED SCIENCE, ENGINEERING AND
TECHNOLOGY
Bangkok, Thailand
Information: <http://wcaset.co/index.php>
- 19 – 21 3RD INTERNATIONAL CONGRESS OF CHEMISTS AND CHEMICAL ENGINEERS OF
BOSNIA AND HERZEGOVINA
Sarajevo, Bosnia and Herzegovina
Information: <http://www.pmf.unsa.ba/hemija/kongres/index.php/en>
- 21 – 24 15TH INTERNATIONAL CONFERENCE ON MICROREACTION
TECHNOLOGY
Karlsruhe, Germany
Information: <http://dechema.de/en/IMRET2018.html>
- 24 – 25 IES2018 – 25TH SEMINAR AND SYMPOSIUM ON INFORMATION AND EXPERT
SYSTEMS IN THE PROCESS INDUSTRIES
Belgrade, Serbia
Information: <http://bg.ac.rs/en/members/faculties/FTM.php>
- 28 – 31 XXIX INTERAMERICAN CONGRESS OF CHEMICAL ENGINEERING
INCORPORATING THE 68TH CANADIAN CHEMICAL ENGINEERING
CONFERENCE
Toronto, Canada
Information: <http://www.csche2018.ca/>

November 2018

- 4 – 7 2018 – SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT
Rio de Janeiro, Brazil
Information: <https://www.flogen.org/sips2018/>
- 4 – 8 EMERGING POLYMER TECHNOLOGIES SUMMIT
Hanoi, Vietnam
Information: <http://emts18.org/index.html>
- 5 – 7 MicrobiotaMi 2018
Milano, Italy
Information: <https://microbiotami.com/>
- 5 – 9 XXIII INTERNATIONAL CONFERENCE ON CHEMICAL REACTORS
Ghent, Belgium
Information: http://conf.nsc.ru/CR_23/en/
- 7 – 9 14TH INTERNATIONAL CONFERENCE ON POLYSACCHARIDES-GLYCOSCIENCE
(14TH ICPG)
Praha, Czech Republic
Information: <http://www.polysaccharides.csch.cz/index.html>
- 11 – 17 FOURTH INTERNATIONAL CONFERENCE ON APPLICATION OF RADIOTRACERS
AND ENERGETIC BEAMS IN SCIENCES (ARCEBS-2018)
Kolkata, India
Information: <https://indico.cern.ch/event/674510/>
- 19 – 20 INTERNATIONAL CONFERENCE ON MOLECULAR BIOLOGY & STEM CELLS
Paris, France
Information: <http://molecularbiology.alliedacademies.com/>

20 – 22 2ND INTERNATIONAL CONFERENCE ON FUNCTIONAL MATERIALS AND CHEMICAL ENGINEERING(ICFMCE 2018)
Abu Dhabi,UAE, United Arab Emirates
Information: <http://www.icfmce.org/>

25 – 29 30TH INTERNATIONAL SYMPOSIUM ON THE CHEMISTRY OF NATURAL PRODUCTS AND THE 10TH INTERNATIONAL CONGRESS ON BIODIVERSITY
Athens, Greece
Information: <http://www.iscnp30-icob10.org/>

December 2018

19 – 20 THE INTERNATIONAL CONFERENCE ON ADVANCED AND APPLIED PETROLEUM, PETROCHEMICALS, AND POLYMERS (ICAPPP2018)
Bangkok, Thailand
Information: <http://www.icappp2018.com/>

2019

January 2019

18 – 20 2ND INTERNATIONAL JOINT CONFERENCE ON MATERIALS SCIENCE AND MECHANICAL ENGINEERING (CMSME 2019)
Phuket, Thailand
Information: <http://www.cmsme.net/>

29 IYPT2019 OPENING CEREMONY
Paris, France
Information: <http://www.iypt2019.org/>

February 2019

12 EMPOWERING WOMEN IN CHEMISTRY: A GLOBAL NETWORKING EVENT
Online
Information: <https://iupac.org/100/global-breakfast/>

21 – 24 3RD INTERNATIONAL CONFERENCE ON ENGINEERING PHYSICS AND OPTOELECTRONIC ENGINEERING (ICEPOE 2019)
Kuala Lumpur, Malaysia
Information: <http://www.icepoe.org/>

March 2019

11 – 13 2ND INTERNATIONAL CONFERENCE ON MATERIALS SCIENCE AND ENGINEERING (ICMSE-2)
Giza /Cairo , Egypt
Information: <https://icmse-egypt2019.org/>

11 – 15 6TH INTERNATIONAL CONFERENCE ON MULTIFUNCTIONAL, HYBRID AND NANOMATERIALS
Sitges, Spain
Information: <https://www.elsevier.com/events/conferences/international-conference-on-multifunctional-hybrid-and-nanomaterials>

24 – 28 1ST GHI WORLD CONGRESS ON FOOD SAFETY AND SECURITY (GHI2019)
Leiden, The Netherlands
Information: <https://ghiworlworldcongress.org/>

31 – Apr. 4 AIChE SPRING MEETING 2019 AND 15TH GLOBAL CONGRESS ON PROCESS SAFETY
New Orleans, USA
Information: <https://www.aiche.org/conferences/aiche-spring-meeting-and-global-congress-on-process-safety/2019>

April 2019

9 – 12 26TH CROATIAN MEETING OF CHEMISTS AND CHEMICAL ENGINEERS (26HSKIKI)
Šibenik, Croatia
Information: <http://www.26hskiki.org/en/>

May 2019

19 – 24 14TH IUPAC INTERNATIONAL CONGRESS OF CROP PROTECTION CHEMISTRY
Ghent, Belgium
Information: <https://www.iupac2019.be>

June 2019

2 – 6 14TH INTERNATIONAL SYMPOSIUM ON MACROCYCLIC AND SUPRAMOLECULAR
CHEMISTRY
Lecce, Italy
Information: <https://ismsc2019.eu/>

11 – 13 23RD GREEN CHEMISTRY & ENGINEERING CONFERENCE AND 9TH INTERNATIONAL
CONFERENCE ON GREEN AND SUSTAINABLE CHEMISTRY
Reston, Virginia, United States
Information: <http://www.gcande.org/>

16 – 19 9TH INTERNATIONAL COLLOIDS CONFERENCE
Sitges, Spain
Information: <https://www.elsevier.com/events/conferences/international-colloids-conference>

16 – 19 LOSS PREVENTION 2019
Delft, The Netherlands
Information: <http://lossprevention2019.org/>

16 – 20 17TH INTERNATIONAL CONFERENCE ON CHEMISTRY AND THE ENVIRONMENT
– ICCE2019
Thessaloniki, Greece
Information: <http://www.euchems.eu/events/17th-international-conference-chemistry-environment-icce2019/>

16 – 20 12TH IWA INTERNATIONAL CONFERENCE ON WATER RECLAMATION AND REUSE
Berlin, Germany
Information: <http://efce.info/IWA+Conference+2019.html>

26 – 28 THERMODYNAMICS 2019
Huelva, Spain
Information: <http://efce.info/Thermodynamics+2019.html>

26 – 30 6TH EUROPEAN CONFERENCE ON ENVIRONMENTAL APPLICATIONS OF
ADVANCED OXIDATION PROCESSES (EAAOP-6)
Portorož, Slovenia
Information: <http://eaaop6.ki.si/>

July 2019

1 – 3 CONGRESS ON NUMERICAL METHODS IN ENGINEERING
Guimarães, Portugal
Information: www.cmn2019.pt

5 – 12 IUPAC 2019 PARIS FRANCE
Paris, France
Information: <https://www.iupac2019.org/>

21 – 26 THE 18TH INTERNATIONAL SYMPOSIUM ON NOVEL AROMATIC COMPOUNDS
(ISNA-18)
Sapporo City, Japan
Information: <https://iupac.org/event/18th-international-symposium-novel-aromatic-compounds-isna-18/>

- 26 – 28 MENDELEEV 150: 4TH INTERNATIONAL CONFERENCE ON THE PERIODIC TABLE
ENDORSED BY IUPAC
Saint Petersburg, Russian Federation
Information: <http://mendeleev150.ifmo.ru/>
- 30 – Aug. 1 8TH INTERNATIONAL CONFERENCE FOR NETWORK FOR INTER-ASIAN CHEMISTRY
EDUCATORS (NICE)
Taipei, Taiwan
Information: <https://iupac.org/event/8th-international-conference-network-inter-asian-chemistry-educators/>

August 2019

- 4 – 8 36TH INTERNATIONAL CONFERENCE OF SOLUTION CHEMISTRY
Xining China
Information: <http://icsc2019.csp.escience.cn/>
- 25 – 30 6TH INTERNATIONAL CONFERENCE ON THE CHEMISTRY AND PHYSICS OF THE
TRANSACTINIDE ELEMENTS (TAN 19)
Wilhelmshaven, Germany
Information: <https://www-win.gsi.de/tan19/>

September 2019

- 1 – 5 EFMC-ASMC'19 – EFMC INTERNATIONAL SYMPOSIUM ON ADVANCES IN
SYNTHETIC AND MEDICINAL CHEMISTRY
Athens, Greece
Information: <https://www.efmc-asmc.org/>
- 2 – 6 1ST INTERNATIONAL CONFERENCE ON NONCOVALENT INTERACTIONS (ICNI)
Lisbon, Portugal
Information: <http://icni2019.eventos.chemistry.pt/>
- 8 – 13 INTERNATIONAL SYMPOSIUM ON IONIC POLYMERIZATION – IP '19
Beijing, China
Information: <https://iupac.org/event/international-symposium-on-ionic-polymerization-ip-19/>
- 15 – 19 11TH EUROPEAN CONGRESS OF CHEMICAL ENGINEERING – ECCE11 &
4TH EUROPEAN CONGRESS OF APPLIED BIOTECHNOLOGY – ECAB5
Florence, Italy
Information: http://efce.info/ECCE12_ECAB5-p-112545.html
- 25 – 27 SLOVENIAN CHEMICAL SOCIETY ANNUAL MEETING 2019
Maribor, Slovenia
Information: <http://chem-soc.si/slovenski-kemijski-dnevi-2019>

2020**July 2020**

- 5 – 9 48TH WORLD POLYMER CONGRESS – MACRO2020
Jeju Island, Korea
Information: <http://www.macro2020.org/>

August 2020

- 16 – 21 12TH TRIENNIAL CONGRESS OF THE WORLD ASSOCIATION OF THEORETICAL AND
COMPUTATIONAL CHEMISTS
Vancouver, Canada
Information: <http://watoc2020.ca/>
- 30 – Sept. 3 ECC8 – 8TH EuChemS CHEMISTRY CONGRESS
Lisbon, Portugal
Information: <http://www.euchems.eu/events/ecc8-8th-euchems-chemistry-congress/>

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 filed.

Step 4: Upload supplementary files

- Original Word file (original of the PDF uploaded in the step 2)
- **Statement of novelty** in a Word file must be uploaded
- 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 most recent activity of the author and his/her research group 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 directions for article structure in ACSi below): (1) an introduction that acquaints readers with the authors' research field and outlines the important questions to which answers are being sought; (2) interesting, new, and recent contributions of the author(s) to the field; and (3) a summary that presents possible future directions. Manuscripts normally should not exceed 40 pages of one column format (letter size 12, 33 lines per page). Generally, experts in a field who have made important contribution to a specific topic in recent years will be invited by an editor to contribute such an **Invited Feature Article**. Individuals may, however, send a proposal (one-page maximum) for an Invited 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. Collela, 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. Cszimadia, Prediction of dissociation 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 involved 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 three 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 preferably countries other than) those of any of the authors.

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 three potential referees from institutions other than (and preferably countries other than) those of any of the authors are prepared in the word file. At least two relevant references (important papers with high impact factor, head positions of departments, labs, research groups, etc.) for each suggested reviewer must be provided.
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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<http://www.ewa-online.eu/>



European Science Foundation

www.esf.org



European Federation of Chemical Engineering

<https://efce.info/>



I U P A C

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PURE AND APPLIED CHEMISTRY

International Union of Pure and Applied Chemistry

<https://iupac.org/>

Novice evropske zveze kemijskih društev (EuCheMS) najdete na:



EuCheMS: Brussels News Updates

<http://www.euchems.eu/newsletters/>



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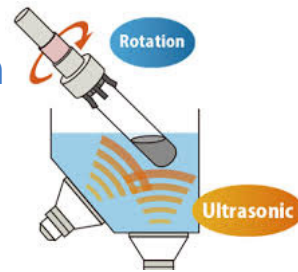
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NOVO

 KRKA

Acta Chimica Slovenica

Aurivillius phase $\text{Bi}_2\text{Ti}_3\text{O}_{12}$ plates, grown in the molten salt, represent an appropriate template for the synthesis of SrTiO_3 plates through topochemical conversion, which is a unique approach to the preparation of asymmetrically shaped particles of perovskites with a symmetrical crystal structure. (see page 630)



Year 2018, Vol. 65, No. 3

