

## Report from Barcelona World Congress



On June 28-July 3, 2015 approximately 220 delegates gathered at the World Trade Center, Barcelona, Spain for the International Ozone Association's 22nd World Congress and Exposition. The World Trade Center, Barcelona is located on Barcelona harbor at Port Viel and is the landing point for many large cruise ships. Attendees were treated to a delightful location with perfect weather.

IOA President Dr. Achim Ried opened the congress and welcomed delegates. He summarized the role of the IOA and the uses of Ozone.



*Dr. Achim Ried opens World Congress*

EA3G President and Organizing Committee Chairman Prof. Santiago Esplugas also welcomed delegates and summarized the conference objectives. He thanked the exhibitors and sponsors and recognized the Organizing and Scientific

Committees.

Prof. Michel Roustan, Chairman of the Scientific Committee introduced the technical program which consisted of 143 long presentations and 34 short presentations with an accompanying poster presentation. 36 countries were represented in the technical program.

Dr. Renate Viebahn-Hänsler then summarized the medical technical program and the medical uses of ozone.



*Dr. Renate Viebahn introduces medical program*

Prior to dismissal to visit the Exhibition Hall, a welcome was made by Platinum sponsors SUEZ environnement and XYLEM/WEDECO.

At the conclusion of the opening session, a General Assembly was held. It was announced that a General Assembly would also be held in Dallas in September to announce new IOA Officers and elect IOA Board Members.

At the General Assembly, a moment of silence was held in memory of Dr. Rip Rice, who recently passed away.

### Technical Program

There were a total of 179 technical presentations, oral and poster from 36 countries covering many facets of ozone technology. Three parallel sessions were held throughout the congress under the following categories:

- Fundamentals
- Agrifood
- Water Treatment

- Ozone in Medicine
- Advanced Oxidation
- Disinfection
- Sludge Processing
- Micropollutants control
- Industrial Processes
- Workshop for young ozone people

Javier Navarro-Laboulais (Spain) presented *Determination of ozone Henry's constant using different analytical methodologies*. A new molar extinction coefficient was proposed. The solubility of ozone was measured between 5 and 35°C.



Javier Navarro-Laboulais discusses ozone Henry's constant

Mariëlle Pages and Frédéric Violleau (France) reported on *Ozone effects on fungal material*. Water containing ozone was used for the treatment of *Botrytis cinerea* and *Neofabrae alba*. The effectiveness of ozone was confirmed and byproducts were analyzed.

Chedly Tizaoui (UK) presented *Comparison of of ozone and UV-based techniques for removal of metaldehyde*. Ozone, UV, carbon nanotubes, hydrogen peroxide and ultrasound were investigated. Ozone combined with UV and H<sub>2</sub>O<sub>2</sub> resulted in a 90% removal of metaldehyde after 100 minutes. However, UV and H<sub>2</sub>O<sub>2</sub> resulted in 98.5% removal in the same time.

Joon-Wun Kang (Korea) presented the work of his university *Determination of optimum O<sub>3</sub> dose in drinking water treatment in Korea*. It was found that the decomposition of O<sub>3</sub> and the formation of OH• vary according to operating conditions, but the Rct values show a linear relationship with the kc value. Thus, the OH• exposure could be calculated throughout the reaction time and the required O<sub>3</sub> dose could be determined.

A. H. Knol (The Netherlands) reviewed *Peroxone in drinking water treatment: Dutch Challenge*. Ozone treatment of surface water in the Netherlands is a challenge due to the strict Dutch

guideline for bromate in drinking water of 1µg/L. With the combined use of ozone and hydrogen peroxide the bromate formation could be controlled.

James Jackson (USA) discussed *Retrofit of ozone contact basins with Sidestream Venturi gas injection*. It has proven economical to retrofit many existing contacting systems with sidestream venturi injection systems.

Nicole Brüggemann (Germany) presented *Ozone concentrations exceeding 15 wt% on an industrial scale?* The purpose of this paper with to initiate a discussion within the ozone industry in order to establish a consensus about the maximum ozone concentration used in field operations that still can be safely operated. Does it make sense to create an international standard?



Nicole Brüggemann discusses high concentration ozone

Andreas Scholz (Germany) discussed their work on *The influence of sample tubing on accuracy of low ozone concentration measurement*. Work at BMT indicates that decomposition can occur on the surface of the sample tubing, for example stainless steel. FEP tubing showed no measurable ozone decomposition. This paper will be reprinted in an upcoming issue of Ozone News.

Kerwin Rakness (USA) reviewed *Ozone Generation System Performance Testing Considerations*. This paper reviewed various levels of performance testing, basic or advanced, and what is required.

### **Medical Applications**

A major emphasis on medical ozone applications was made at the World Congress with 5 sessions being held with 26 technical papers and one workshop.

Dr. Renate Viebahn Hänslér opened the medical sessions with an overview of state of the art of ozone therapy. The

mechanisms for ozone action are well known and established; forms of application have been backed by preclinical and clinical studies. Guidelines for ozone therapy have been internationally published, but the use of ozone in medicine is still controversial. Literature data analysis was made to demonstrate that ozone therapy can be safe and effective. In a later presentation Dr. Viebahn explained that there is an European Directive for medical products and ozone generators are considered a medical device. The important criteria is the intended use of the product. In the USA, ozone must be approved as a drug, which makes it use very difficult.

A wide range of medical topics was presented, including:

- Ozonated oils
- Dentistry
- Disc degeneration
- Treatment of foot ulcers
- Osteoarthritis



*New exhibitor, Limicen Ozone R&D Center*



*Medical sessions*

At the conclusion of the technical sessions, a brief workshop was held, demonstrating proper techniques for ozone therapy.

## Exhibition

A centrally located exhibit hall was available for hosting the opening receptions and coffee breaks and was available throughout the conference for visiting with exhibitors. Companies exhibiting were:

- Ariva Technology (France)
- BMT Messtechnik GmbH/OSTI (Germany/USA)
- AirSep Corporation (USA)
- Dr. J Hänsler OZONASAN (Germany)
- Limicen Ozone R&D Center (China, USA)
- SUEZ environnement (France)
- Mazzei Injector Company/ Copersa (USA/Spain)
- PCI (USA)
- Statiflo (UK)
- WEDECO/Xylem (Germany)



*Booth traffic was good*

## Technical Tours

Two technical tours were offered:

- Sant Joan Despi Drinking Water Treatment Plant. This plant treats water from the Llobregat River and supplies almost 50% of the drinking water to the Barcelona metropolitan area. Ozone is used to remove several organic and inorganic compounds. A small fraction of the water is treated using ultrafiltration membranes and reverse osmosis. The plant visit was followed by a visit to the Museu Agbar des Aigües, a contemporary museum devoted to water.
- L'Aquarium de Barcelona. The Barcelona aquarium is the largest Mediterranean-themed aquarium in the world. The aquarium has a sophisticated purification system that operates in a semi-closed cycle with very little makeup water required. The treatment system features ozone and ultraviolet light.

## Closing Session and Awards

The World Congress closed with an awards session.

### Harvey Rosen Award

The Harvey M. Rosen Memorial Award was established in 1989 to recognize the best paper published in OS&E during the two-year period between World Congresses. Dr. Harvey M. Rosen was a prime mover behind the establishment of the International Ozone Association and of OS&E, the Journal of the Association. It was Harvey Rosen who recognized early in the 1970s the need for the establishment of an ozone association, and then pressed for the creation (in 1979) of a peer-reviewed technical journal dealing with all aspects of ozone technologies. Recipients of the Rosen Award are determined by consensus polling of the members of the Editorial Board of OS&E every two years.

The 2015 Harvey Rosen Award was given to Hans-Peter Kaiser, Oliver Köster, Markus Gresch, Philipp M. J. Périsset, Pascal Jäggi, Elisabeth Salhi and Urs von Gunten for their paper: *Process Control For Ozonation Systems: A Novel Real-Time Approach*. This excellent paper makes important contributions to the control of ozonation systems and results in reduced operating costs, thus improving the economics of ozonation.

The award was accepted by Prof. Urs von Gunten and Dr. Hans-Peter Kaiser. Prof. von Gunten addressed the congress giving a summary of the paper.



Prof Urs von Gunten (c) and Dr. Hans Peter-Kaiser receive Harvey Rosen award from Barry Loeb

### Best Poster Presentation

The award for the best poster presentation was given to Ana M. Chávez, Ana Rey, Pedro M. Álvarez and Fernando J. Beltrán (Spain) for their paper *Solar radiation activation of ozone for the degradation of water pollutants*. The award was accepted

by Ana Chávez.



Ana Chávez receives Best Poster award from Bernhard Paolini (Suez/Ozonía)

### Best Student Paper

An award for the best paper presented by a student was given. This was given to Asma Abdedayem, M. Guiza and A. Ouederni (Tunisia) for their paper *Effect of mono-metallic and bi-metallic supported catalysts on nitrobenzene ozonation*. Up to 99% removal of nitrobenzene could be removed by catalytic ozonation. The award was accepted by Asma Abdedayem who offered some comments on her paper.



Asma Abdedayem, author of best student paper

### Introduction of Next IOA President

At the close of the World Congress as is tradition, the IOA Chain was passed from current IOA President Achim Ried to the upcoming President, Michael Oneby. Mike will become IOA President on January 1, 2016. A formal introduction to Mike will occur at the Dallas conference and be reported in the next issue of Ozone News.



*IOA President Achim Ried (r) passes IOA chain to incoming President Michael Oneby*

**Social and Cultural Events**

The conference organizers made sure that there was plenty of time for relaxation and socialization in pleasant surroundings. The opening reception, featuring a wide selection of tapas, was held in the exhibit hall the Sunday before the Congress opening.



*Opening reception*

For accompanying persons and Congress delegates two cultural tours were offered, a full day tour of Barcelona and a tour to Figueres and the Dali museum.

The conference banquet was held at restaurant la Bodeguita del Poble located in the El Poble Espanyol. The Poble Espanyol, or Spanish Village, is an open-air museum comprising full-scale replicas of 117 buildings from different parts of Spain. It was built on Montjuïc Mountain for the 1929 International Exhibition in Barcelona and the diversity of its squares, streets and houses give it the feel of a real village. The banquet began

with an outdoor cava reception followed by a typical Catalan dinner. Following dinner, attendees were treated to a performance of Spanish dances.



*Park Guell on cultural tour*



*Banquet in El Poble Espanyol*

**Sponsors**

The IOA thanks the following sponsors who helped support the World Congress. Their support, financially and otherwise ensured the success of the Congress.

SUEZ environnement | Platinum and Special Prize sponsoring  
 XYLEM Services GmbH | Platinum sponsoring  
 AirSep Corporation | Coffee break sponsoring

Aigües de Barcelona| Technical tour  
 L'Aquarium de Barcelona| Technical Tour  
 Grupo Pacifico| Event organizer  
 Universitat de Barcelona| Organization support

### Organizing and Scientific Committees

Having an Ozone World Congress requires much work and organization. Organizing and Scientific committees were formed to handle the details of the general conference activities and the technical program. Committee members follow. The IOA thanks them for their efforts.

#### Chair

• Achim Ried, Germany| IOA President

#### Organizing Committee

• Santiago Esplugas, Spain| IOA· EAJG President  
 • Sylvie Baig, France IOA| Past-President, IOA· EA3G Past President  
 • Alain Lasalmonie, France| IOA· EA3G Secretary -Treasurer

#### Scientific Committee

##### Chair

- Michel Roustan| Emeritus Professor, INSA Toulouse, FR
- Antonio Arques Sanz| Professor, Polytechnic University of Valencia, SP
- Sylvie Baig| Dr., Suez environnement, Treatment solutions, FR
- Miray Bekbolet| Professor, Ege University, TR
- Stephan Brosillon| Professor, University of Montpellier, FR
- Martin Jekel| Prof. Dr.-Ing., Technical University of Berlin, DE
- Rosa M. Quinta Ferreira| Associate Professor, University of Coimbra, PT
- Roberto Rosal Garcia| Professor, University of Alcala, SP
- Juan José Rodriguez| Professor, Autonomous University of Madrid, SP
- Javier Navarro Laboulais| Dr., Polytechnic University of Valencia, SP
- J. Ignacio Lombraña| Professor, University of Basque Country, SP
- Frédéric Violleau| Dr., Purpan, FR
- Fernando Beltran| Dr., University of Extremadura, SP
- Marcia Dezotti| Professor, Federal University of Rio de Janeiro, BZ
- Nathalie Karpel Vel Leitner| CNRS Research Professor, Poitiers University, FR
- Chedly Tizaoui| Dr., Swansea University, UK
- Joël Albet| Professor, ENSIACET Toulouse, FR
- Jean· Stephane Pic| Dr, INSA Toulouse, FR

#### Medical Part

- Ziad Fahmy| Dr., Chief of the Augusta Clinic in Rheumatology Bad Kreuznach, DE
- Olga Leon| Prof., Havana University, CU
- Nabil Mawsouf| Prof., Cairo University, EG
- Renate Viebahn· Hänslér| Dr., Med. Ozone Society, DE
- Mark Weiser| Dr., Dental Clinic Santa Barbara, US

#### Proceedings

Proceedings from the conference are available on a smart stick. To purchase a copy, please contact the IOA-EA3G office at [ioa@esip.univ-poitiers.fr](mailto:ioa@esip.univ-poitiers.fr)

In summary, this was another very successful World Congress, thanks to the efforts of all those who worked to make it a success. Those who attended returned home with fond memories of Barcelona, renewing acquaintances and learning more about the world of ozone.



*Conference lunches*



*The busy registration desk*