



# ASSOCIATION OF CHEMISTRY TEACHERS

## NEWS LETTER

ISSUE : 12, SEPTEMBER - DECEMBER 2018



# ACT News Letter, Issue 12

September – December, 2018

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Disclaimer : The views expressed are that of the authors and ACT is not responsible in any way for them.

**Association of Chemistry Teachers**  
Promoting Excellence in Chemistry Education

**From the Editorial Desk .. -**

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Prof. Brijesh Pare, Jawaharlal Nehru P.G. College, Ujjain.



Dr. Mannam Krishnamurthy, Editor

Varsity Education Management Limited, Hyderabad

We are happy to inform that the contributions of ACT ranges from International Olympiads, organizing seminars, science exhibitions, workshops, expert invited talks, innovating conceptual science experiments, conferences, talent search examinations, training faculty and students etc. ACT proposes some new activities to be implemented.

We are bringing in the present issue of the news letter with the reports on the ACT activities, latest innovations, new trends, views and news. We have included two general articles in the present issue. We have also included report on NCCT-2018, subject reports on International and National Chemistry Events. Reports on two RSC-ACT teacher workshops were given briefly.

We invite good suggestions and better contributions from the readers to get best output of the future issues. We welcome you all to participate in the International Year of Periodic Table (IYPT-2019) and make 2019 an eventful year.

## Promoting Excellence in Chemical Education

Dr. Upadhyayula Muralikrishna,  
Professor of Chemistry (Retd.)  
Andhra University, Visakhapatnam-533 017.



The dictum 'promoting excellence in chemistry education', in the ACT News letter prompted me to share some of my views on this aspect. Promoting excellence need not be limited to chemical education only, but can be extended to education in general. This aspect is very much interlinked with the teacher to the student always throughout his life as a teacher, because knowledge is never static but is ever dynamic. Excellence is manifested in continuous acquisition of ever growing of knowledge. This coupled with translation of the new knowledge and information to the learner in a manner that received by the latter with enthusiasm may be termed as promotion of excellence.

Chemistry is one of the means by which man describes reality. When one is tired of chemistry he is tired of his life for there is in chemistry all that life requires 'any educational programming should bring in the children (learner/student) improvement in their behavioral pattern resulting in more wholesome development of personality' (M K Gandhi). 'Education is the drawing out of the best in the children in all the three facets of the child: body, mind and spirit' (Swami Vivekananda).



Children mix chemicals in test tubes as part of a hands-on chemistry education program

Government of India soon after independence realized that the large potential of human resource should be effectively tapped and initiated appropriate measures towards this aim. One such measure is to give fillip to University and higher education. This is expected to boost the manpower requirements and manage production in the upward direction. But the efforts of the government alone are not enough. Herein fits the efforts of ACT and such other organizations of promoting excellence in chemical education in a big way such that a large component of work force with skills, competence and expertise is turned out of colleges and universities. Unfortunately the university-industry interactive participation is yet to take place in a big way, which may be expected to result in book to lab to industry activity (one example looked at in an indirect way is Haber's ammonia synthesis).

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Article prepared on 25-12-2018, 86<sup>th</sup> Birthday of Prof. Upadhyayula Muralikrishna

Chemistry is one of the factors that play a key role in establishing and in the process line of the chemical industry because of its connection with the materials necessary for the industry. The raw materials and the process for conversion to the desired product are intimately related to chemistry. 'Science broadly considered is incomparably the most successful enterprise human beings have ever engaged upon; Chemistry is central science not only because of its connection to all branches of sciences but also because of its wide ranging influence of the way we live' [Peter Medowder, Nobel Laureate in Biology], and of late in our life styles. To know materials we need chemistry; to transform one type of the material to another we need chemistry.



Demonstration  
in a chemistry  
class

Chemistry without the laboratory is soup without salt. We begin laboratory exercise with experiment, observation and inference. As we grow up in acquiring knowledge in chemistry we move over to synthesis (preparation), purity and cost effectiveness. As such the earlier information in the 3S (sensitivity, selectivity and specificity) gets modified to 3R (readability, repeatability and realisability). Promoting excellence in chemical education should take cognizance of the evolution out of chemistry the new areas of molecular biology, nanotechnology, material science, computational chemistry etc. Further, a change from pedagogy to performance also has evolved.

From what has been outlined there is pertinent recognition and suitable corrective measures are necessary to build up 'faith in teachers in their profession before the society loses faith in them'. Both the course content and the methodology of information transference to the student in chemical knowledge has undergone a sea of change from the Mc Caulay's 'fit for the job' British system of pre-independent India to innovative, skills based, creative thinking applicable system. This, therefore, puts the teacher to greater commitment to promote excellence in the student such that he is motivated to quickly modify and adopt the book to lab the pilot plant scale production oriented system. To this end any measure for promoting excellence in teaching of chemistry should inspire the student or seeker of knowledge towards building up of skills, competence and expertise.

One of the aspects of promoting excellence in chemical education lies in realizing that ideas do not spring up but result from methodical hard work, which in turn is linked up with continuous addition of knowledge and information regularly at all the levels of educational ladder, namely, primary, secondary and higher education level. The sooner the teachers recognize this the better will be the way for promoting excellence. Further, the sooner the teacher shakes off his dogmatic thinking about the low standard of knowledge and information of the student the easier it will be for promoting excellence.

In conclusion, I wish to add that what is recounted may be a figment of what the ACT is trying to achieve. Let us hope ACT New Letter will be successful in its efforts to promote excellence in Chemistry Education and Popularization of Chemistry.

## The Role of Chemistry Olympiads

Prof. D.V. Prabhu,

General Secretary, Association of Chemistry Teachers  
Department of Chemistry, Wilson College, Mumbai



Source : Chemical Industry  
Digest, October 2018

### Changes in Chemistry Curriculum

Chemistry education has undergone rapid transformation due to the changing face of chemical research which has become more and more interdisciplinary in nature. Chemistry has changed from structure driven to function driven and today is more about systems than just molecules. Today's 'Borderless Chemistry' has broken the barriers of the traditionally disciplined chemistry. Hence it is imperative that modern chemistry education has to be driven by these emerging trends and our students should be given a flavor of research in their college/university days.

International Chemistry Olympiad (IChO) has emerged as a major innovator of Chemistry Education especially in our country. The International Chemistry Olympiad, started in the erstwhile Czechoslovakia, has emerged as the most challenging Chemistry competition for pre-university students. It brings together the most gifted and motivated students of the world in a friendly competition of the highest level. It is probably the only competition which emphasizes both theory (60% weightage) and experimentation (40% weightage). The questions (multiple choice and theory) are non-conventional and of high calibre which test the students' understanding and comprehension of the subject, reasoning and logical thinking and problem solving skills and is not based only on memory. The experiments are open ended and detailed protocols are provided which have to be followed meticulously. The IChO syllabus is regularly revised by the International Chemistry Olympiad Committee.

India has been participating in IChO since 1999 and has done remarkably well earning medals and ranks. India hosted the 33<sup>rd</sup> IChO in 2001 at Mumbai – an event which had a huge impact on Chemistry Education in our country. Homi Bhabha Centre for Science Education (TIFR) is the nodal agency of the Government of India for organizing Science Olympiads in the country and for selection and training of the Indian teams participating in the various International Science Olympiads. The Indian Olympiad programme is fully funded by the Government of India through MHRD and its funding agencies like DAE, DST and BRNS. Association of Chemistry Teachers, the national registered body of chemistry educators is actively involved in the Indian National and International Chemistry Olympiads. It is a matter of pride that India features among the top 5-8 teams and almost all students have won medals.

### Some Offshoots of IChO

The International Chemistry Olympiad is the harbinger of innovation in Chemistry Education. The important offshoots of IChO are:

1. The innovative and focused nature of the Olympiad examination questions is being increasingly reflected in the competitive and college examinations held in the country.
2. Perceivable changes are seen in the teaching of Chemistry especially experimentation.
3. National level research institutions and distinguished scientists are getting involved in Science education.
4. Resource generation camps (RGCs) are increasingly being organized for school and college teachers to generate good quality questions and to device new experiments.

The Indian National Olympiad programme follows a five stage process, which is detailed in the article.

## Report on NCCT-2018

National Convention of Chemistry Teachers (NCCT)-2018, an annual event of ACT was hosted by Regional Institute of Education (NCERT), Ajmer, Rajasthan State during 25-27 October, 2018. Prof. V.P. Singh, Secretary ACT central zone acted as convener of the convention.

National Conference on 'New Frontiers of Research and Education in Chemical Sciences' was organised during the convention.

Prof. G. Viswanathappa, Principal RIE, Ajmer Chaired the inaugural session. Prof. S.C. Ametha, Dean of Science, Pahal University, Udaypur, Dr. R.V. Singh, Emeritus professor, University of Rajasthan, Jaipur and Prof. Ranjit K. Verma, Vice-chancellor, Munger University gave valuable address and messages in the session. ACT-2019 awards were presented at this session.

There were 8 invited talks in the conference by eminent persons. About 80 research papers were presented in oral and posters of ten technical sessions conducted on three days.



Second Executive Council meeting of 2017-2018 was held on October 25, 2018 at 6 pm at the conference hall of Regional Institute of Education, Ajmer.

Dr. D. V. Prabhu, General Secretary, ACT read out the minutes of first EC meet of 2017-2018 held on March 8, 2018 at HBCSE (TIFR), Mumbai. The minutes were accepted and passed. He also presented the report of ACT activities conducted during the period October 2017-October 2018.

Mrs. Swapna Narvekar, Treasurer, ACT presented the audited Statement of Accounts and balance sheet for the year ended March 31, 2018.

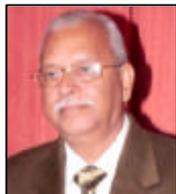
Prof. S.P. Singh, National Coordinator, CONTECH gave details of the Concept Test in Chemistry for under graduate students, held in October 2018. Prof. Helen Kavitha, convener of MTCSGC gave a detailed report on the preparation of International Chemistry Conference. Prof. Brijesh Pare, National Coordinator gave a detailed report of ACT-RSC Chemistry Popularisation workshops for high school teachers, conducted during April-October 2018.

Proposals on the activities of 'The Internal Year of Periodic Table' and some new suggestions were discussed by council members. These proposals are accepted for implementation.

## ACT Awards - 2018

Association of Chemistry Teachers Awards for 2018 were presented at the National Convention of Chemistry Teachers (NCCT)-2018 on 25<sup>th</sup> October, 2018, at Regional Institution of Education, Ajmer, Rajasthan State.

The editorial board of ACT News Letter extends hearty congratulations to all the ACT award winners.



**Prof. Suresh Ameta,**  
is the winner of  
**ACT Life Time Achievement Award-2018**

1

*Prof. Suresh Ameta, Dean, Faculty of Science, PAHER University, Udaipur* received Life time achievement award. Prof. Ameta was former president of Indian Chemical Society. He guided 85 Ph.D.s, published 350 papers and has written 35 books. He is referee of several Indian and Foreign journals. He is fellow of Royal Society of Chemistry, London. He had received earlier life time achievement awards of Indian Chemical Society and Indian Council of Chemists. He was named as scientist of the year 2002 by National Environment Science Academy, New Delhi.

2

**Prof. R.V. Singh**  
is the winner of

**ACT Life Time Achievement Award-2018**



*Dr. R.V. Singh, Emeritus, Professor of Chemistry, University of Rajasthan, Jaipur,* received Life time achievement award. Prof. Singh was UGC BSR Faculty Fellow. He guided 52 Ph.D.s and published 550 papers in interdeciplinary fields of Chemistry. He has worked as vice-chancellor, Mahatma Jyoti Rao Phoole University, Jaipur. He is recipient of several awards including the prestigious Acharya J.C. Ghosh Memorial Award-2011 by Indian Chemical Society, Kolkata and E.P.P. Gold medal-2017 by International Society for Ecological Communications.

3



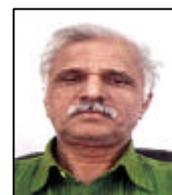
**Dr. Sakina Bootwala,**  
is the winner of  
**ACT Best Woman Chemistry Teacher Award-2018**

*Dr. Sakina Bootwala, Associated Professor of Chemistry, Wilson College University of Mumbai, Mumbai* received Best Woman Chemistry Teacher Award. Dr. Bootwala is research guide and postgraduate Chemistry Teacher of University of Mumbai. Four UGC research projects were completed by her. She had 19 papers, presented 11 papers in Conferences and contributed 7 book chapters. She was awarded Rula International Award at Malaysia.

4

Prof. Prem Mohan Mishra,  
is the winner of

Shri Anupam Sinha Best Chemistry Teacher Award-2018



*Prof. Prem Mohan Mishra, Department of Chemistry, MLSM College, Darbhanga, received Shri Anupam Sinha Best Chemistry Teacher Award. Prof. Mishra is now Director at Centre for Advance Research in Nanoscience and technology, Lalit Narayana Mishra University, Durbhanga (Bihar). He is active in Popularization of Chemistry through talks on All India Radio and outreach programmes. He guided 13 Ph.D, published 100 papers and has written 22 books. He was awarded Sahitya Academy Bala Sahitya Puraskar for his book 'Bharat Bhagya Vidhata'.*



Prof. Ranjit Kumar Verma,  
is the winner of

Prof. Lallan Singh Award for Best PG Chemistry Teacher-2018

*Prof. Ranjit Kumar Verma, Vice chancellor, Munger University, received Prof. Lallan Singh Award for Best PG Chemistry Teacher (State Universities). Prof. Verma was Former Pro Vice Chancellor of Patna University. He is the editor of Journal of Indian Chemical Society and Associate editor of one of the Springer Journal. His name is included in Who's who in Thermal Analysis and Calorimetry published by Springer. He guided students for Ph.D. and organized several conferences. He has 85 research papers and several presentations in conferences.*

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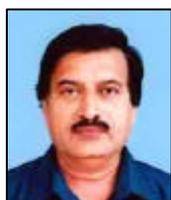
6

Prof. Nigamanand Das,  
is the winner of

Prof. Bhupendra Sahai Saxena Award for Best PG Chemistry Teacher-2018



*Prof. Nigamanand Das, Professor of Chemistry, Utkal University, Bhubaneswar, received Prof. Bhupendra Sahai Saxena Award for Best PG Chemistry Teacher. Prof. Das has successfully completed 13 research projects. He has published 104 research papers in reputed journals and has one patent to his credit. He has participated in many conferences and delivered 45 invited talks on different aspects of chemistry at National and International venues.*



Prof. P.V.S. Machiraju,  
is the winner of

Dr. Uma Sai Prakash Chemistry Popularisation Award-2018

*Prof. P.V.S. Machiraju, Dean R & D and Professor of Chemistry at Pragati Engineering College, Surampalem, A.P., received Dr. Uma Sai Prakash Chemistry Popularization Award. Prof. Machiraju has enormous contribution to popularization of chemistry, education through scientific talks, lessons through electronic media, popular articles and training campus. He organized NCCT-2017 at Pragati Engineering College. He has published 44 papers and presented papers in several conferences.*

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### Awards for ACT Members

Two Chemistry teachers and ACT life members were felicitated with awards on 5<sup>th</sup> September 2018.

**Prof. Wasudeo Gurnule**, Kamala Nehru Mahavidyalaya, Nagpur and Member ACT EC received Best Research Award at the hands of Honourable Vice Chancellor, **Dr. Ashish Paturkar**.



Principal **Dr. Radha Kant Prasad**, Science college, Patna was felicitated on the occasion of Teachers Day by **Prof. Rash Bihari Prasad Singh**, Honourable Vice Chancellor of Patna University.

### Academic Participation of ACT Members

**Dr. M. Krishna Murthy**, Director, AN University Research Center and ACT EC Member gave an invited talk on 'Chemistry of Corrosion', at Annamacharya Institute of Technology and Sciences, Rajampet, Andhra Pradesh on 15<sup>th</sup> September 2018.

**Prof. M. Swaminathan**, ACT EC member from Kalisalingam University, Krishna Koil was a guest speaker at the inaugural session of International Conference on 'Multifunctional Advance Materials', organized by Kamala Nehru Mahavidyalaya, Nagpur on 5<sup>th</sup> October 2018. **Dr. Wasudeo Gurnuel**, ACT EC member was among the active organizers.

**Dr. Hemant Pande**, Vice President, ACT West Zone acted as member of organizing committee and participated in the panel discussion at India International Science Festival, Lucknow during 6-7<sup>th</sup> October 2018.

**Mr. G. Srinivasarao**, Life member ACT acted as convener for the International Conference on Science Computers Technology and Engineering, organized at SVRM College, Nagaram, AP on 26-27 October 2018. **Dr. Mannam Krishnamurthy**, Varsity Education Management Ltd., Hyderabad gave a talk on 'Hydrogen Fuel Technology'.

**Dr. Subhash Prasad Singh**, Secretary ACT East Zone, represented A.N. College, Patna in the revision of Class XI & XII Chemistry board syllabus, at NCERT, New Delhi on 1<sup>st</sup> November 2018.

**Prof. Prem Mohan Mishra**, Vice President ACT East zone organized one day seminar on 'Bio Conjugated Nano particles and it's structure, at M.L.S.M. College, Darbhanga on 17<sup>th</sup>, November 2018.

**Prof. P.K. Jha**, M.S. University, Baroda delivered key-note address.

**Prof. G. Nageswara Rao**, ACT Life member and Vice-chancellor, Andhra University organized Alumni Meet at Visakhapatnam on the National Chemistry Day, 10, December 2018. **Mr. Ratan N Nata**, Chairman TATA trusts and **Dr. G.M. Rao**, Chairman GMR Group graced the occasion and gave valuable messages.

## ACT Members at International Venues



Prof. Brijesh Pare, Vice president, ACT Central Zone organized six chemistry popularization workshops at Abu Dhabi and Qatar during 2<sup>nd</sup> week of October 2018. The Atal Tinkering Lab was inaugurated at Birla School, Doha on 17,



October 2018. Indian ambassador to Qatar, Mr. P. Kumaran was also present at the inauguration of the laboratory.



Dr. Wasudeo Curnule, Kamala Nehru Mahavidyalaya, Nagpur and EC member ACT delivered an invited talk on 'Nanoscience and its impact on Society' at the Bangladesh Chemical Conference, on 19-20, October 2018. Dr. Takayuki



Nonoyama of Hokkaido University, Japan also gave another invited talk on 'Hydrogel Processing Thermoreversible Robustizing'.



Dr. Hemant Pande, Vice president, ACT West zone acted as resource person for workshops on innovative teaching technology at Dubai, Sharjah, Abu Dhabi and Al Ain during 10-17, November 2018. Students from 40 schools parti-



ipated in activities like essay competition, poster making, elocution and science exhibition. This fest was organized by Science India Forum (NGO), working for promotion of Science in Schools of India and UAE.



Prof. P.V.S. Machiraju, Vice president, ACT South zone participated in the International Conference on Science and Technology Research, on 26-27, December 2018 at Dubai. The ppt. on 'Quality evaluation of surface water' was selected as



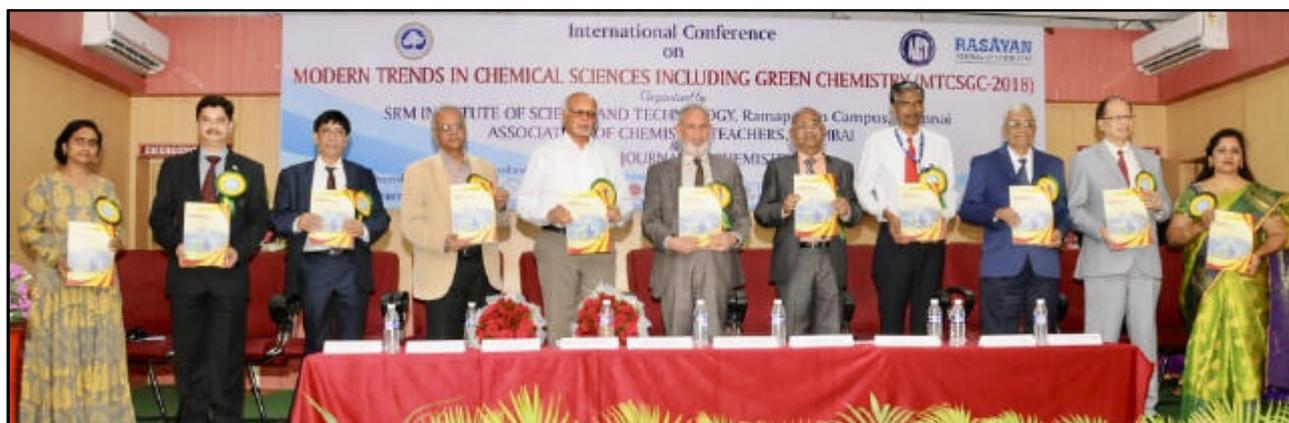
the best presentation and Dr. Machiraju was honoured as best presenter by the Eurasia Research Organizing Committee of the Conference.

## Report on International Chemistry Conference

SRM Institute of Science and Technology, Ramapuram Campus, Association of Chemistry Teachers (ACT), Mumbai and Rasayan Journal of Chemistry organized jointly an International Conference on “Modern Trends in Chemical Sciences Including Green Chemistry” during 27<sup>th</sup> to 29<sup>th</sup> December 2018. Around 200 delegates from all over the world actively participated in this mega event. Prof. D.V. Prabhu, General Secretary ACT and Prof. Helen P. Kavitha, Secretary ACT south zone acted as convenors. Dr. V. Subbiah Bharathi, Director, SRMIST Ramapuram welcomed the gathering. Dr. N. Sethuraman, Registrar, SRMIST delivered a special address.



The Chief Guest of the Inaugural function, Prof. K.N Ganesh, Director, IISER-Tirupati inaugurated the programme and in his inaugural address, he mentioned “Experiments are important to endear students to Chemistry”. The Guest of honor Prof. N. Sathyamurthy, President of Chemical Research Society of India and Prof. D.C. Deka, President of ACT addressed the gathering. Prof. K.N. Ganesh, delivered keynote address and Prof. N. Sathyamurthy, delivered a keynote lecture on “The Chemical Bond”.



There were five invited lectures on day one. Prof. Uday Maitra, IISc., Bengaluru delivered an invited talk on “*Teaching Organic Chemistry in the 21<sup>st</sup> Century*” and performed an interesting experiment. This was followed by Prof. S.B. Jonnalagadda, University of KwaZulu-Natal, Durban, South Africa who talked about “*Green Principles and Catalysis for Synthesis and Water Treatment*”.

Prof. R. K. Sharma, Green Chemistry Network, University of Delhi gave a talk on “*New Developments in Green Chemistry*” and Prof. Man Singh, Central University of Gujarat, Gandhinagar gave a talk on “*Friccohesity: Trend in Physicochemical Properties of Nanoemulsion*”. 25 research papers were presented by oral mode in parallel sessions on day one.

On day two, there were seven invited lectures on various topics. “*Synthesis of Carbon Nanotubes by Flame Fragments Deposition-Advantages and Disadvantages*” by Prof. Falah H. Hussein, University of Babylon, Iraq; “*Application of GCMS Technique for the Analysis of Narcotic Substances*” by Prof. G. Ramakrishnan, President, Chromatographic Society of India, Mumbai; “*Synthesis, Characterization and Application of Anti-Corrosive Polyurethane Coating from Date Seed Oil*” by

Prof. Priy Brat Dwivedi, Caledonian College of Engineering, Muscat, Oman; *“Towards a Vibrant Academia-Industry Synergy”* by Dr. Prabodh Chobe, Former Regional Director, IGNOU, Mumbai; *“International Science Olympiad programme-the harbinger of innovation in Science Education”* by Prof. D.V. Prabhu, General Secretary of ACT, Mumbai; *“Catalysis-An Inevitable and Vital Component of Green Chemistry”* by Prof. Radha V. Jayaram, Institute of Chemical Technology (ICT), Mumbai and *“Ion Chromatography and its Applications”* by Dr. Deepak Parab, Metrohm India Limited, Chennai.

25 oral and 30 poster presentations were held as parallel sessions. Cultural programme was also hosted and performed by SRM students in the evening.



The third day sessions started with poster presentations. 40 participants presented their research work in Poster mode. Dr. B. Sreedhar, ICT, Hyderabad delivered a talk on *“Nanoengineered Materials - Synthesis, Characterization and Catalytic Applications”*.

Prof. Sheshanath Bhosale, RMIT University, Melbourne, Australia delivered an invited talk on *“Supramolecular Chemistry: Organic Functional Structures at the Nanoscale Level”* followed by Prof. V. K. Garg, Centre for Environmental Science and Technology, Central University of Punjab, Bathinda who delivered a talk on *“Baseline Studies in the Vicinity of Proposed Nuclear Power Station”*.

Prof. Sanjay K. Sharma, JECRC University, Jaipur delivered talk on *“Greening the Chemistry Curriculum of K-12 Level: The Need of the Day”*. Final lecture was delivered on *“Studies in Irradiated UHMWPE Oxidation”* by Dr. Venkat Narayan, Anthara Technologies Consulting, Fort Wayne, USA.



The International Conference was concluded with the happy note with the Valedictory Function. Prof. Mangala Sundar K, Indian Institute of Technology, Chennai graced the Valedictory function as the Chief Guest and distributed Prizes and Certificates to the Best oral and poster presenters. Certificates were distributed to all the delegates and participants of MTCSGC 2018. Dr. S.K. Sharma, Editor, Rasayan Journal of Chemistry Received life time achievement award at the MTCSGC-2018.

## Report on RSC-ACT Workshop for School Teachers

Two Days Workshop on 'Experimental Chemistry for School Teachers' sponsored by Royal Society of Chemistry, and ACT was organized by Kalasalingam Academy of Research and Education, Krishnankoil, Tamilnadu State.

Dr. M. Swaminathan, EC member ACT and Emeritus, Professor of Chemistry coordinated the workshop and welcomed the teacher participants.

Inaugural function of workshop was presided by Dr. V. Vasudevan, Registrar, Kalasalingam Academy of research and education. Programme was inaugurated by Mr. R. Swaminathan, Chief Educational Officer, Virudhunagar.

Mrs. N. Padmavathy, Teacher developer from RSC explained and discussed the concepts of the content in three books of RSC given to the participants : Towards active learning, The particle nature of matter and Chemical reactions and equations.



The interesting part was the practical activities arranged for the teachers. They were very simple and easy to carry out. Teachers learned and enjoyed doing the experiments. This was followed by workshop on chemical reactions and equations.

Particle Nature of Matter was conducted through activities. During this workshop misconceptions in chemistry teaching learning process was clearly dealt with.

Dr. S. Balasubramanian, Secretary, RSC south zone briefed about the Yusuf Hamied Inspirational Chemistry Programme and detailed the use of RSC website for the teachers and students. All participants interacted and had fruitful discussion. There were 24 school teachers and 16 university teachers attended the workshop.

All the teachers gave a very good feedback about the workshop. Dr. C. Ramalingam, Dean of Advanced Science felicitated the teacher developer from RSC and secretary RSC south zone on behalf of the host institution. Prof. Gurusamy Pandian, Deputy Registrar and PRO delivered valedictory address and distributed the certificates.

RSC-ACT Chemistry training workshop was also organized at Dr. Rafiq Zakaria College for women, Aurangabad, Maharashtra State on 3-4, December 2018.

Dr. Mazahar Farooqui served as coordinator for the workshop and Prof. Brijesh Pare, Jawaharlal Nehru College, Ujjain and National coordinator RSC-ACT Chemistry workshop programme guided the event.

## Report on Science-Fest : Nirantar

Inter-house program Science, 'NIRANTAR' was organized jointly Isabella by the Thoburn College and ACT on 29<sup>th</sup> September 2018, at I.T. College, Lucknow.

The event began on an auspicious note with the lighting of the lamp by the Chief guest Dr. Mukul Das, Principal Scientist CSIR-IITR, Dr. E.S. Charles, President Isabella Thoburn College, Dr. V. Prakash, Principal, Dr. Seema Joshi, Head, Department of Chemistry and Ms. Seema Shukla, Student President C.C.I.T.C.



Dr. Joshi in her inaugural speech talked about the necessity of science in the daily lives and the impact of organizing science fests of the kind. She concluded her speech by encouraging august gathering to adopt a scientific temper to their critical appraisal of day to day problems. Chief Guest, Dr. Mukul Das spoke extensively about the evolution of scientific thoughts from a household milieu to an industrial scale and how a country's progress depended on it.



This fest proved to as one such opportunity for the students and teachers to come together and get charged by new pedagogical knowledge. To encourage student participation no registration fee was charged. In order to promote plantation saplings were gifted to the guests during their felicitation.

Valedictory ceremony began with the word of wisdom by the Chief Guest Prof. Shradha Sinha, B.B. Das NIT, Lucknow and Secretary ACT North zone, Isabella Thoburn College lifted the trophy of NIRANTAR'18 Science Champions, followed by J.N.P.G. College being the 1<sup>st</sup> runner up and Amity university, B.Sc., honours, bagged the 2<sup>nd</sup> runner up trophy. The day thus concluded with certificate distribution to winners of the respective events.

One of the focal points of the festival remained to reignite a passion for the sciences and critical thinking among students, with a tagline, 'A Quest Never at Rest'. Students have undergone unique activities that will cultivate scientific temper and encourage interest towards science.

## Report on National and International Conferences

ACT co-sponsored and supported the following academic activities organized at various venues.

National Conference on 'Advances in Science and Technology – an Interdisciplinary Approach,' was held 15 – 16, October 2018 at Sophia Girl's College, Ajmer, Rajasthan. Prof. N. S. Gajbhiye, Former Vice-Chancellor of BHU, Varanasi and H. S. Gaur University, Sagar was the Chief Guest.

Dr. Sr. Pearl, Principal of the college welcomed the gathering. Dr. (Mrs.) Taruna Sethi, Convener of the program, presented the theme of the conference. Dr. M. R. R. Prasad, Retd. Scientist, Vikram Sarabhai Space Centre, ISRO, Government of India gave the Keynote Lecture. Dr. Ashok K. Kakodia, co-convener presented the vote of thanks.



Wild Life week programme was organized on 16<sup>th</sup> October 2018 at B B Das NIIT, Lucknow by Dr. Shraddha Sinha, Secretary ACT North Zone.

International Conference on Chemical Sciences : National and global prerspectives was organised on 29-31 October 2018 at Christian PG College, Golagani, Lucknow by Dr. Renu Gupta, Head, Department of Chemistry, CPG College.

National Conferences on Advances in Biotechnology : an interdisciplinary approach was organised on 2-3 November 2018 at Shard University, Greater Noida, by Dr. Rita Singh Mazumdar. Dr. M.R.R. Prasad, Retd. Scientist ISRO, gave keynote address.

Training camp for Indian team to International Junior Science Olympiad was organised at HBCSE, Mumbai, during December 2018. Chemistry was a part of the training camp.



International Conference on 'Frontiers of Chemistry – Applied Sciences Interface' was organised on 21-22 December 2018 at University of Rajasthan, Jaipur by Dr. Mahesh Sharma.

## National Chemistry Day Celebrations

National Chemistry Day was Jointly Organized by Sant Gadge Baba Amravati University and ACT at Department of Chemistry, SGBA University, Amaravati on December 10, 2018.

Dr. V.S. Jamode, Former Pro Vice-Chancellor, SGBA University, Amravati was the Chief Guest and Dr. A.R. Raut, Institute of Science, Nagpur was the guest of honor. Dr. Jamode in his address said that in future chemistry is absolutely necessary because survival of our life, chemistry education helps to our whole development.

Prof. A.S. Aswar, Department of Chemistry, SGBA University, Amaravati was Chairperson. Dr. Aswar while guiding the students said in the changing situations, there are several challenges before us and in order to face these challenges new research and innovation should be the part of education. Therefore such types of educative events are very essential for overall development of students to face the competitions. Chemistry is a part of our life, without chemistry we cannot take breath and therefore every student must have basic knowledge in order to cope with the global competition.



Students were motivated by the speakers regarding the safety measures that should be taken while using and discarding Chemicals. Chemistry related activities such as chemistry quiz, Chem test, chemrangoli, debate competitions, scientific talks were arranged for students by Dr. J.M. Barabde.

Prizes were given to winners of the competitions. The program was well attended by PG., Research students and faculty members of the various departments of the University.



National Chemistry Day was organized jointly by Vidya Educational Institutions and ACT at the Conference hall of Seabreeze resorts, Chirala, AP state on December 10, 2018.

Dr. Mannam Krishnamurthy, EC Member ACT and Chief Executive Dean, Varsity Education Management Ltd. coordinated the celebrations. Revised version of 'language of chemistry' book was released and copies were distributed free to about 60 Andhra University Chemistry PG students alumni members.

The academic session was presided by Mr. N. Prakasa Rao, Chairman of Vidya Educational Institutions. Dr. P. Koteswara Rao, Principal, AP Council of Higher Education Colleges was the chief guest, who spoke on the importance of chemistry education.

Dr. D. Srinivas, S.S. Bhatnagar Fellow, NCL, Pune gave an invited talk on 'Recent Advances in Chemical Catalysis'. Dr. M. Krishnamurthy, Director, A. N. University Research Centre, Nagaram gave a presentation on 'Use of Soaps and Detergents in Day to Day Life'.

Dr. J. Satyanarayana, DGM (Retd.), IOC, Mumbai and Dr. M. I. S. Sastry, Chief Research Manager (Retd.), IOC, Faridabad interacted with participants by sharing their knowledge on hydrocarbons.

Mrs. M. Usha Rani, Vice-principal, BSF School, Chiruli, Madhya Pradesh also participated as guest and addressed school children of Vidya Educational Institutions.



National Chemistry Day was organized at Academic Heights Public School, Morena, Madhya Pradesh state, in collaboration with ACT, on 10<sup>th</sup> December 2018.

On this occasion a chemistry quiz, a seminar and an Essay competition was conducted for the students of class 6<sup>th</sup> to 10<sup>th</sup>. The chief guest, Director of the school, Mr. Umendra Agarwal and Dr. Umesh Chandra Jain inaugurated the event.



A seminar was also conducted, 'On the role of chemistry in our day to day life' as a part of the National Chemistry Day celebrations. Dr. Umesh Chandra Jain, Principal C.P. International School, Farrukhad and EC Member ACT delivered a lecture on importance of chemistry in our daily life.

Mr. Rabindra Mishra conducted a digital quiz in which about 150 school students participated. Best performances on the essay writing and quiz were recognized. Mr. Brijesh Agarwal coordinated the chemistry day celebrations and prizes were distributed.

## Scientists Agree to Redefine 'Kilogram'

The kilogram will no longer be measured against an actual weight, after scientists voted to start using an electromagnetic current.

Since 1889, a kilogram has been defined by a single lump of platinum-iridium which is housed inside three glass bell jars at the headquarters of the International Bureau of Weights and Measures (BIPM), just outside Paris. But the master copy, known as 'Le Grand K', has been picking up microparticles of dust, or losing mass in cleaning, causing consternation for scientists using it to measure ever more accurate weights.

Now, after a week-long meeting at the Palace of Versailles representatives of 60 Nations agreed to redefine the kilogram based on the unchanging value of the 'Planck constant.' Instead of checking it against an actual weight, scientists can now find an exact kilogram by measuring the amount of electricity needed to lift it, using a special set of scales known as The Kibble balance.



Scientists have been trying for decades to define a constant value for the kilogram that is derived from laws of physics, in the same way they have done for other standard units. For example, a meter is not defined as 100 centimeters but 'the length of the path travelled by light in a vacuum during a time interval of 1/299,792,458 of a second.'

Describing what impact the new kilogram would have, the BIPM said: 'In the same way that if you replaced the decaying foundations of a house with robust new ones, it may not be possible to identify the difference from the surface, but some substantial changes would have taken place to ensure the longevity of the property.'

The BIPM also voted to update definitions for the ampere (electrical current), the Kelvin (thermodynamic temperature) and the mole (amount of a substance).

'Using the fundamental constants we observe in nature as a foundation for important concepts such as mass and time means that we have a stable foundation from which to advance our scientific understanding, develop new technologies and address some of society's greatest challenges.'

Barry Inglis, who heads the committee for weights and measures, said the implications were immense. 'We will now no longer be bound by the limitations of objects in our measurement of the world, but have universally accessible units that can pave the way to even greater accuracy, and even accelerate scientific advancement,' he said.

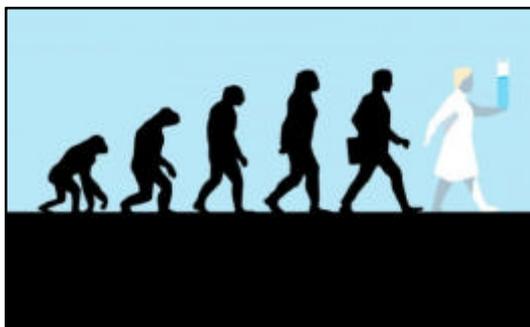
The new definitions agreed by the BIPM will come into force on May 20, 2019.

(Source: The Telegraph, November 2018)

## Views, News and more ....

### The 2018 Chemistry Laureates

The Nobel Prize in Chemistry 2018 was awarded with one half to Frances H. Arnold 'for the directed evolution of enzymes' and the other half jointly to George P. Smith and Sir Gregory P. Winter 'for the phage display of peptides and antibodies.'



This year's Nobel Laureates have been inspired by the power of evolution and used the same principles – genetic change and selection – to develop proteins that solve humankind's chemical problems.

### New Lithium ion Battery

Researchers at Indian Institute of Technology, Hyderabad prepared lithium ion battery, which is twice powerful compared to the existing. These batteries contain negative and positive electrodes, which can transform opposite in the absence of changing.

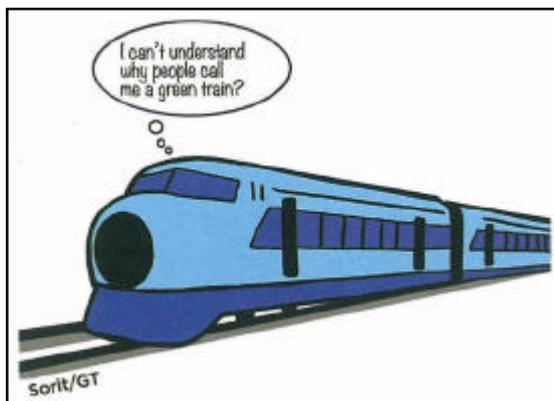
These new batteries will be more useful and eco-friendly with the increased demand of electrical vehicles.

### Pink Diamond, Rs. 363 Cr Worth

A pink diamond has created new attraction in the world. The 19 carats diamond, has a weight of 3.8 grams and was auctioned recently in Geneva, Switzerland for about 50 million US dollars. It was believed that the pink diamond was acquired in 1920 and was suitably polished in recent times.



### World first hydrogen-powered green train



Germany has launched the world's first hydrogen-powered train because diesel-operated trains cause a lot of pollution. Built by French train make Alstom, two trains painted in bright blue colour now operate on a 1.6 km stretch in northern Germany.

Hydrogen trains are eco-friendly because they are equipped with fuel cells that produce electricity through a combination of hydrogen and oxygen, a process that leaves steam and water as the only emissions. Excess energy is stored in ion lithium batteries on board.

## Petroleum from Carbondioxide

It was a known fact that the green leaves absorb carbonmonoxide for photosynthesis and release oxygen to the atmosphere. Recently scientists of University of Illinois, USA synthesis artificial green leaves. These leaves are also able to convert carbondioxide to sugars and the sugars are further converted to petroleum.

Leaves of 1.7 m long and 0.2 m wide were reported to be used for the production of petroleum in ACs sustainable Chemistry and Engineering Journal. The eco-friendly nature of these synthetic leaves is that they could reduce carbondioxide content of the atmosphere by 10% and thus contributes to decrease 'global warming'.



## Making water from air

David Hertz, having learned that under the right conditions you really can make your own water out of thin air, put a little contraption on the roof of his office and began cranking out free bottles of H<sub>2</sub>O for anyone who wanted one.

Soon he and his wife, Laura Doss Hertz, were thinking bigger – so much so that this week the couple won the \$1.5 million X Prize for Water Abundance. They prevailed by developing a system that uses shipping containers, woodchips and other detritus to produce as much as 2,000 litres of water a day at a cost of no more than 2 cents a litre.

The X Prize competition, created by a group of philanthropists, entrepreneurs and others, has awarded more than \$140 million over the years for what it calls audacious futuristic ideas aimed at protecting and improving the planet.

## Plastic Contamination in Salt



Research investigations from the Center for Environmental Science and Engineering, I.I.T. Bombay revealed that microplastics and microfibers are present to the extent of about 64 micrograms in each kilogram of salt derived from sea water.

Many samples were analysed from the salt sources of Gujarat, Maharashtra, Goa and Kerala. The composition of microplastics was formed as 61% polysters, 22% polythene and 17% polyamides.

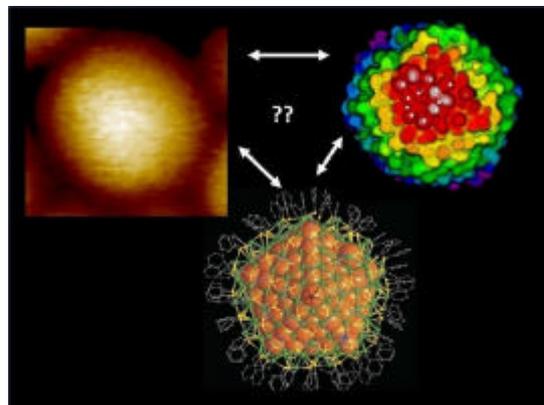
## Neuroprotective Agents from Natural Products

The health impact of neurodegenerative diseases is becoming more significant as life expectancy in human populations continues to increase. The search for novel therapeutic agents effective in different neurodegenerative conditions has thus intensified over the last two decades. A number of textbooks have also been published about the topic.

## High-resolution imaging of nanoparticles structures

Using scanning tunnelling microscopy (STM), extremely high resolution imaging of the molecule-covered surface structures of silver nanoparticles is possible, even down to the recognition of individual parts of the molecules protecting the surface. This was the finding of joint research between China and Finland.

Studying the surface structures of nanoparticles at atomic resolution is vital to understanding the chemical properties of their structures, molecular interactions and the functioning of particles in their environments. Experimental research on surface structures has long involved imaging techniques suitable for nanometer-level resolution, the most common of which are based on electron tunnelling, the above mentioned scanning tunnelling microscopy and atomic force microscopy based on the measurement of small, atomic-scale forces.



The researchers used previously characterised silver nanoparticles, with a known atomic structure. The metal core of the particles has 374 silver atoms and the surface is protected by a set of 113 TBTT molecules. TBTT (tert-butyl-benzene thiol) is a molecule with three separate carbon groups on its end. The particle's outer surface has a total of 339 such groups. When this type of nano-particle sample was imaged at low temperatures in the STM experiment, clear sequential modulations were observed in the tunnelling current formed by the image.

## One thinking and two solutions

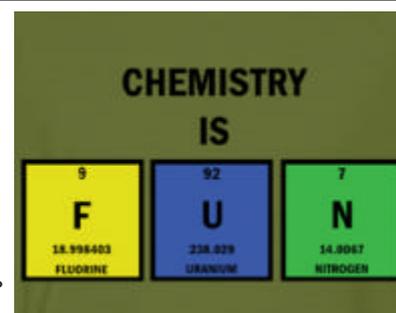


The outer skin of oranges is a common waste. However a 23 years young Sarav Kumar, studied of IIT Dhanbad thought it different and successful in preparing toilet cleaner.

These toilet cleaners were tested in Jharkand State. Public Toilets at Jamshedpur city created newer history with lower cost of maintenance and pleasant 'aroma'.

The 'single thought' has provided two good solutions; one solution is on the 'bad odour of toilets' and another solution is on the disposal of 'orange waste'. The outcome is just like an English slogan, 'one shot and two birds'.

[We conclude the present issue of the ACT News Letter here](#) 



# ASSOCIATION OF CHEMISTRY TEACHERS

(Promoting Excellence in Chemistry Education)

c/o. Homi Bhabha Centre for Science Education (HBCSE, TIFR)

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*Congratulations*



The Indian Team won Five Gold Medals and One Silver Medal at the International Junior Science Olympiad Competitions held at Botswana, December 2018.

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