

TWENTY-SECOND ANNUAL CONFERENCE

YUCOMAT 2021

Program

and

Book of Abstracts

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TWENTY-SECOND ANNUAL CONFERENCE

YUCOMAT 2021

Hunguest Hotel Sun Resort, Herceg Novi, Montenegro

August 30 - September 3, 2021

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WELCOME SPEECH BY THE PRESIDENT OF MRS-SERBIA

Dear Attendees,



It is my great pleasure to greet you on behalf of the Conference hosts and wish you a solid program, lots of happiness and good health, which we all need in these times. Not a single prior YUCOMAT Conference has been organized with as much uncertainties as this one. Some remember the Third YUCOMAT Conference held right after the NATO bombing of Serbia and Montenegro, which lasted from the end of March 1999 until mid-June that same year. That Conference was held with a single foreign participant – Giovanni Battiston, CNRS, Padua, Italy, who said back then, “I promised that I would come and now I am here”. Last year was the first one to have a YUCOMAT Conference cancelled, not long before it was scheduled to be held,

after it was clear that the risk for the participants would be too large.

As we reached the 100th submission during June and July this year, we decided that the Conference should be organized, hoping that the positive epidemiological situation would continue throughout the summer and that all of us would do it all to respect the measures in place. A number of plenary lecturers had to cancel their lectures and postpone them for the next year (YUCOMAT, August 29 – September 2, 2022), considering the travel limitations in many countries. There are still around 10 plenary lecturers in the Program, some of whom would talk here and some of whom sent their presentations, which are posted on the MRS webpage. Out of 100 authors who will present their research orally and via posters, the majority are from Serbia, around 30 %, followed by participants from Poland, Czech Republic, Slovenia and Russia, accounting for about 40 % in total, whereas no other country has more than 3-4 participants. The coronavirus has done its fair share and as a result we have a very different structure compared to earlier years, when the predominant participants were from USA, Korea, Taiwan and the Far East.

After five winners of the Big Award of our Society for the lasting and outstanding contribution to materials science who originated from the region of former Yugoslavia, the last year's winner was Robert Sinclair, Charles M. Piggot Professor in the School of Engineering at Stanford and the first the win this award after its internationalization and opening to all our members. Robert Sinclair gave a significant contribution to our field and our Society as a long-term President of the International Advisory Board and a participant at all recent YUCOMAT Conferences. Since the last year's Conference was not held and was postponed and since Bob could not attend this year's conference, he sent his talk and the certificate and the medal will be given to him next year. This year's winner of the Award is Prof. Yuri Gogotsi, director of the Drexel Nanotechnology Institute, for his contribution to the field of nonoxide materials with a special emphasis on MAXene family of 2D metal carbides and carbonitrides and a long-term successful cooperation with our country through MRS-Serbia and the International Institute for the Science of Sintering. The decision for both winners is found in the Program and the Book of Abstracts.

One of the very important activities of our Society since its beginning was the recognition of the young researchers as Conference participants. As of this year, MRS – Singapore as one of the most active MRS in the world and the one which will be the headquarters of the International Union of MRS (IUMRS) has joined us in the financial segment of this award. Tuesday will be dedicated to this activity and 20 young people will compete for the best oral presentation, whereas in the afternoon 20 of them will compete for the best poster presentation. In both cases we will select 5 best presenters and their names will be announced on Friday at the Conference Closing, whereas the certificates and the financial rewards will be handed to them at the opening of the first following Conference.

This is Tenth YUCOMAT Conference to be held in this Hunguest Sun Resort Hotel. At this very same location, which used to be the Nuclear Center belonging to the Nuclear Commission of former Yugoslavia, starting from 1969, the World Round Table Conferences of Sintering were held, where, just like today, world-renowned scientists from both West and East used to congregate. In the Iron Curtain era, in fact, it was the only place where they could meet. This part of Herceg-Novi is called Topla and some of the most intellectual people from this region have occasioned it. Our famous poet and statesman, Petar II Petrović Njegoš, for example, was educated in a little house near the Church of Saint George, not far from here, whereas directly on the opposite side our Nobel Laureate in literature, Ivo Andric, used to live and work. Our hosts at the Hunguest Hotel maintain the memory of those people and those times by helping us organize these conferences. There is a lot of examples of their highly positive attitude toward this meeting, including the traditional cocktail party they organize on Monday evening, which is always memorable. I hope that this Conference will also go well and will be worth remembering and that we will all happily and healthily return to our homes from it.

Sincerely Yours,
Dragan Uskoković

P.S.I.2.

Mercerized jute fabrics suitable for technical textiles

Aleksandra Ivanovska¹, Koveljka Asanovic², Maja Jankoska³, Mirjana Kostic ²

¹University of Belgrade, Innovation Center of the Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Serbia, ²University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Serbia

³Ss. Cyril and Methodius University in Skopje, Faculty of Technology and Metallurgy, Ruger Boskovic 16, 1000 Skopje, North Macedonia

Simple chemical modifications by using 17.5 % NaOH (for 5, 15, or 30 min) were applied to obtain jute fabrics suitable for various types of technical textiles such as carpet backing and advanced protective textiles, *i.e.*, protective clothing in environments sensitive to electrical discharges. The raw, as well as mercerized jute fabrics, were characterized in terms of their chemical composition (cellulose and hemicellulose content), structural characteristics (fabric weight, thickness, and porosity), and fibers' surface morphology (determined by FESEM). In order to assess their ability for utilization as technical textiles, the compression properties (compressibility and compression resilience), abrasion resistance (by determining mass loss after 750 and 1000 cycles), and volume electrical resistivity were studied. The obtained results revealed that with prolonging the mercerization duration from 5 up to 30 min, the hemicellulose content decreased, fabrics' compactness increases contributing to decreased compressibility and increased compression resilience. Concerning the abrasion resistance, a mass loss of about 19 % was observed after 750 cycles in the case of raw jute fabric, while the mercerized jute fabrics possessed up to 7.6 % mass loss even after 1000 cycles. Such behaviour could be ascribed to the higher friction force between the yarns within the mercerized fabrics and between the fibres within the yarns enabling less loss of fibres from the fabric surface. Mercerization for 5 min leads to a decrease, while those performed for 30 min resulted in an increased volume electrical resistivity.

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