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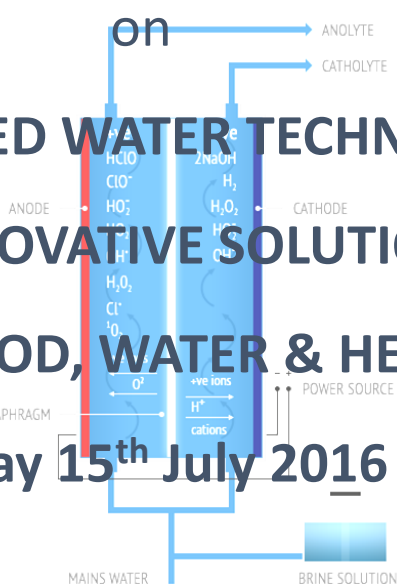


REPORT

INDO - SPANISH WORKSHOP

**ELECTROLYZED WATER TECHNOLOGY:
AN ECO-INNOVATIVE SOLUTION FOR
AGRO, FOOD, WATER & HEALTH**

Friday 15th July 2016



In Collaboration with



European Business and Technology Centre



AMITY INSTITUTE OF BIOTECHNOLOGY

AMITY SCHOOL OF EARTH AND ENVIRONMENTAL SCIENCES

Indo-Spanish Workshop on Electrolyzed Water Technology

15th July 2016



Amity Institute of Biotechnology (AIB) and Amity School of Earth and Environmental Science (ASEES) are jointly organizing **Indo-Spanish Workshop on Electrolyzed Water Technology on July 15, 2016** in collaboration with Sana Water Solutions (Spain, www.sanawatersolutions.com), the European Business Technology Centre (India - <http://ebtc.eu>), and Society for Sustainable Agriculture & Resource Management (SSARM). The workshop was led by Grégoire Gaume, Co-Founder & CTO, Sana Water Solutions from Valencia, Spain and Prof. R. K. Behl, SSARM to provide participant basic knowledge, working principle and numerous benefits of Electrolyzed Water Technology for the Agro, Food, Water and Health industries. Today also marked for announcement of opening a NCR chapter of Society for Sustainable Agriculture & Resource Management (SSARM).

The details of the workshop:

Topic:	ELECTROLYZED WATER TECHNOLOGY
Nature of Event:	International Workshop
Resource Person:	Grégoire Gaume, Sana Water Solutions, Spain Prof. R. K. Behl, SSARM, India
Venue:	C-214 C-Block, Conference Room (2 nd Floor)
Number of Participants:	38
Workshop Convener	Prof. Rajendra Prasad, Director AIB/AIISH
Workshop Coordinators	Dr. Machiavelli Singh, AIB Dr. Surender Khatodia, AIB Dr. Biswarup Sen, AIB Dr. Kushagra Rajendra, ASEES

Program schedule

Program	Venue	Time
Meet & Greet (Resource persons and Industry representatives)	VIP Lounge	11:00 – 11:30 AM
Registration	C-214	11:00 – 11:30 AM
Introductory remarks: Water – Some reflections, Dr. Kushagra Rajendra, ASEES		11:30 – 11: 50 AM
Technical Session: Gregoire Gaume, Sana Water Solutions, Spain “Electrolyzed Water Technology: An Eco-innovative solution”		12:00 – 01:00 PM
Research Prospective in Sustainable Sciences: Prof. R.K. Behl, SSARM, India		01:00 – 01:20 PM
Announcement of opening a NCR chapter of Society for Sustainable Agriculture & Resource Management (SSARM) jointly by Prof. R.K. Behl, SSARM, India and Prof. Padmakali Banerjee, Pro Vice Chancellor, AUH		01:20 – 01:40 PM
Felicitation of Resource Persons by Pro Vice Chancellor, AUH: 1. Prof. R. K. Behl, SSARM 2. Dr. Gregoire Gaume, Sana Water Solutions, Spain 3. Mr. Daniel, Embassy of Spain, India		01:40- 01:45 PM
Lunch Break		01:45 – 02:30 PM
Workshop demonstration Production and Analysis of Electrolyzed Water	ALG 07 Biotech Lab	02:30 – 04:30 PM
Concluding remarks and blessings by Prof. P. B. Sharma, Vice Chancellor, AUH		4:30 – 4:45 PM

Theme of the Workshop:

EW is a true example of Biomimetic Science (imitation of the models, systems, and elements of nature for the purpose of solving complex human problems). EW mimics the human immune system by producing the same acting agent (HOCL, Hypochlorous acid) than the white blood cells (Neutrophil) when the body comes under attack from invading pathogens. EW is the most efficient and non-toxic disinfectant known today (WHO). It is produced from Water, Salt and little Electricity and can be used in the form of Liquid, Ice and Aerosol. Today more than 50 countries all across the globe are getting benefited by range of applications for sanitation, healthcare to agriculture.

Benefits of EW: Increase production yields and quality (agriculture, animal farming, milk production, etc.), plants and animal health, reduce water demand, reuse wastewater for irrigation/process water (close loop cycles), replace some phytosanitary treatments, increase shelf life of food products, energy savings, equipment cleaning without chemical products, ecological disinfection of water, 100 times more efficient than chlorination, non-toxic and 100% biodegradable. A demonstration cum hands on workshop on Electrolyzed water processing unit will be organized for participants. In the era of climate change where water use and consumption pattern is transforming, electrolyzed water will provide hope for various solutions towards service of mankind.



Registration of Participants: A total of 38 participants has attended the workshop including young faculty members, research scholars mainly from interdisciplinary areas of biotechnology, environmental science and applied sciences, and industry representatives. The workshop is a truly

interactive in nature where participants has come up with number of queries about the production of electrolyzed water and their application. The active engagement of Vice Chancellor and Pro Vice Chancellor gave a serious concern for water challenges of recent time and for their solution through promising technologies. (Participants list is attached in Annexure 1).

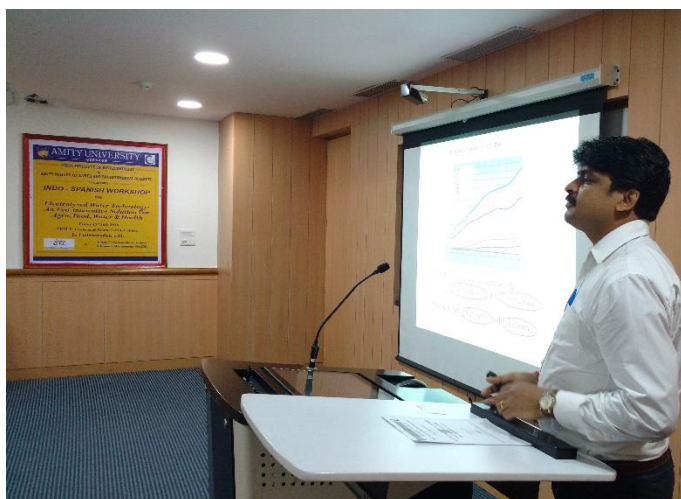
Networking Meeting

The International Workshop started with networking meeting led by Prof (Dr) Rajendra Prasad, Director, AIB & AIISH further Vice Chancellor Prof P. B. Sharma gave a prospective on water scenario and challenges of current era and also discussed modalities of today's workshop. In meantime Deputy Vice Chancellor briefed regarding mission and vision of Amity and leadership of founder President.



Technical Session

The workshop started with clear agenda of understanding of technology and live demonstration of production of electrolyzed water through interactive sessions of lecture and practical. The prospective and need of innovative technologies in water sector has been emphasized by **Dr Kushagra Rajendra**, Head of Department, Amity School of Earth & Environmental Sciences who has delivered a scientific talk on the “Water – Some reflections”. He presented an understanding on current water challenges what human being facing today. He discussed water footprint, consumption scenario and need of interventions towards sustainable utilization.



Dr Grégoire Gaume, Sana Water Solution has discussed on the thematic area "Electrolyzed Water: Eco-innovative solution for the Agro Food Industry", which provide safe and healthy water using eco-innovative and cost-effective water technologies that address the challenges of today. Dr. Gaume in his session discussed the working principle, production process, product optimization and their range of applications for food, healthcare, disinfection, sanitation and agriculture. He further empathized the reliability and reproducibility of this novel approach which is very much useful in the field of agriculture, dairy and water industry that suits the need of developing countries".



Electrolyzed Water is an universal biocide eliminating all kind of virus, bacteria, fungus, spores, algae, mold. It is 100% biodegradable and harmless for human and environment which each ecological and cost-effective alternative to traditional disinfection methods: 70-80 times more efficient than chlorination/sodium hypochlorite (Culp/Wesner/Culp, 1986)



Three different kinds of solutions can be produced out of the unique and patented electrolysis cell because of its permeable membrane and high quality rare materials of the Anode and Cathode:

Acidic Anolyte (A)

Active Chlorine mg/l = 500 - 700 ppm // pH = 2,0 - 3,5

ORP (Reduction potential) = 1.000 – 1.200 mV

Disinfectant, sterilizer, fast acting

Used whenever pH is unimportant (no danger of corrosion)

Catholyte (K)

Active Chlorine mg/l = 0 ppm // pH = 11,0 - 13,0

ORP (Reduction potential) = -800 – -900 mV

Alkaline solution, excellent washing liquid, removes heavy metals from water through precipitation.

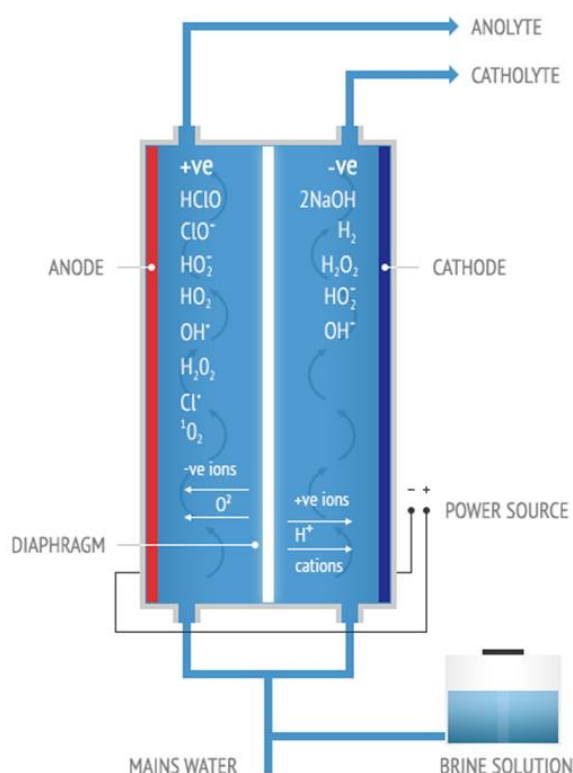
Neutral Anolyte (ANK)

Active Chlorine mg/l = 500 - 700 ppm // pH = 5,0 - 8,5

ORP (Reduction potential) = 700 – 900 mV

Disinfectant, sterilizer

Used wherever pH is important (e.g. corrosion)



Electrolysis cell for EW production

Prof R K Behl, SSARM, gave a talk on “Research Prospective in Sustainable Sciences”. He expressed the various concerns and solutions of sustainability prospective and its research potential for young entrepreneurs and researchers in current scenario with several classic examples from water, agriculture and healthcare sectors. He emphasized the research opportunities emerging in sustainable sciences through grass-root innovations, traditional knowledge and cross cutting technologies developed to address the emerging challenges. His session gave a platform for participating inquisitive minds through interactive question answer session.



Society for Sustainable Agriculture & Resource Management (SSARM) - NCR chapter

In backdrop of initial effort of **Dr. Surender Khatodia** and **Dr. Machiavelli Singh**, Prof. R.K. Behl, President, SSARM, India and Prof. Padmakali Banerjee, Pro Vice Chancellor, AUH jointly announced the 'opening of Society for Sustainable Agriculture & Resource Management (SSARM) - NCR chapter' at Amity University Haryana, Gurgaon. It will provide a platform for greater academic interactions and outreach for National Capital Region (NCR) to promote and ensure sustainable agricultural practices and resource management. Both the dignitaries have given greater impetus to foster the joint collaborative research efforts in said areas including water, agriculture and health. Regular academic activity in form of expert talk is initially planned in this regard.



Prof Padmakali Banerjee interacted and congratulated participants of workshop with her motivational speech and honored resource persons and embassy representative of Spain with Amity mementoes. Prof Banerjee highlighted university commitment to ensure sustainability in different walk of resource consumption i.e water, power.



Demonstration and hands on

Dr Gaume with help of Dr Sen arranged practical session to demonstrate instrumentation and production of electrolyzed water for participants. The practical session includes finer details about raw material (Industrial salt, RO water, Electricity), instrument (Processing and production unit) and Electrolyzed water in sequential manner. Various physical and chemical testing has been carried out to ensure the basic qualities of electrolyzed water. This session is truly reflection of practical component of pre-technical session.



Concluding remarks

Honorable Vice Chancellor **Prof P. B. Sharma** visited to the practical session with his typical inquisitive approach to understand the innovative technologies for conservation of precious resource of water as well as purification of contaminated water bodies including our holy rivers. The heavy metal contamination i.e. Arsenic, Zinc, Cadmium and aqueous fluoride in water bodies are affecting health of affected



population, which need out of box solution. He has not only participated in question answer session but also share his views on importance pristine gift of nature; water. He congratulated the participants, organizers and resource person for their active participation to make workshop a grand success. All interested participants were distributed with prepared electrolyzed water in lab grade bottles for their future respective research work and validation of quality.

Organizing Committee proposed vote of thanks to Industry representatives (Tiwari exports and Corp Furniture, Jaipur; Shree Nivasa Agrochem, Aurangabad), participating young researchers and faculty members from MDU. Rohtak, KLP College, Rewari, RBS College, Agra and Amity University Haryana for their active presence and interactions. A token of respect to academic leaders of AUH for their kind approval and financial support in successful completion of International workshop. A special mention of lab staff is for their active support during practical session.

GLIMPSES OF THE WORKSHOP





PREPARE TO **FULFILL DREAMS** WITH INDIA'S LEADING EDUCATION GROUP

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Rapporteurs: Dr. Surender Khatodia & Dr. Machiavelli Singh