

Joint 74th ICCP and 39th TSOP Meeting 17th – 24th September 2023, Greece

Conference & Cultural Center of the University of Patras, Rio-Patras, Greece



photo from http://www.confer.upatras.gr/indexen.php

Theme of the Meeting Organic Petrology in the Energy Transition Era: Challenges ahead

Joint 74th ICCP and 39th TSOP Meeting 17th – 24th September 2023

Greece hosted previously twice the ICCP family in the meetings of 1993 in Chania, Crete, and 2005 in Patras. However, our world has changed significantly in the last decade, and we are nowadays moving within "uncharted waters" facing challenges that also affect our scientific discipline.

Within this context the Organizing Committee is pleased hosting for the first time in Greece a joint Meeting of **The Society** of Organic Petrology (TSOP) and the International Committee for Coal and Organic Petrology (ICCP). The Organizers anticipate providing a unique forum for members of both Organizations and for not-yet members to interact in a week-long meeting to discuss and exchange ideas, and thus contribute to the future of Organic Petrology.

The Meeting is organized by the Department of Geology, University of Patras, in the Conference & Cultural Center of the University of Patras, in Rio, a suburb of Patras, Western Greece, in the week 17-24 of September 2023. The period is very favorable, as it is just after the high holiday season, with still marvelous weather.

Therefore, we look forward to welcoming you in Patras for a fruitful meeting and enjoyable field trips across the Ionian Islands and Western Greece.

More information regarding registration and important dates will follow soon. Stay tuned!

For the Organizing Committee

Kimon Christanis, Chair

Stavros Kalaitzidis, Executive Secretary

For any queries please contact: skalait@upatras.gr

	Sunday - Joint	ICCP-TSOP day	M	onday	Tu	esday	Wednesday	Thursday	Friday	Saturday	Sunday
	17/9/	2023	18/	9/2023	19/	9/2023	20/9/2023	21/9/2023	22/9/2022	23/9/2023	24/9/2023
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10:00					ICCP Session	TSOP Technical Session	nes	Joint ICCP-TSOP Symposium	ICCP Session	sla	
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17:30			ICCP Session	TSOP Short Course	ICCP Session	TSOP Technical Session	ju	Joint ICCP-TSOP Symposium	ICCP Closing Plenary	<u>2</u>	
18:00									Session	<u>i</u>	
18:30	Registration				loint ICCP-TS	PP Poster Session	Σ	TSOP Closing Ceremony		q	
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19:30							<u>г</u> -д				
20:00					ICCP Council	Student Event	22				
20:30	Ioint ICCP-TSC	P Ice Breaker			icei eounai	Student Event					
21:00	na	rty				ļ	ļ				
21:30	pa	,					Joint Conference Dinner				
22:00											
22:30											

The Society for Organic Petrology

TSOP is a society for scientists and engineers involved in coal petrology, kerogen petrology, organic geochemistry, and related disciplines. The Society organizes an annual technical meeting and field trips; sponsors research projects; provides funding for graduate students, and publishes a website, Facebook Page, quarterly newsletter, annual meeting program and abstracts and special publications. Members are eligible for discounted subscriptions to Elsevier journals *International Journal of Coal Geology* and *Review of Palaeobotany and Palynology*.

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GUIDELINES:

The TSOP Newsletter welcomes contributions from members and non-members alike. Readers are invited to submit items pertinent to TSOP members' fields of study. These might include meeting reports and reviews, book reviews, short technical contributions including those on geologic localities or laboratory methods, as well as creative works such as poems, cartoons and works of fiction. Photos, graphs and other illustrations are welcomed. Low-resolution images are discouraged, as they cannot be reproduced well in print. Articles are preferred in Microsoft Word, RTF or plain text formats.

Contact the Editor:

Fu Biao: editor@tsop.org

Membership Information:

Please report any changes in address or contact information to Brett Valentine, TSOP Membership Chair: <u>bvalentine@usgs.gov</u>

Members can also update their own information by logging into the secure TSOP website: <u>www.tsop.org/mbrsonly/</u>

The TSOP Newsletter is published quarterly by The Society for Organic Petrology and is distributed to all Society members as a benefit of membership.

Membership in the Society is open to all individuals involved in the fields of organic petrology and organic geochemistry. For more information on membership and Society activities, please see: www.tsop.org

For purposes of registration of the TSOP Newsletter, a permanent address is: The Society for Organic Petrology c/o American Geological Institute 4220 King St., Alexandria, VA 22302-1520 USA

Newsletter Submission Deadlines

December Issue: Dec. 10th, 2022 March Issue: March 10th, 2023 June Issue: June 10th, 2023 September Issue: Sept. 10th, 2023

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Dear TSOP Members,

The time to say goodbye to another year always comes around too fast for me, but it is an opportunity to reflect on the good, the bad, the ugly (for which nothing comes to mind) and the future.

From TSOP's perspective the good outweighs the rest for 2022. We concluded a fantastic, first-ever virtual annual meeting, which also included another TSOP first in the form of a roundtable discussion during the meeting. The meeting highlighted the team spirit and keen interest in advancing the science that exists within our community. TSOP Council has settled in well with the new editor and councillor making valued contributions to the team. Council is working on several initiatives to address a progressive decline in our membership (the bad) through student and Castano award recipient seminars throughout the year, and an anticipated revision of the society's objectives.

In this newsletter we make some special and rare announcements. TSOP Council would like to recognise the continued efforts and extensive service of our outgoing editor, Rachel Walker, through awarding Rachel the Lifetime Membership Award (LMA). Similarly, we wish to present the LMA to Sharon Swanson, our outgoing Incorporation Committee Chair, for her various contributions to the society over many years. Very few LMAs have been presented in TSOP's history, so I would like to congratulate Rachel and Sharon on this great achievement and the fully deserved recognition that is associated with the award.

We also wish to express our sincere thanks to Isabel Suarez-Ruiz, our outgoing Research Committee Chair, for her diligence in developing and supporting research projects that receive TSOP funding. We have no doubt that our new Research Committee Chair, Jim Hower, will continue this great work.

Over the coming weeks the website for the Joint 74th ICCP and 39th TSOP Meeting will be going live, and I urge you review the program being prepared by Stavros Kalaitzidis and the organising committee. The meeting will be held in Patras, Greece, between the 17th and 24th September 2023, and promises to be an intellectually stimulating and enjoyable event for meeting attendees and their companions.

On a personal level my year has been quite eventful. I managed to visit my family in South Africa after no visits four years. In addition, I (finally) completed a Bachelor of Education degree which feels like it's taken forever, but, don't worry, I have no intentions of becoming a high school science teacher just yet. The skills and knowledge acquired in the process have been useful in many other ways though. I have settled into my role at the NSW Department of Planning and Environment, and feeling like I've been "thrown into the deep end" is a bit of an understatement, but I've convinced myself that avoiding a mental (and physical) comfort zone keeps the aging process at bay.

My family and I would like to wish you and your loved ones a wonderful Christmas and an exciting start to 2023. I look forward to further work on our initiatives and to securing TSOP future as a vibrant and growing professional society.

As for some personal news, by now many of you would be aware that I have taken up a new role with

the New South Wales Government as a Senior Scientist in the Department of Planning and Environment. The team I am part of focusses on modelling emissions projections across all IPCC reporting sectors and is closely involved in tracking progress for the government's Net Zero Plan for the state. It is certainly an interesting time to be a geoscientist and I wish to close with something I firmly believe as we navigate the anticipated changes in our profession: Opportunity awaits!

Best wishes, Kaydy Pinetown, TSOP President 2021-2023

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TSOP Membership Dues

TSOP dues payments are due on or before **December 31st each year.** We encourage you to check your dues status and make your payment so that you can continue your TSOP membership and support the society and its work.

TSOP dues are currently set at:

Individuals:

- \$25 per year or
- \$100 for 5 years (5 years for the price of 4!)

Students:

• \$15 per year

Institutional/Corporate:

• \$75 per year



You can use our convenient online dues payment system to pay dues by credit card. You can login at the <u>Members Only TSOP</u> website and select 'Online dues payment' or go to <u>www.tsop.org/dues</u> and access the online form without logging in.

Thank you for your interest and support of TSOP and we look forward to a renewal of your TSOP membership.

TSOP is an AAPG Affiliated Society. Abstracts from annual meetings are available through <u>AAPG Datapages</u>



www.facebook.com/OrganicPetrology

Join TSOP's growing community of professionals, researchers, and students on LinkedIn: <u>https://www.linkedin.com/groups/12634595/</u>

Thank you for continued service to TSOP – Isabel Suarez-Ruiz

- Retiring Research Committee Chair

On behalf of the society, it is a pleasure to express a special thanks to Isabel Suarez-Ruiz for her continued service and unwavering support. Isabel has made significant contributions to TSOP and to science, as evidenced in being a John Castaño Honorary Membership Award recipient in 2021. Recently Isabel has served as Chair of the Research Committee for several years and has keenly supported and developed research projects in organic petrology and related disciplines. Beyond her recent roles, Isabel is also a past TSOP President and has presented her research and numerous TSOP and ICCP meetings. We trust that she will remain active within the OP community in the future.

TSOP Lifetime Membership Award

TSOP's Lifetime Membership Award, designed for honouring members, council members, and committee members who have contributed to the society in a substantial way over a long period of time, is only presented on very special occasions. We are thus pleased to announce the presentation of the Lifetime Membership Award to the following recipients:

Rachel Walker – TSOP Editor (2006-2022)

TSOP Council and our membership would like to recognize the continued service of our outgoing Editor, Rachel Walker. Rachel has been a TSOP member for many years and has diligently fulfilled the role of editor for more than 16 years. Beyond the role of editor, she has supported TSOP through several committee chair roles and through her active participation and involvement at annual meetings. Her professionalism, strong work ethic, and enthusiasm will be missed. We look forward to future interactions with Rachel and wish her all the best in her work and personal life.

Sharon Swanson – Incorporation Committee Chair (2008-2022)

We would like to commend Sharon Swanson for her continued support and service to TSOP over the past 15 years. Sharon served as Councilor from 2007-2009 during which she became involved in efforts to get the society incorporated as a non-profit organization. Since then, she has served as the Incorporation Committee Chair, which is a critical role in securing TSOP's legal standing and meeting all tax-exempt requirements. In addition, Sharon has supported TSOP through in-person attendance and presentation of her research at several annual meetings, has contributed to several society initiatives, and has shared with TSOP's geoscience community her warmth, wisdom, and expertise that we trust will be part of the TSOP family for a long time to come.

First Draft: Why bother to join professional societies

Jim Hower, University of Kentucky Center for Applied Energy Research

Long ago, long before the internet and pdf version of manuscripts, one of my professors passed along his impressions on why to join a professional society. Of course, as a student, the thought of being a student member of the Geological Society of America or the American Association of Petroleum Geologists meant, perhaps above anything else, the prospect of getting their monthly journal, studying the abstracts from the national and regional meetings, buying books at a discount, and the prospect of attending an annual meeting in Seattle or Toronto or some other distant destination. Now, the print journals and books are too expensive for student, and some professional, budgets and, besides, the papers can be accessed through many university libraries.

So, why bother to join the society if the content is readily available? Well, more than the access to the journals, his point was that being part of a professional society is part of your credentials as a professional in the discipline. The Society for Organic Petrology (and, for some of you, ICCOP) is our guild, our aggregation of collective experience in our chosen discipline. Being a member is a statement that you belong in the profession and, along with the other 182 (as of 21 November 2022) members, you consider yourself an organic petrologist.

More than just the pride of membership, being part of the society gives you the opportunity to shape the present and future of the profession. This mean not just participating in the annual meeting, either inperson or remotely, but also writing papers outside of the confines of TSOP's special issue of International Journal of Coal Geology, organizing TSOP- sponsored petrology and geochemistry sessions at other regional and national meetings, contributing to this newsletter, serving on TSOP committees, mentoring young members, and much more. More than just for the society, all of this is how our profession survives and thrives.



Leaves of Bee Balm

Macerals in Bee Balm (*Monarda bradburiana*). Cutinite (c) with trichomes (t), funginite (fg), and chlorophyllinite (cp) are visible in this image.

John Castaño Honorary Membership Award, Call for nominations, 2023 Deadline: May 31, 2023

TSOP members are invited to nominate the scientist of your choice for the 2023 John Castaño Honorary Membership Award, The Society for Organic Petrology's highest honor (https://www.tsop.org/Castano_award.html). The award acknowledges distinction in a scientific discipline of significance to the society, in recognition of contributions in research, service to TSOP, or education. The John Castaño Honorary Membership conveys life membership in the society. It is named in honor of John Castaño, one of our most active Houston-based founding members. John served as inaugural Vice-President, and later, as President of TSOP. He was an organizer of three TSOP meetings in the Houston area, and was made an Honorary Member in 1995. John served TSOP in many capacities until his death in 1997; a memorial article was published in the June 1997 issue of the TSOP Newsletter.

If you would like to suggest a candidate for the 2023 John Castaño Honorary Membership Award, please submit a letter of recommendation and a brief vita of the nominee to: Dr. Lei Zhao at **lei.zhao@y7mail.com**, Chair of the Committee by May 31, 2023.

It is suggested that supporting letters of recommendation from colleagues and other scientists accompany the package. Emphasis should be placed on the significance of the nominee's work.

Nominations will be reviewed by the John Castaño Award Committee and results will be announced at the Annual Meeting. The selection process is confidential and nominees do not have to be former or current TSOP members.

The committee evaluates research, service and educational impact on the following criteria:

- Research contributions include work that demonstrates a high degree of originality and serves to advance the science of
 organic petrology or related disciplines. Nominees must possess a sustained international record of professional
 publication and achievement.
- Nominees recommended for service must demonstrate significance contributions to TSOP in a leadership role. Their service must have enabled the society to stimulate interest and promote innovative research in coal geology. Contributions include educational activities, administrative duties, or the development of the society.
- Nominees recommended for education must demonstrate a high degree of dedication and significant impact as a teacher of organic petrology or related disciplines.

Dr. Lei Zhao

TSOP Vice President and Chair of the Honorary Member Selection Committee

Reports on 38th TSOP Annual Conference - 12 to 16 September 2022



Figure 1: Logo for the Virtual online TSOP Annual Meeting.

This year's annual conference for The Society for Organic Petrology was held exclusively online for the second year in a row. Its theme "**Organics in the Geological Cycle**" strived to encompass all forms of organics and all the ways we use them to look into our geological past.

Despite the challenges of an online meeting, all talks went smoothly and we had a fantastic turn out. The CSIRO (Australia) kindly provided the platform (WebEx) for the whole conference and there was not a single glitch! Dr Agnieszka Drobniak did all the website work for this conference and her contribution is hugely noted, appreciated and thanked a thousand times over!

In face-to-face meetings, TSOP usually has technical talks held over two days for 8 hrs. each; in order to accommodate differences in time zones, however, we choose to only run each day for 4 hrs. but have three days of technical talks.

There were over 60 abstracts presented, 12 of which were ePosters. To accommodate all the oral talks, two streams were conducted simultaneously. We were very fortunate to start the first two days with Keynote talks from two internationally renowned researchers. The first day was Dr Linda Stalker (CSIRO, Australia) whose talk was titled "Geoscience for the future: There is a future right?" The second day's Keynote was Dr Deb Willard (USGS, USA) who presented: "Broadening the perspectives of organic petrology: Implications of analysis of sedimentary organic matter for evolving questions".

On the third day we held a 70-minute Roundtable discussion on *The Role of Fossil Fuels in a Net Zero Emissions Energy Sector,* which was chaired by Prof Hamed Sanei. This was something new for a TSOP conference and included panelists from around the world:

- o Ms Carolina Gutiérrez Hernadez (Director of Sustainability, Colombian Mining Association, Colombia)
- Prof David Rutledge (California Institute of Technology, USA)
- Mr Mike Teke (CEO, Seriti Resources Holdings, South Africa)
- o Mr John Kessels (Consultant, Circular Economy and Climate Change, UK)
- o Dr Dietmar Tourbier (CSIRO, Australia)

The technical talks ranged from assessment of critical elements to carbon isotopes in palaeoclimate studies; from evaluation of lead contamination at mine sites to organics in shales. Speakers came from 16 countries: Argentina, Australia, Brazil, China, Colombia, Denmark, Germany, India, Indonesia, Mongolia, Poland, Portugal, South Africa, Spain, United Kingdom and the USA. It truly was a global meeting of minds.

Following in the tradition of past TSOP conferences, an online two-day pre-meeting workshop was also offered. U.S. Geological Survey researchers Paul Hackley, Aaron Jubb, Brett Valentine, Ryan McAleer and Justin Birdwell presented an outstanding workshop titled '*Spatially resolved techniques and applications of organic petrography in shale petroleum systems'*. Over 100 participants from around the world registered with usually about 50-60 online at any particular time. The presentations given surely set new high standards for online workshops.

Students are the lifeblood of any professional organizations and we had over 14 student presentations. They were all

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excellent and are to be commended. As is the usual case TSOP awards a best Oral and best Poster presentation and this year these went to Morgana Carvalho of the University of Porto, Portugal, for her poster presentation on ANALYSIS OF CHARCOAL FRAGMENTS FROM A WILDFIRE IN PORTUGAL: A PRELIMINARY PETROGRAPHIC CHARACTERIZATION and Rafaela L. Lenz of the Federal University of Rio Grande do Sul, Brazil, for her oral presentation on EFFECTS OF IGNEOUS INTRUSIONS ON THE BIOMARKER DISTRIBUTION PRESENT IN THE BITUMINOUS SHALES OF IRATI FORMATION, PARANÁ BASIN – BRAZIL



Figure 2: Screen shot of Day 3 Roundtable discussion.

Like most organizations we rely on sponsorship to help fund awards, hosting costs and other incidentals. This year the University of Johannesburg (South Africa) provided a large donation and we are especially grateful for that and also to TSOP member Dr Ofentse Moroeng for making that happen. We also are hugely grateful to the U.S. Geological Survey (USA) who also made a sizable donation. Also Cipher Consulting Pty Ltd (Brisbane, Australia) made a significant contribution of funds and finally we wish to thank Dr Xingjin Wang (Sydney, Australia) who made a spectacular personal donation.



Figure 3: Even Santa the Dog (Brisbane) is keeping up on what is happening at the 38th Annual meeting of The Society for Organic Petrology.

Finally, no TSOP conference can happen without the hard work of the Organizing Committee. Please let us all acknowledge the hard work of the following people:

D Hendra Amijaya Andreas Busch	Gadjah Mada University, Indonesia Heriot-Watt University, United Kingdom
Shifeng Dai Paul Hackely	China University of Mining and Technology, China
Faulflackely	0 5 Geological Survey, 0.5.A.

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Carme Huguet	Universidad de los Andes, Colombia
Grzegorz Liz	Instytute Nauk Geologicznych, Poland
Ofentse M Moroeng	University of Johannesburg, South Africa
Jill Pearse	Universidad de los Andes, Colombia
Kaydy Pinetown	CSIRO, Australia
Sandra Rodrigues	University of Queensland, Australia
Leslie F Ruppert	U S Geological Survey, U.S.A.
Hamed Sanei	Aarhus University, Denmark
Carol I Sule	Woodside Energy, Australia
Pelayo Tomillo Garcia	Inst. de Ciencia y Tecnologia del Carbono, Spain
Alex Wheeler	Leibniz University, Germany
Tianjiao Yu	Queensland University of Technology, Australia

In the year and a quarter we had to plan, we had 12 meetings; since we had people from all around the world on the committee some of these times were not always convenient to all. Thus, on behalf of our society I'd like to thank each one of the Organising Committee for their exceptionally hard work; it was their commitment that made the 38th Annual Meeting of The Society for Organic Petrology such a huge success.

Tim A Moore Convener, 38th Annual TSOP Conference

Renaming of the Distinguished Service Award: John C. Crelling Distinguished Service Award



The TSOP Distinguished Service Award has been renamed in honor of John C. "Jack" Crelling. Following his 1972 Ph.D. from Penn State, Jack worked in Bethlehem Steel's Homer Research Laboratory for five years before moving into a faculty position at Southern Illinois University-Carbondale. He retired in 2006, continuing to serve as a Research Professor until his death in 2018. Jack was involved with TSOP from the very early days of the society, and served in several leadership roles, including President in 1986, and later as the newsletter editor (1999-2002). Jack was always a positive and collegial participant at TSOP meetings, two of which he hosted in Carbondale along with short courses. Jack was recognized with numerous awards throughout his career, including the Cady Award (GSA), Reinhardt Thiessen Medal (ICCP), and Joseph Becker Award (AIME), along with the Outstanding Service, Ralph Gray, and Castaño Awards from TSOP. Jack mentored many students throughout his career and was a trusted confidant to his many peers throughout the world.

Petrography and Geochemistry of the Main Coal Seam of the Permian Gwembe Coal Formation, mid-Zambezi Valley, southern Zambia: comments on coal usage and environmental impacts

Imasiku A. Nyambe¹ and Robert B. Finkelman²

¹Department of Geology, School of Mines, University of Zambia, Box 32379, Lusaka, Zambia. Email: <u>inyambe@unza.zm</u> ²University of Texas at Dallas, Richardson, TX 75080, USA

Coal was discovered in the mid-Zambezi Valley of southern Zambia in mid-1960s in the Gwembe Coal Formation (Nyambe, 1999). Coal production declined to almost zero in the early 2000s until privatization of the mine. Since then, coal production in Zambia has steadily increased to 1,231,000 short tons in 2021. The reserves are estimated to be 140 million tons of high grade and thermal grade coal, spread over 1,070 hectares. Few papers have been published on Zambian Coal and, to our knowledge, there are no papers describing the geochemistry of these coals.

The Permian Gwembe Coal Formation of the Lower Karoo Group is a 280 m thick succession of carbonaceous, silty mudstones and siltstones with interbedded coal seams and sandstones. The Main Seam conformably overlies the Maamba Sandstone Member or rests directly on the Siankondobo Sandstone Formation or on Basement rocks. The Upper seams, occur in the upper parts of the Gwembe Coal Formation. The seams are usually thin (50 cm, commonly 1 to 30 cm). The Main Seam is exploited in the Kazinze and Izuma open pits with coal production used primarily for smelting in the Zambian Copperbelt, 300 MW power supply, minor domestic use and exporting to other countries. The proximate and ultimate analyses and Sulphur-form data are presented in Table 1.

	Sample Type	Location	Mine												
	1,900				Volatile							Calorific	Sulphate	Pvritic	Organic
١				Ash	Matter	FC	н	С	Ν	S	0	value	Sulphur	Sulphur	Sulphur
	grab	Siankond	Maamba												
Zm-99-1		obo	Kazinze Pit	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Zm-99-2	grab	Siankond obo	Maamba Kazinze Pit	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Zm-99-3	grab	Siankond obo	Maamba Kazinze Pit	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
7m-99-4	grab	Siankond	Maamba, Kazinze Pit	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
ZM-2000-	arab	Maamba	Maamba	26.3	n.u.	n.u.	n.d.	n.d.	n.u.	n.u.	n.d.	n.d.	n.d.	n.u.	n.a.
1	3		Kazinze Pit	6	17.73	53.79	2.8	60.06	1.12	0.7	6.84	23.29	0.01	0.49	0.2
Zambia2-	briquette	Maamba	n.d.	29.1	22.20	41.05	1.07	40.72	0.52	0.27	10.00	17.75	0.24	0.02	0.02
7ambia2-	briquette	Maamba	nd	26.2	23.30	41.95	1.97	45.75	0.55	0.27	12.03	17.75	0.24	0.02	0.03
2	briquotto	maamba	ind.	5	25.61	42.31	2.06	49.81	0.6	0.26	15.17	17.88	0.24	0.02	0
Zambia2-	n.d.	Maamba	n.d.	17.6											
3				5	20.87	59.39	3.28	67.93	1.5	0.95	6.6	26.8	0.17	0.19	0.59
Zambia2- 4	n.d.	Maamba	Maamb Colliery	18.3 2	19.61	59.7	3.25	68 64	1 45	1 13	4.83	26.95	0.02	0.47	0.64
Zambia2-	n.d.	Maamba	Maamba	17.3	10.01	00.7	0.20	00.04	1.40	1.10	4.00	20.00	0.02	0.47	0.04
5			Colliery	3	23	57.16	3.38	68.68	1.44	2.18	4.48	27.37	0.01	1.47	0.7
Zambia2-	n.d.	Maamba	Maamba	18.2	10.50	50.00	0.07				5.07		0.04		
6	ale a se a l	Maaraha	Colliery	3	19.56	59.92	3.27	68.48	1.41	1.24	5.07	26.83	0.01	0.54	0.69
Zambia2- 7	channel	waamba	Izuma	14.4 5	21.4	62.58	3.59	71.35	1.61	2.08	5.34	28.28	0.19	1.18	0.71
Zambia2-	channel	Maamba	Izuma	33.2											
8				7	17.34	48.04	2.33	47.37	0.94	14.6	0.14	20.82	0.2	12.99	1.41
Zambia2- 9	n.d.		Colliery	18.3 9	23.01	56.05	3.48	66.98	1.37	2.94	4.29	27	0.02	2.02	0.9
Total				219. 4	211 51	540.89	29.41	619.03	11 97	26.35	65 59	242 97	1 1 1	19 39	5.87
Total				- 4	211.01	3-0.09	23.41	013.03	11.57	20.33	00.09	272.31	1.11	10.00	5.07
Average				21.9	21.1	54.1	2.9	61.9	1.2	2.6	6.6	24.3	0.11	1.9	0.6

Table 1: Proximate and Ultimate data from samples collected from Maamba Mine Coal Seam, southern Zambia

Semiquantitaive X-ray diffraction (XRD) analysis of the low temperature ash of four samples indicated the dominant minerals in three of the samples to be kaolinite plus illite (>60%). Scanning electron microscopy (SEM) with energy dispersive X-ray (EDX) analysis revealed the presence of extraordinarily high concentrations (>20%) of anatase in two samples (ZM-99-1 and ZM-99-2). This is reflected in the TiO2 contents in the ash of 8.1 wt % and 13.6 wt %, respectively. Ankarite was a major phase (almost 40%) in ZM-99-4 reflected in the high contents of FeO (26.5 wt %), CaO (16.5 wt %), MgO (7.2 wt %), and MnO (about 1.2 wt %) in the ash (Table 2). Most samples had small amounts of quartz, siderite, calcite, pyrite and iron oxides. In addition to the clays, quartz, carbonates, and pyrite, SEM-EDX analysis also detected the presence of significant amounts of apatite, chalcopyrite and skutterudite and related (Ni, Co, As) minerals, which were unusually common. Textural relations indicate that chalcopyrite encased in quartz grains is detrital. Other minerals observed include sphalerite, zircon, crandallite group minerals and clausthalite.

Zm-99-3

Zm-99-4

ZM-2000-1

Zambia2-1

Zambia2-2

Zambia2-3

Zambia2-4 Zambia2-5

Zambia2-6

Zambia2-7

Zambia2-8

Zambia2-9

Total

Average

10.7

57

54.4

51.9

47.8

50.1

45.3

53

43.2

28.2

39.3

586

41.8

7

34.9

4.6

4.6

28.8

27.3

25

30.3

29.1

13.5

27.7

317.5

22.7

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0 15

7.2

0.17

2

2

0.37

0 47

0.46

0.42

0.33

0.22

0.54

15.2

1.1

16.5

0.36

12

14

0.59

15

1.7

1.7

0.75

0.96

1.8

60.5

4.3

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	SiO2	Al2O3	CaO	MgO	Na2O	K2O	Fe2O3	TiO2	P2O5
Zm-99-1	30.4	23.2	4.5	0.37	0.13	1.2	1.7	8.1	3.8
Zm-99-2	34	27.4	0.55	0.5	0.17	1.4	1.4	13.6	0.93

0.07

<0.01

0.08

0.41

0.29

0.06

0.19

0.19

0.2

0.08

0.13

0.2

2.2

0.2

0.28

0.09

0.43

6.2

6.2

0.95

2.5

2.7

2.3

1.3

1.7

3.5

30.8

2.2

26.5

5

3.4

3.8

9.3

4.5

9.8

4.2

13.6

50.7

12.6

147.3

10.5

0.62

0.42

2.4

0.78

0.61

2.5

2.8

2.6

2.7

2.5

0.92

2

42.6

3

0.08

0.6

0.68

0.68

0.4

0.77

0.76

0.82

0.31

0.39

0.67

12.6

0.9

Table 2: Major Oxides in the Ash from samples collected from Maamba Mine Coal Seam, southern Zambia

Fourteen coal samples were collected in 1999 and 2000 and were analyzed at the U.S. Geological Survey Laboratory for major, minor and trace elements and by a commercial analytical laboratory for Proximate, Ultimate and sulphur-form data. The samples consisted of five grab samples, two briquettes, four washed samples, two composite channel samples, and one unspecified sample (Table 1 above). The limited number of samples and the mixture of grab samples, briquettes, washed samples, etc. precludes any detailed interpretation of the analytical data, nevertheless, there are some general conclusions that can be drawn from the data. Data was obtained on 36 trace elements (Table 3). A notable feature is the high copper values (about 100 ppm) in two of the coal samples. The high copper values correspond to the presence of chalcopyrite. Elements of environmental concern (Hg, As, Pb, Be, Cr, Ni, Cd, U, Se) are generally low (less than the average for U.S. Coal) with a few exceptions. One high ash sample had 0.8 ppm Hg (U.S. average - 0.2 ppm), another had 72 ppm Cr (U.S. average 15 ppm). Arsenic concentrations ranged from 1 to 28 ppm (U.S. average - 24 ppm). Trace amounts of silver and gold were detected in several samples and cesium and niobium were exceptionally high in two samples. These traces are not surprising as the Chongwe / Lusaka area which is near the Maamba area contains gold with copper deposits or the gold may be related to the gold from Kansanshi in the Upper Zambezi River Basin. The two briquettes (Zambia2-1 and 2-2) appear to be a blend of coal and what was reported as chlorides. Alumina is exceptionally high in the ash.

Table 3: Trace Element Content in ppm on Dry, Whole Coal Basis from samples collected from the Maamba Mine Coal Seam, southern

Zambia.

	Ag	As	В	Ba	Be	Bi	Cd	Cl	Co	Cr	Cs	Cu	Ga	Ge	Hg	Li	Mn	Mo	Nb	Ni	Pb	Rb	Sb	Sc	Se	Sn	Sr	Те	Th	Tl	U	v	Y	Zn	Zr
Zm-99-1	0.52	1.26	<2.4	198	1.11	6.05	0.64	256	19.5	16.9	>23.5	103	14.8	5.74	0.15	6.45	12.9	16.1	18.6	4.59	38	10.4	0.8	5.05	3.5	12.9	272	0.97	10	0.19	4.8	31.1	33.7	22.6	126
Zm-99-2	0.46	1.39	<1.3	132	1.18	5.02	0.7	215	32.9	21.8	>12.5	94.2	12	9.36	0.08	2.55	3.07	1.06	>12.5	8.86	15.8	6.49	0.41	4.65	1.6	16.4	228	1.04	6.36	0.07	3.88	31.5	8.48	34.2	115
Zm-99-3	< 0.34	2.02	<6.7	113	1.16	0.86	0.06	213	25.2	73.5	4.37	13.7	14.6	4.21	0.09	78.5	19.2	6.73	5.76	43.4	9.81	9.18	1.69	6.16	0.17	3.51	31.6	0.15	5.33	< 0.034	1.89	161	13.1	37.8	114
Zm-99-4	< 0.41	28.4	<8.1	38.4	<0.41	0.26	0.21	193	37.5	11	1.9	< 0.81	4.56	2.67	0.81	7.96	3720	2.95	2.18	6.42	28.2	2.91	0.77	9.69	3	<1.3	40.4	0.06	<3.3	0.39	1.01	7.63	10.6	36.5	57.8
ZM-2000-1	0.33	9.32	20	203	3.06	0.72	0.13	<160	22.5	58.2	1.21	33.4	8.91	2.21	0.25	32.3	91.3	0.41	9.3	25.8	34.5	5.41	1.24	7.59	1	7.31	236	0.14	14	0.3	2.81	24.7	17.9	59.9	149
Zambia2-1	<0.68	0.88	57	137	<0.34	0.23	< 0.034	3320	4.99	10.4	1.02	10.3	1.73	0.51	< 0.03	16.6	319	0.34	1.22	14.1	13.4	79	0.51	1.7	0.11	<1.1	180	<0.034	2.75	0.06	0.61	15.3	4.41	33	65.1
Zambia2-2	< 0.64	0.9	34.2	151	<0.32	0.12	0.05	4390	5.37	12.8	1.02	11.7	1.79	0.64	< 0.03	16.3	286	0.42	1.06	12.3	6.43	76.8	0.29	1.76	0.13	1.12	231	0.03	2.72	< 0.032	0.67	13	4.51	397	64.9
Zambia2-3	0.37	2.25	12.7	120	1.9	0.6	0.05	172	7.64	39.5	2.38	25	8.68	3.78	0.21	12.9	131	0.62	5.69	9.16	19	10.6	0.14	5.05	0.44	4.1	136	0.14	9.29	0.2	2.32	20.7	8.9	17	117
Zambia2-4	0.5	2.02	18	39.4	3.6	0.69	0.09	192	7.95	36.5	12.7	14.4	11.1	3.46	0.24	49.5	15.1	0.82	7.84	8.03	9.13	54.6	0.13	6.32	0.28	4.95	71.9	0.13	10.5	0.63	3.2	21.7	13.8	23	109
Zambia2-5	0.43	2.57	24.4	29.1	3.61	0.7	0.13	<160	9.28	32.7	11.2	23.5	10.5	2.75	0.39	36.3	20.8	0.75	6.43	7.9	17.4	53.2	0.17	6.14	0.51	4.92	60.2	0.18	8.92	0.93	2.48	21.4	13.3	22.4	105
Zambia2-6	0.55	2.03	20.1	61.9	3.29	0.68	0.1	322	7.63	36.2	15.6	13.1	13.1	3.1	0.26	43.3	16.5	1	8.37	8.18	11.2	49.6	0.14	6.7	0.29	4.85	82	0.14	11.2	0.7	3.77	22.1	14.2	21.6	111
Zambia2-7	0.39	8.27	18.9	139	1.4	0.54	0.13	191	9.76	27	2.99	16.8	9.2	5.97	0.53	11.3	152	0.75	5.91	9.83	15	12.3	0.15	4.5	0.57	3.8	110	0.15	7.09	0.75	2.28	17.1	8.44	17.6	92.3
Zambia2-8	<0.67	19.2	68.3	43.6	2.3	0.4	0.15	<160	13.6	22.5	17.7	24	6.86	2.13	3.6	49.9	25.4	3.93	2.7	19.1	15.7	52.9	0.21	4.53	1.8	2.5	45.6	0.17	5.29	14.1	1.3	12	8.56	25.7	92.2
Zambia2-9	<0.39	3.01	35.9	33.8	3.22	0.25	0.07	202	11.4	34.9	22.4	15.2	11.8	2.78	0.58	50.7	19.3	0.96	5.07	6.81	19	66.7	0.27	5.44	0.44	4.03	39.7	0.11	8.41	1.45	2.06	26.4	9.01	19.9	84.5
Total	3.54	83.5	310	1439	25.8	17.1	2.5	9666	215	434	94.5	398	130	49.3	7.19	415	4832	36.8	80.1	184	253	490	6.93	75.3	13.8	70.4	1764	3.41	102	19.8	33.1	426	169	768	1403
Average	0.3	6	22.1	103	1.9	1.2	0.2	690	15.4	31	6.7	28.5	9.3	3.5	0.5	29.6	345	2.6	5.7	13.2	18	35	0.5	5.4	1	5	126	0.2	7.3	1.4	2.4	30.4	12.1	54.9	100

The relatively low concentrations of the elements and minerals (pyrite) of environmental concern indicate that the Main Seam coals do not present an environmental or human health threat if used properly. The low sodium contents and low to modest phosphorus and iron concentrations in the ash do not indicate any potential for technological problems such as fouling or slagging. Finally, the

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generally low concentrations of transition and precious metals do not offer the potential for economic byproduct recovery. However, the relatively high concentrations of Cu, Co, Ni, and Sn in some samples are consistent with the ore deposits in the Kafue River Basin. The averages of many trace elements (Ag, Co, Cr, Cs, Cu, Ga, Hg, Li, Mn, Nb, Pb, Rb, Sn, Te, Th, Te, Th, V, Y, Zr) in the Zambian coals (Table 3) are somewhat higher than their average in U.S. coals (Finkelman, 1993). Much of the difference can be attributed to the higher ash yield of the Zamnbian coals (23 wt % vs. 13 wt % for the U.S. coals).

References

Finkelman, R.B., Trace and minor elements in coal., 1993, In Organic Geochemistry, M. H. Engel and S.A. Macko, eds., Plenum Press. New York. p. 593-607.

Nyambe I. A. 1999. Sedimentology of the Gwembe Coal Formation (Permian), Lower Karoo Group, mid-Zambezi Valley, southern Zambia. In Smith D. N. and Rogers J. (Editors). Special Publication Number 28 of the International Association of Sedimentologists: Fluvial Sedimentology IV. Blackwell Science, Oxford. pp. 409 – 434. ISBN 0-632-05354-2

Announcing the 31st International Meeting on Organic Geochemistry (IMOG2023) 10-15 September 2023, in Montpellier, France



The 31st IMOG (International Meeting on Organic Geochemistry), hosted by the European Association of Organic Geochemists (EAOG) will be held from the 10th to the 15th of September, 2023, in Montpellier, France. This is the premier meeting for organic geochemists worldwide, held biennially, usually in Western Europe. The meeting focuses on all aspects of organic geochemistry, including petroleum geochemistry, biogeochemistry, coal geochemistry, environmental and forensic geochemistry, and so forth.

Abstracts are currently being accepted, and more details are available – along with a link to download the First Announcement & Call for Abstracts – at <u>https://imogconference.org/overview/</u>.

TSOP members will note that this IMOG will be held one week prior to the 2023 TSOP meeting, which is 17-24 September in Patras, Greece. If you can spare two weeks, after of week of organic geochemistry in France you can fly to a week of organic petrology in Greece!

More information is available at <u>https://imogconference.org/;</u> also, feel free to contact me with any questions (joecuriale1@gmail.com).

by Joe Curiale, EAOG Liaison, TSOP Liaison Committee

CALENDAR OF EVENTS

Please send in meeting, short course and special event announcements to the Editor http://www.tsop.org/events.html

2023

geochemical society	<i>July 9-14, 2023</i> Goldschmidt Conference – Lyon, France
TSOP The Society for Organic Petrology	September 17-24, 2023 39 th Annual TSOP Meeting – Patras, Greece
ICCP	September 7-24, 2023 <u>74th ICCP Annual Meeting</u> – Patras, Greece
THE GEOLOGICAL SOCIETY OF AMERICA®	<i>October 15-18, 2023</i> 2023 GSA Annual Meeting - Pittsburgh, PA, USA

Pyrolytic carbon from Late Devonian (Famennian) New Albany Shale

- provided by Cortland F. Eble



Both images are of pyrolytic carbon from the Late Devonian (Famennian) New Albany Shale, sampled from a drill core that intercepted two igneous intrusions. The pyrolytic carbon is high in reflectance (typically 4 to 5 %) and exhibits color mosaics when viewed in polarized light with a 1 lambda gypsum plate.