



ASSOCIATION OF CHEMISTRY TEACHERS NEWS LETTER

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Association of Chemistry Teachers News Letter, January–April, 2020

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From the Editorial Desk..

Dr. Mannam Krishna Murthy, Editor
Varsity Education Management Ltd, Hyderabad

We are bringing in the present issue of the news letter with the reports on new trends in chemistry, innovations in chemistry and chemistry news.

We have included important chemistry events of the year 2019 and five general articles in the present issue. We have also included reports on CONTECH 2019-20, National Science Day Celebrations, International and National Chemistry events.

Chemical understanding, prospectives and measures of the present Global health problem COVID-19 were also presented in this issue.

We request you to participate in activities related to the completion of 20 years of starting ACT and make a grand success.

We invite good suggestions and better contributions to get best output of the future issues of ACT News Letter.

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

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President's Communique



Prof. Brijesh Pare

Its great pleasure to be on board as President of ACT. I have been associated with ACT since 2002 and since then working to the best of ability for the chemistry popularization under the patronage of many stalwarts of chemistry. ACT is a strong group of 2500 members and it's the only association in India for Chemistry teachers from School, College and Universities along with active chemists from Industries and leading premier scientific institutions. ACT has a mandate to popularize chemistry among young Indian students by organizing various workshops and conferences across India through its six zonal units. ACT has been successfully doing Olympiad stage I leading to IchO, Concept test for UG students, annual convention of chemistry teachers, chemistry popularization workshops, International Chemistry education workshops etc.

Its understandable that ACT News Letter should reflect the real active face of ACT to its members and others. Moreover, within the ACT we are keen and optimistic to get this very news letter transformed into a popular Chemical Education Journal in the years to come. I wish the editorial board for the successful release of this issue.

Executive Council Meet at HBCSE

First ACT EC meet of 2020 was held at Homi Bhabha Centre for Science Education, Mumbai on 29th February 2020, under the chairmanship of Prof. Brijesh Pare, President, ACT. Prof. D.V. Prabu, General Secretary ACT read out the minutes of second EC meet of 2019 held at SGB Amravati University on 5 December 2019. The minutes were accepted and passed. A report of ACT activities conducted till date was also presented.



Dr. S.P. Singh, National Coordinator, ACT-CONTECH presented a report of the concept test in chemistry for UG students for the year 2019-20. It was proposed to organize a National Conference in Chemistry, in each of the six zones. Workshops on Chemistry experimentation were also suggested to organize. A commemorative souvenir was proposed to bring out on the occasion of the 20th Year of ACT. A six member souvenir committee was constituted, Dr. U.C. Jain as convenor. Dr. Raakhi Gupta was requested to prepare a proposal of organizing a two day workshop on Research Methodology and Scientific Writing. It was also proposed to organize collaborative activities with CBSE and Prof. Brijesh Pare was requested to send the proposals to CBSE.

The editorial board of ACT News Letter for 2020-22 was constituted. Dr. Mannam Krishna Murthy will be the Chief Editor, with fourteen experienced teachers in the advisory board.

Spectrum of Activities of ACT Members

Dr. Manam Krishna Murthy, Secretary, ACT South Zone from Varsity Education Management Limited, Hyderabad delivered key-note address at UGC National Workshop on 'Chromatographic Methods' organized by A.G. & S.G.S. College, Vuyyuru, A.P. State on 3, January 2020.

Prof. V.P. Singh, Vice-president, ACT Central Zone from Regional Institute of Education, Ajmir acted as Vice chairperson of National Resource Group for training programme of teachers, organized by NCERT, New Delhi on 15, January 2020.

Dr. S.P. Singh, Secretary ACT East Zone from A.N. College, Patna acted as Expert Tele counsellor in chemistry for Bihar School Board Class XII Students, organized by daily News Paper 'Dainik Jagran' on 16, January 2020.

Prof. D.C. Deka, Past president of ACT and Vice chancellor Mahabdev University was the chief guest at the Nature Study Camp at Jarabari, organized jointly by Vigyan Prasara, New Delhi and Assam Science Society on 3, February 2020.

Dr. W.B. Gurnule, Secretary ACT Central Zone from Kamala Nehru Mahavidyalaya, Nagpur, delivered an invited talk at the International Conference on Advancement in Polymeric Materials, organized by CIPET, Bangalore on 13-15, February 2020.

Dr. M.R.R. Prasad, ACT Life member and Retd. Scientist from ISRO, Tiruvananthapuram was recognized under Quarterly Franklin Membership by London Journals Press, UK on 19, February 2020.

Prof. Brijesh Pare, President ACT from Madhav Science PG College, Ujjain delivered key-note address at Annual Goa Chemistry Association Convention on 22, February 2020.

Prof. Md. Abdul Halim Shah, ACT EC member from D.M. College of Science, Imphal delivered an invited talk at the International Conference on New Frontiers in Engineering and Science, organized by Gauhati University on 22-23, February 2020.

Prof. Sraddha Sinha, Vice-president ACT North Zone from BB Das NIT, Lucknow participated in the International Conference on 'Current Trends in Pharmaceutical and Medical Sciences', organised at GIPER Kashipur, Uttarakhand on 26-29, February 2020.

Prof. M.V. Basaveswara Rao, ACT Life member from Krishna University P.G. Centre, Nuzvid participated as chief guest at the 'Expert Lecture Programs and Opportunities in Toxicology', organized by A.P. Academy of Sciences at Bapatla College of Pharmacy on 27, February 2020.

Prof. K. Sudhakar Babu, ACT Life member from S.K. University acted as chief guest at the National Science Day celebrations, organized by Sri Chaitanya Techno School at Ananthapur on 28, February 2020.

Prof. Sudha Jain, Former President ACT organized celebrations on the National Science Day at G.S.R.M. Memorial P.G. College, Lucknow on 28, February 2020.

Prof. P.M. Mishra, Vice-president ACT East Zone from M.L.S.M. College, Darbhanga started taking online chemistry classes via social media. PM Narendra Modi's 'Mann Ki Baat' updated this as inspiring example on 18, March 2020.

Prof. M. Swaminathan, EC member ACT acted as resource person for the one day Workshop and Hands on Training in Photodegradation, organised by Kalasalingam Academy of Research and Education, Krishnankoil, Tamilnadu State on 21, March 2020.

Mr. V. Kumar, Life member ACT from Sri Chaitanya Educational Institutions, Hyderabad coordinated free teaching classes and student interaction to NEET aspirants two hours every day, in view of lockdown, through Raj News TV during 4 to 30 April, 2020.

The Year 2019 in Chemistry

Biggest stories of Chemistry, chemistry education, research and innovations in chemistry, in the year 2019 are briefly compiled

INTERNATIONAL YEAR OF THE PERIODIC TABLE



2019 saw celebrations to mark the 150th anniversary of Dmitri Mendeleev's periodic table. The year saw the oldest classroom periodic table uncovered, and the smallest and largest ever tables assembled.

EBOLA VACCINE APPROVED AND IN PRODUCTION



A new vaccine for Ebola was approved in Europe after successfully undergoing clinical trials. A ruling on the vaccine's US approval is expected in March, with the vaccine available from late 2020.

LITHIUM-ION BATTERIES WIN NOBEL PRIZE



The Nobel Prize in chemistry was awarded to the development of lithium-ion batteries that power phones, computers, and more. One winner, John B Goodenough, became the oldest ever Nobel Prize winner at 97.

FURTHER EVIDENCE FOR PERIODICITY BREAKDOWN



New calculations show that copernicium is a highly volatile 'noble liquid', and oganesson is a metallic semiconductor. It's further evidence for the breakdown of periodicity for the superheavy elements.

A NEW RING FORM OF ELEMENTAL CARBON



Chemists created a new form of elemental carbon: a ring consisting solely of 18 carbon atoms. Meanwhile, a new algorithm suggests there could be 43 different forms of carbon yet to be discovered.

REDUCING & CONVERTING CO₂ EMISSIONS



Chemists trialed ways to reduce carbon dioxide emissions. A battery-like device can capture CO₂ emissions in car exhausts, while a copper catalyst converts CO₂ from the atmosphere into useful chemicals.

STIR BAR CONTAMINATION CATALYSES REACTIONS



The magnetic stir bars used in many laboratories are coated in an inert polymer. However, new research shows that scratches and cracks could trap metal particles, which could then interfere with reactions.

ALZHEIMER'S DRUG TRIALS UNSUCCESSFUL



Clinical trials on Alzheimer's drug elenbecestat were halted, making it the sixth Alzheimer's drug of its type to enter but fail clinical trials. Results of trials for other drugs are expected in the coming years.

STRANGE BONDS IDENTIFIED IN SPACE



The helium hydride ion was detected for the first time in a nebula, while calculations suggest that reactions between ammonia and hydrogen could produce nitrogen heptahydride on Neptune and Uranus.

CONVERTING PLASTICS INTO NEW MATERIALS



One new process converts a plastic used in food and drinks packaging into jet fuel, while another transformed polyethylene into lubricants. A new family of recyclable polymers was also discovered.

FLUORINATED COMPOUNDS UNDER SCRUTINY



Concerns relating to polyfluorinated compounds hit the news regularly in 2019. Denmark banned their use in food packaging, while chemists worked on ways to remove them from contaminated water.

LUNG INJURIES HEIGHTEN VAPING CONCERNS



Over 2,500 people were hospitalised in the U.S. with lung injuries associated with vaping, with 54 deaths. The cause of the issues was attributed to vitamin E acetate in THC-containing vaping products.

Useful Basics of Chemical Toxicity

Dr. Mannam Krishna Murthy

Chief Executive Dean

Varsity Education Management Ltd., Hyderabad.









Laboratory courses in chemistry are usually an integral part of the school curriculum. Students are introduced to many useful experiments. These experiences lend utility not only in future chemistry pursuits but in many other situations. Since it is important that individuals should have very sound knowledge on the hazards that chemicals are capable of posing when they are not handled carefully, it might be helpful to allow more emphasis on chemical toxicity.

More importance is to be given at the school children, for whom education is compulsory, the children who subsequently go on to become responsible citizens of any society will have a sound knowledge of the nature of chemicals and will be in a far better position to manage and protect our fragile environment. The extent to which damage can be done to an entire organism or to a substructure of an organism by another substance is toxicity. The toxicity of any substance is dose-dependent and an over-dose of any substance including water can have detrimental effects.

All substances around us can become toxic above a permissible limit. However, the impact of chemicals is more pronounced and therefore needs to be addressed as a separate issue. Chemicals which have high levels of toxicity are capable of causing severe health impairment and can even be responsible for diseases like cancer and cause disorders of various internal organs including the nervous system. If these chemicals are not easily biodegradable, they persist in the environment and travel along the food chain, thereby effecting people who would have otherwise not come in contact with the chemical.

Chemicals also can irritate the skin, eyes, nose and throat. Some chemicals pose significant safety hazards, such as fire or explosion risks. The extent of poisoning caused by a chemical is influenced by the quantity that has entered and also the route of entry, in addition to the inherent toxicity of the chemical. With thousands of chemicals in commercial use today, it has become very important for all individuals to have some information regarding the hazards posed by chemicals.

<p>Chemicals such as paint thinner; laboratory solvents (acetone, alcohols, acetic acid, hexane); and even some adhesives fall under the category of flammable or explosive substances. They may be liquids or gases or sometimes even solids. They can catch fire rapidly and burn.</p>	<p>They are indicated by the symbols:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <i>Flammable</i> </div> <div style="text-align: center;">  <i>Explosive</i> </div> </div>
<p>Corrosive substances are those which can destroy or living tissue or corrode materials, such as metals or even glass at times. Strong acids and strong bases, oxidants and dehydrating agents come under this category.</p>	<p>They are indicated by the symbols:</p> <div style="text-align: center;">  </div>
<p>Some chemicals react violently or even explosively in presence of heat, light, water or even air. Examples include nitrates, nitrites, peroxide and alkali metals. They are usually called oxidizers.</p>	<p>They are indicated by the symbol</p> <div style="text-align: center;">  </div>
<p>Poisonous substances are those which can cause harm to body and even death when ingested. Chemicals such as cyanide, mercury, arsenic and methanol are poisonous.</p>	<p>They are indicated by the symbol</p> <div style="text-align: center;">  </div>
<p>Radioactive substances such as isotopes of cobalt and uranium. These substances are capable of emitting radiations like alpha, beta and gamma.</p>	<p>They are indicated by the symbol</p> <div style="text-align: center;">  </div>

Before handling any chemical the details given on the label of the container should be properly read and the necessary precautions taken.

Table : List of some chemicals and respective hazards

Chemical	Relevant Hazard
Acetic Anhydride	Poison (on inhalation and ingestion); Irritant (respiratory, skin, eyes); Violent reaction with many compounds.
Acetonitrile	Toxic (on inhalation, ingestion, and absorbance through skin)
Aluminum Chloride (anhydrous)	Violent reaction with water
Ammonia (gas)	Corrosive, Irritant (skin, eyes, respiratory)
Ammonium Dichromate	Oxidizer; poison (on inhalation and absorbance through skin); carcinogen
Ammonium Nitrate	Oxidizer; forms explosive mixtures with hydrocarbons
Ammonium Vanadate	Poison (on inhalation and ingestion)
Aniline	Poison (on inhalation and absorbed by skin); Irritant (eye, skin)
Benzene	Carcinogen
Carbon Disulfide	Extremely flammable; Acute peripheral toxin; reproductive toxin
Carbon Monoxide	Poison; Toxic
Carbon Tetrachloride	Carcinogen. Acute renal hepatotoxin
Chlorine	Oxidizer, corrosive; irritant (on inhalation); poison (on inhalation).
Chloroform	Sedative; Carcinogen
Chromic Acid (hexavalent chromium)	Carcinogen
2,4-Dinitrophenylhydrazine	Explosive
Formaldehyde (formalin)	Carcinogen
Hydrazine	Powerful reducing agent; explosive; corrosive; carcinogen
Hydrofluoric Acid (solutions with HF)	Corrosive; Fatal if inhaled or ingested (liquid and vapor can cause severe burns, not always immediately painful, but possibly fatal)
Hydrogen Bromide (anhydrous)	Poison (on inhalation); corrosive
Hydrogen Chloride (anhydrous)	Poison (on inhalation); corrosive
Lead Carbonate	Poison (on inhalation and ingestion)
Nitrobenzene	Poison (on inhalation, ingestion, and absorbance through skin)
Silver Nitrate	Oxidizer; corrosive; may be fatal if ingested; poison (on ingestion); incompatible with many compounds
Styrene	Irritation to skin, eyes and upper respiratory track
Tetrahydrofuran	Forms explosive peroxides
Thionyl Chloride	Violent reaction with water; corrosive; poison (on ingestion)
Trinitrophenol (picric acid)	Poison (on ingestion); irritant (skin, eye), allergen; unstable and explosive when dry

If knowledge of chemical toxicity is spread among all members of society, it may be much easier to work towards pollution prevention through community mobilization and in this effort, children may be most important.

References : 1. Reducing Risks to Students www.acs.org/chemicalsafety/reducingrisks

2. Journal of Applicable Chemistry, 2 (2013), 1409

Awareness of Chemical Constituents in Food

Tushita Rawat

Source: Down to Earth, Feb.2020

Improving awareness among consumers of food high in fat, salt and sugar is a must. All we need is reliable information.

CSE's lab report

The Environment Monitoring Laboratory of Delhi-based non-profit Centre for Science and Environment (CSE) recently conducted test to find out about the nutritional value of ingredients used in many popular fast food items. From chips, soup, burgers to sandwich, the findings of the lab alert us to some alarming facts about the impact of such food on its consumers.



What harm could the ordinary chips and namkeens possibly do? Quite a lot, as it turns out. All the major brands of potato chips and namkeen tested in the lab were high in salt and/or fat. They account for nearly 1/4th of the daily salt intake, besides containing the harmful trans fat that can increase the risk of heart diseases. While some of these companies don't mention the amount of salt and fats in the food, others shy away from sharing the complete truth when they do mention the contents of the product at the back. For example, *Ching's Secret Schezwan* mentions only half the amount of what it contains on its label. A nutritional crisis is underway in the country with children as its primary victims. What children are majority consuming is not just low on the nutritional value but it is also the root of many diseases like high blood pressure, high cholesterol, diabetes and obesity.

What needs to be done

The discourse on how fast and packaged food items affect our health has been around for quite some time now. Advertisements of these products typically feature celebrities, including movie stars and sports personalities. Add to this the selective information shared with customers about the nutritional value of the products and it is next to impossible to escape the culture of fast food prevailing in the country, especially when it comes at an affordable price.

This is why stringent food labeling laws and effective implementation are necessary to break this pervasive culture. In 2013, India food regulatory authority, the Food Safety and Standards Authority of India (FSSAI) set up a committee to design strict guidelines on the availability of junk food in the around schools. After multiple revisions and redrafting, FSSAI finally released a guideline draft in 2019. The 2019 guidelines prohibit the sale and promotion of food high in fat, salt and sugar, or HFSS foods, within 50 metres of a school. It also bans handing out free samples of HFSS foods and the sponsoring of school events by companies that manufacture these items.

While the ban is a positive step towards tackling the junk food menace, improving awareness among customers by sharing reliable information with them is the need of the hour. Simultaneously, we also need strict laws to prevent companies from manipulating data. These simple measures would go a long way in checking the vicious culture of unhealthy eating habits where home-cooked food takes a backseat.

The word “fast” has come to define modern living, but it’s high time we reconsider its association with the food we eat.



The Centre for Science and Environment (CSE) laboratory tested 33 food products – 14 packaged foods and 19 fast foods – for salt, fat, trans fat and carbohydrates. Alarming levels of salt and fat were found in some of our favourite food items like chips, fries, burgers and pizzas.

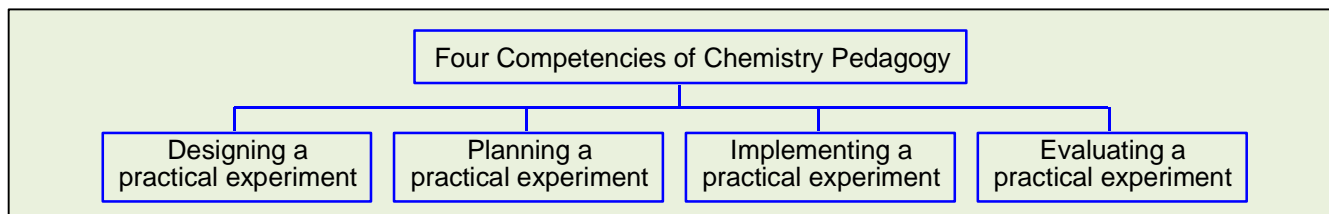
Effective Pedagogy in Chemistry

Dr. Yogendra Kumar Kothari

Govt. Excellence Higher Secondary School, Madhavnagar,
Ujjain, Madhya Pradesh.



Chemistry is a mother of all sciences. Chemistry is an interesting subject, but some students and teachers think it is complex and difficult. People even say that Chemistry is a tough and boring subject as compared to Physics and Mathematics. Most of the students' feel Chemical formula of the compounds, Chemical equations, and Organic Chemistry are very boring therefore do not take interest in the subject. This also proves that teaching a subject such as Chemistry is always challenging and often is a tough task for the teachers. However, by adopting some innovative teaching methodology (called Chemistry Pedagogy), chemistry can be made very interesting.



Chemistry pedagogy must be effective, communicative, focusing towards skill development, should create interest, enhance understanding of the concepts, and should motivate students to explore knowledge by themselves. This way students can fall in love with chemistry and chemistry teachers. We all are aware that in the context of relationships, chemistry is a simple 'emotion' that two people get when they share a special connection.

Once the above platform is set, students will love to explore the world of chemistry and as an innovative teacher you must add wings to the expectations of students through effective teaching methods that facilitate students' active participation.

The modern world in which we live in is a digital era. Most of the students and teachers are equipped with smart phones. Many of them have easy access to internet facilities. Hence, one can believe lots of advancements and privileges of this digital era are in students' fist. It is quintessential for the teachers to make sure students are using them wisely and are aware of the latest technological updates. Today's digitally boosted education system focuses a lot on student's engagement and active participation during the classroom. Hence, being an innovative teacher, we must use effective and innovative teaching methods that facilitate students' active participation.

Effective pedagogies involve a range of techniques, including whole-class and structured group work, guided learning, and individual activities. Effective pedagogies focus on developing higher order thinking skills and metacognition among students. It has been observed that the more students friendly the pedagogies are, it would enhance mental and physical balance of the students and will keep them happy and organized in their life.

Some Simple Examples of Pedagogies

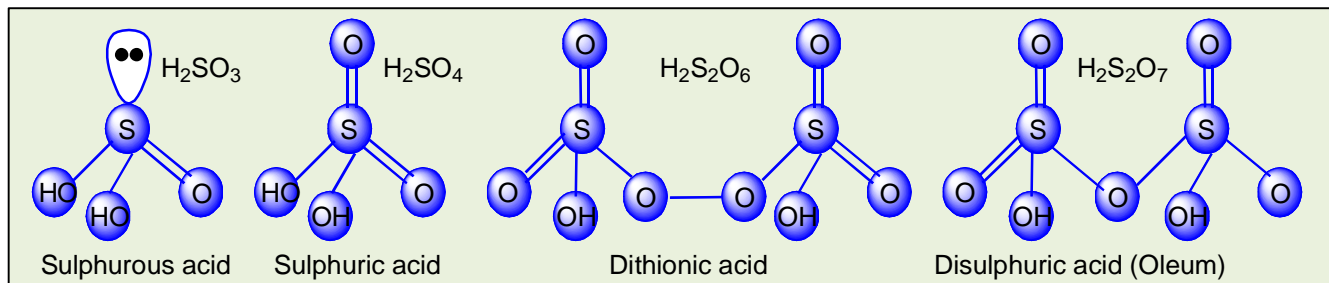
Chemistry as a Fun : In regular classroom teachers can demonstrate concepts using chemistry experiments. It is general tendency of humans that whatever they see or is shown to them, they tend to memorize or remember it for a longer period. This also helps students to enjoy during the classroom and learn with fun. Examples are : Colorless to pink color ; Fire - Reaction between KMnO_4 and Glycerin ; Fizzy Bubbles - Reaction between Lime Juice and Sodium bicarbonate.

Cards of Elements : The overall idea is to prepare a card of each element which contains information about element symbols, atomic number, atomic mass etc. By using these cards, students can easily understand elements and their symbols.

Creating/Making a periodic table : With the help of element cards prepared above, students choose a group and prepare periodic table with cards Schlumberger-Private.

Making formula : With the help of cation and anion cards, students can prepare a chemical formula of the resultant compound.

Structural formula of oxy acid : To understand the 3-Dimensional structure of oxy acids, students can prepare models.



Concept of orbital by Balloon : Visualization of the concept of s, p, and d orbitals by balloon can intrigue students very much. This helps in strong foundation of the concepts.

By Video : Videos are excellent tools of teaching. Videos related to Science and Chemistry are very helpful for students as it gives them a good gut feeling on grasping of the concepts. They can jot down the notes from videos and use them to prepare for the examinations.

By Cartoon : With the help of cartoons, we can explain the nature of various gases like H_2 , N_2 , HCl , Cl_2 and NH_3 . Eventually, you can use some off the way tips and methods to make chemistry easy for your students.

By Model : Geometry and Hybridization of molecules like $BeCl_2$, H_2O , NH_3 , CH_4 etc are explained by model of molecules.

By Power Point presentations : The best way of getting students excited in chemistry is by presenting it in a dynamic manner. Instructors should present the lectures with the combination of boards and audio-visual aids such as PowerPoint slides and videos etc. that makes chemistry more alive and real to the students as our millennium students are mostly visual learners due to the image-centric, visual world in which they are raised. Students grasp the concepts better if they can picture them.

Chemistry in Everyday life : Chemistry touches all aspects of our lives. An experienced instructor can connect the depth of the science of chemistry with its every-day-life importance. For example: we are surrounded by the usage of chemicals in our daily routine: Toothpaste ; Salt ; Soap ; Detergents etc.

Use of Apps : Teaching job is also changing its texture according to enhancement in technology. Many apps and software are easing the load of the teaching profession, so you should also adopt the modern techniques that can help you to convey your learning easily to your students. These apps help students.

Lab Report as an Assignment : Laboratories are an essential part of chemistry teaching. It gives students an opportunity to be used to chemicals and understand their working and reactions. Therefore, asking students to submit lab report as an assignment will help them a lot in developing solid concepts.

By Seminar : Teacher should make classroom duration highly interactive. One way is to organize seminars in class itself to give change to enhance their vocal skills, confidence, and help them in overall development. This helps in solid development of concepts among students.

Playlists and videos : <https://www.youtube.com/c/yogendrakothonari/playlists>

Chemical Prospectives of Corona

By Johns Hopkins Univ.

Harvard University, Cambridge, USA

The corona virus is not a living organism, but a protein molecule (RNA) covered by a protective layer of lipid (fat), which, when absorbed by the cells of the ocular, nasal or buccal mucosa, changes their genetic code (mutation) and convert them into aggressor and multiplier cells.

Since the virus is not a living organism but a protein molecule, it is not killed, but decays on its own. The disintegration time depends on the temperature, humidity and type of material where it lies.

The virus is very fragile; the only thing that protects it is a thin outer layer of fat. That is why any soap or detergent is the best remedy, because the foam cuts the fat (that is why you have to rub so much: for 20 seconds or more, to make a lot of foam). By dissolving the fat layer, the protein molecule disperses and breaks down on its own.

Heat melts fat; this is why it is so good to use water above 25 degrees Celsius for washing hands, clothes and everything. In addition, hot water makes more foam and that makes it even more useful.

Alcohol or any mixture with alcohol over 65% dissolves any fat, especially the external lipid layer of the virus. Any mix with 1 part bleach and 5 parts water directly dissolves the protein, breaks it down from the inside.

Oxygenated water helps long after soap, alcohol and chlorine. Peroxide dissolves the virus protein, but you have to use it pure and it hurts your skin.

The virus is not a living organism like bacteria; they cannot kill what is not alive with antibiotics, but quickly disintegrate its structure with everything said. Never shake used or unused clothing, sheets or cloth. While it is glued to a porous surface, it is very inert and disintegrates only between 3 hours (fabric and porous); 4 hours (copper, because it is naturally antiseptic and wood, because it removes all the moisture and does not let it peel off and disintegrates); 24 hours (cardboard); 42 hours (metal) and 72 hours (plastic). But if you shake it or use a feather duster, the virus molecules float in the air for up to 3 hours and can lodge in your nose.

The virus molecules remain very stable in external cold, or artificial as air conditioners in houses and cars. They also need moisture to stay stable and especially darkness. Therefore, dehumidified, dry, warm and bright environments will degrade it faster.

UV light on any object that may contain it breaks down the virus protein. For example, to disinfect and reuse a mask is perfect. Be careful, it also breaks down collagen (which is protein) in the skin, eventually causing wrinkles and skin cancer.

The virus cannot go through healthy skin.

Vinegar is not useful because it does not break down the protective layer of fat. No spirits, Nor Vodka, serve. The strongest vodka is 40% alcohol, and you need 65%. Listerine if it serves! It is 65% alcohol.

The more confined the space, the more concentration of the virus there can be. The more open or naturally ventilated, the less. This is super said, but you have to wash your hands before and after touching mucosa, food, locks, knobs, switches, remote control, cell phone, watches, computers, desks, TV, etc. and when using the bathroom.

You have to humidify hands dry from so much washing them, because the molecules can hide in the micro cracks. The thicker the moisturizer, the better is the result. Also keep your nails short so that the virus does not hide there.



The Earnest Trials to Find a Medicative Cure for COVID-19

Dr. Amrit Krishna Mitra

Government General Degree College, Singur,
Hooghly, West Bengal



Humanity in Crisis

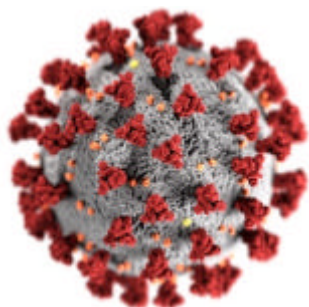
For the past few months, we have seen many people lose their near and dear ones. Probably, we will never understand someone's pain until we feel it in our own lives. Really, if we compare the situation of a few months earlier to that of today, it would seem as if we fell asleep in one world and have woken up in another. We have suddenly realised that religion, caste, beauty and money have no control over destiny. It is difficult to accept that kisses and hugs have unexpectedly become weapons instead of being acts of love. Human beings are now imprisoned in an environment where uncertainty, unknown fear and misbelief pervade the air. As the COVID-19 pandemic races across the globe, researchers from academic and government laboratories to small biotechnology companies and multinational pharmaceutical corporations are working hard to develop new techniques to understand the mechanism of infection, virulence, pharmacology and evaluate potential therapeutics and vaccines to combat against corona virus.

Keeping all pains at bay, researchers all over the world are working hard to carry on their act against corona virus so that everyone can get another chance to breathe oxygen from mother nature but not from a ventilator machine. Here, in this newsletter, the literature reports of a few important antiviral drugs will be showcased as probable treatments for SARS-CoV-2 though none of them can be accepted as indisputable remedies for the disease till date. In controlling the COVID-19, most of the drugs tested by the doctors so far are totally based on the information for similar kind of infections that occurred in the past and treatment is completely oriented towards the 'management' of symptoms.

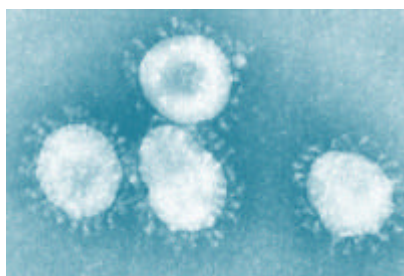
Villainous acts of COVID-19 in human body

Corona viruses (Corona: Crown like shape;) generally belong to a family of enveloped viruses with single-stranded, positive-sense RNA genomes infecting humans and animal species. Study reveals that corona viruses are zoonotic. That means these viruses are mostly present in animals and then transmitted from animals to human beings. In this family of corona virus members, those viruses which are responsible for the common cold are known as severe acute respiratory syndrome corona virus and Middle East respiratory syndrome-related corona virus. However, the one that has recently emerged is the severe acute respiratory syndrome corona virus 2. WHO declared the COVID-19 outbreak as the sixth public health emergency of international concern.

Graphical representation of structure of corona virus



Representative structure of corona viruses



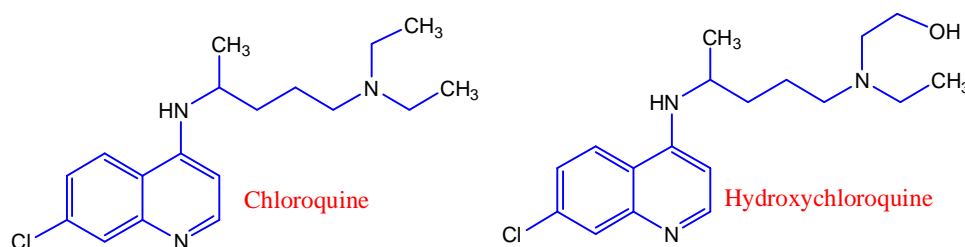
General symptoms of COVID-19 disease at the onset of illness are general myalgia, fever and cough. Often the symptoms are extended to production of sputum, headache and diarrhea. Modern research indicates that binding of cell through viral S protein to the host receptor angiotensin-converting enzyme 2 is obligatory for the infection to occur. After entering the cell, gradually the virus complex is translocated to the endosome. Endosomal acid proteases present in endosome then cleaves the S protein. Viral genome is then released and gets translated into the viral replicase polyproteins PP1a and PP1ab.

Viral proteases are responsible for the breaking down of such polyproteins into functional proteins. Through discontinuous transcription, subgenomic templates for mRNA synthesis and translation of the viral structural proteins take place. Viral replication complex mediates viral genome replication and it includes an exonuclease N, RNA-dependent RNA polymerase, helicase and other accessory proteins. Viral nucleocapsids from the packaged viral genomes and translated viral structural proteins assemble at the endoplasmic reticulum-Golgi intermediate compartment. Subsequently, there is the release of infectious virions from the cell through exocytosis.

SARS-CoV-2 being a new disease does not have any clinically proven therapeutics. It is worthwhile to mention that for the treatment of SARS and MERS, no therapeutic or vaccine designing schedules got completed as these outbreaks did not persist. Consequently, the concepts of drug repositioning and repurposing has received a substantial amount of consideration.

Chloroquine and Hydroxychloroquine as possible remedies

While scientists all over the globe were hell-bent on finding an antidote to the deadly disease caused by this microorganism, certain experts have zeroed down on Chloroquine and Hydroxychloroquine as possible remedies for this. Chloroquine is not a new name in the world of medicines. It is widely used as an anti-malarial drug with immune modulatory effects, as a potential curative drug in the treatment of malaria and amebiasis. Chloroquine was found to inhibit the growth of SARS-CoV-2 in an in vitro study. Its sister compound, Hydroxychloroquine, however, is a more suitable option for the treatment of malaria and autoimmune conditions because though it shares the same mechanism of action as Chloroquine, the intensity of its toxicity is far lower than that of its sister. Hydroxychloroquine was reported to have anti-SARS-CoV activity in vitro in the previous SARS outbreak. It can therefore be surmised that Hydroxychloroquine is a reliable pharmacological agent for the treatment of COVID-19 infection.



Will Remdesivir work?

This is the question which is now plaguing the minds of common people. Remdesivir, one of the initial clinical candidates was developed by Gilead Sciences in a collaborative way with the U.S. Centers for Disease Control and Prevention and the U.S. Army Medical Research Institute of Infectious Diseases. The development of Remdesivir was a part of an antiviral development project of Gilead Sciences in 2015 which was initially effective against Ebola virus. Though Remdesivir was not developed for the treatment, now it is used to treat COVID-19 as among the candidate therapies.

Our helplessness

COVID-19 pandemic as continues to spread across the world, killing thousands of people and bringing the economies to their knees, doctors, scientists and governments are on the lookout for safe and effective treatments to help those who are infected. However, the tragedy with COVID-19 is that there is no reliable medicine that can cure it yet. The above mentioned drugs are not foolproof. Let us hope that at least any one of them comes out to save the human race individually or in combination with other drugs.

Let us salute our researchers, doctors, nurses, health workers and those people who are constantly working for us.

Report on CONTECH 2019-2020

ACT-CONTECH, a concept test in chemistry at national level finds its usefulness in knowing the pulse of chemistry teaching and learning at UG level and thus helps teachers to take appropriate action. It aims to strengthen the teaching profession and to monitor the progress and achievement of UG students in chemistry. This test is a big boost for the students to improve in the subject and to assess their conceptual understanding in chemistry. With this view CONTECH has regularly been conducted annually right from 2010 and twice a year from 2017-2018, to serve the masses in the Nation.

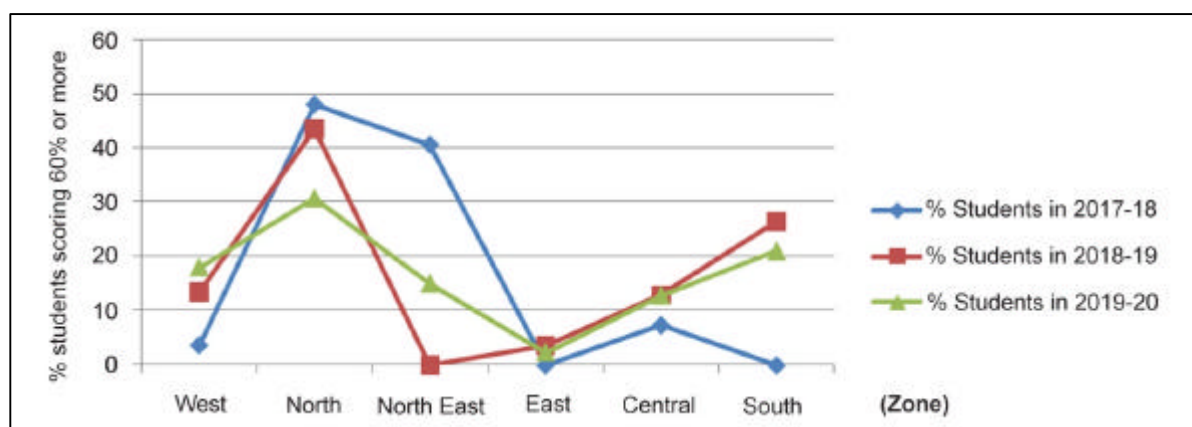
This examination consists of scientifically crafted Eighty Multiple Choice Questions with four options with a correct answer. Each question merits one mark. There is no provision of negative marking for a wrong choice.

Wide publicity was made to CONTECH through the ACT officials and Chemistry Teachers. The test for the academic year was organised on two dates, 9th November 2019 and 31st January 2020.

Year Wise and Zone Wise Percentages of Centres				
Zone	No. of Centre in % (2016)	No. of Centre in % (2017-18)	No. of Centre in % (2018-19)	No. of Centre in % (2019-20)
West	41.09	32.4	41.75	37.0
North	17.8	14.5	16.48	12.0
North East	9.58	18.3	4.39	4.3
East	9.58	9.4	10.98	5.4
Central	12.3	16.4	7.69	8.7
South	9.58	9.3	18.68	30.5

In term of the number of examination centres, West Zone ranked 1st in the country followed by South and North Zone. Central, East and North East Zone follow the lower ladder. However, there is a drop of centres in West Zone in comparison to 2018-19. Similar situation has been reflected in North and East Zone whereas an increase in number of centres has been observed in South and Central Zone. More or less trend of examination centres in term of percentage remains same in North East Zone.

In term of number of examinees' percentage appearing from a zone, West Zone again topped the list in tune with the previous year followed by South, Central, North, East and North East Zone. However, comparative data with respect to 2019-20 shows a drop in examinees percentage in West and East Zones.



Zone wise % students scoring 60% or more in 2017-18, 2018-19 and 2019-20

North zone excels throughout consecutively whereas lots of fluctuation is observed in North East zone in term of students scoring 60% or more in the years specified.

Certificates from ACT

ACT approved 'Certificate of Participation' duly signed by the President, General Secretary, National Coordinator and College Coordinator have been issued to students scoring 30% or more, whereas 'Certificate of Excellence' are given to students scoring 60% or more.

In addition, at local level, Centre Heads (Principals/College Coordinators) have freedom to give away the awards to the meritorious students.

Letter of appreciation is mailed to all the Principals of the Colleges involved in CONTECH.

'Certificate of Appreciation' are issued to all College Coordinators after successful conduct of the Test. These certificates are also issued to all the Local Coordinators who appoints at least 10 active College Coordinators. College/Local Coordinators who register 100 or more than 100 participating students shall receive Annual Subscription Fee of Journal 'Resonance'.

The Special Award will be given to the College Coordinator for having maximum participation of students in the country. Dr. Nishamol Kanat (Mumbai, West Zone), Dr. Dhanesh Singh (Raigarh, Central Zone), Dr. Rashmy Nair (Jaipur, Central Zone), Dr. Milind V. Gaikwad (Pune, West Zone), Dr. R.Srinivasu (Vizianagram, South Zone), Dr. S. A. Shah (Chandrapur, West Zone), Dr. Mamta T. Sangole (Akola, West Zone), Dr. Valsamma Wilson (Mumbai, West Zone) have consistently been performing well in term of maximum participation. They deserve special thanks.

Dr. Uttara Dutta & Dr. Tripti Kumari (Delhi, North Zone), M. Parameswari (Kanchipuram, South Zone), Dr. R. Subha (Tiruchirappalli, South Zone), Dr. S. D. Katre (Gondia, West Zone) and Y. Ramesh Naidu (Vizianagram, South Zone) contributed to maximum participation first time.

Prof. K Krishna Kishore (Vijayanagaram, South Zone) owe special thanks for their outstanding contributions for involving maximum number of students from various colleges in Andhra Pradesh to participate in CONTECH as a Local Coordinator.

The maximum contributing regions are Mumbai in West Zone and Vijayanagaram in South Zone. It is a proud moment for all of us that more and more chemistry teachers and students are taking interest in such a test for the interest of students learning chemistry as is obvious from the increasing trend of participating students year by year but still we need to do a lot in term of getting all the non-participating states and union territories involved. Affirmative response from all the stakeholders for popularization of chemistry in future is welcomed.

Concluding Remarks

It is encouraging for all of us that participation of students in CONTECH is increasing year by year. Some regions have done well in term of participation and result as well, some have done partially well but some have not yet participated in the Test. Special attention is required to involve students from the regions specified in future through ACT officials, Life members and Chemistry teachers in general. Appreciable comments have been received by the coordinators in general. The valuable suggestions are always welcomed to improve the overall conduct of CONTECH in future. Yearly subscription of reputed national journals such as Resonance is proposed to be given by ACT to all those teachers who credited maximum participation of candidates.

Report by : Dr. Subhash Prasad Singh, National Coordinator CONTECH, A.N. College, Patna.

Report on International Conferences

A three day International conference on 'Advanced Functional Materials' was organised by Kamala Nehru Mahavidyalaya, Nagpur, in association with ACT Mumbai, during January 23-25, 2020.

Dr. W. B. Gurnule, Convener welcomed the participants and explained the objectives of the International Conference. Dr. Smeeta Wanjarri presided over the Inaugural session and Dr. Vedprakash Mishra, Chancellor, Krishna Institute of Medical Sciences, Karad was the chief guest who released the abstracts book. Prof. Md. Abhu B.H. Susan, University of Dhaka, Bangladesh delivered keynote address.

Plenary and Invited talks were conducted in thirteen technical sessions, during three day conference which was focused on various key areas in Advanced Functional Materials. About 430 participants from different parts of the country had participated in this conference and seventeen among the total participants were from abroad.



Prof. Rameshwar Adhikari, Tribhuvan University, Nepal; Prof. O.F. Nnaemeka, Federal Polytechnic, Nigeria; Prof. Rajesh Pandit, Tribhuvan University, Nepal; Prof. Gulshan Ara, Jagannath University, Dhaka; Prof. Bhim Kafle, Katmandu University, Nepal and Prof. Aziz Hasan, University of Malaya, Malaysia were among the speakers with their academic presentations.

Prof. D.V. Prabhu, General Secretary ACT from Wilson College, Mumbai delivered a talk on 'Innovations in Science Education through International Science Olympiad'. Prof. M. Swaminathan, ACT EC member from Kalasalingam Academy of Research and Education, Krishnankoil delivered another talk on 'Nano-materials for Energy and Environment'.

Invited talks were also delivered by Prof. P. Nikalji, Wilson College, Mumbai; Prof. N. Shimpi, University of Mumbai; Prof. S. Minakshisundram, Annamalai University, Tamilnadu; Dr. S. Bhosale, Goa University; Prof. R. K. Shukla, University of Lucknow; Prof. N S Gajbhiye, I.I.T. Kanpur; Prof. S.N. Tiwari, Gorakhpur University; Prof. S.A. Patil, Karnataka University, Dharward; Prof. A. Shrivastava, University of Lucknow; Prof. I.B.S. Rai, Dr. H.S.G. University, Sagar; Prof. S.S. Umare, VNIT, Nagpur and Prof. Tokeer Ahmad, Jamia Islamia University, New Delhi.

There were more than 90 oral presentations and 320 poster presentations. Awards for best presentations were given in the concluding function, which was chaired by Dr. D.S. Badwaik, Principal, Kamala Nehru Mahavidyalaya, Nagpur. Dr. Mukesh Chhadha, Jawaharlal Nehru Aluminium Research Centre, Nagpur was the Chief Guest, who gave valedictory address. The conference was received well by the participants.



Three day International Conference on 'Recent Advances in Chemical, Pharmaceutical and Biological Sciences' was organized by Department of Chemistry, Acharya Nagarjuna University, Guntur, during 5-7, March 2020. This conference was sponsored by University Grants Commission, New Delhi. Financial support was also extended by A.P. Academy of Sciences and ACT, Mumbai.

Dr. D. Ramachandran, Associate Professor, A.N. University and Director of the conference welcomed the delegates and participants. Prof. K. Hemachandra Reddy, Chairman, A P S C Higher Education was the Chief Guest of the Inaugural session. Prof. P. Rajasekhar, Vice Chancellor, A.N. University delivered the presidential address. Dr. B. Venkateswara Rao, Chief Scientist, CSIR-ICT Hyderabad presented the key-note address.

Dr. Lakew W. Abachiri from Ambo University, Ethiopia delivered an invited talk on 'Wetland Degradation and its Impacts on Natural Resources; Prof. S. V. Charles from University of Malaysia Sabah, Malaysia on 'Borneon Natural Products' and Dr. G. Venkateswara Rao from Medical College of Wisconsin, U.S.A. on 'Nano-science in Interventional Oncology'.



Dr. Mannam Krishna Murthy, Secretary ACT south zone from Varsity Education Management Ltd., Hyderabad delivered an invited talk on 'Recent Advances in Hydrogen Fuel Technology'. Dr. B. Hari Babu, ACT Life member from A.N. University, Guntur on 'Hispolones - Towards Possible Antitubercular Agents' and Prof. M.V. Basaveswara Rao, ACT Life member from Krishna University, Machilipatnam on 'Multi-functional Lipid Dye for Biomedical Applications'.

Prof. A. Ramesh from I.I.T., Guwahati; Dr. K. Suresh Babu from I.I.C.T., Hyderabad; Dr. C. Suresh Reddy from S.V. University, Tirupathi; Prof. S. Jena from K.I.I.T., Bhubaneswar; Dr. K. V. S. Ranganath from B.H.U., Varanasi; Prof. P. Venkatesu from University of Delhi; Prof. N. Veeraiah from A.N. University, Guntur and Dr. (Mrs). R. Vinodhini from College of Medicine and Health Sciences, Ethiopia were the other speakers who presented on useful topics of Chemistry and other related branches of Science.



Prof. K. Rosaiah, Registrar, A.N. University presided over the concluding session. Prof. Roman R. Ganta from Kansas State University, U.S.A. delivered the valedictory address. There were 170 oral and 120 poster presentations on research work. Prof. A. Prameela Rani, Principal, A.N. University College of Science gave prizes to the best three research paper presenters.

Report on National Chemistry Events

Department of Chemistry, Wilson College in collaboration with ACT and University of Mumbai organized One day National Conference on 'New Dimensions of Chemistry' on 1, February 2020. Keynote Address was delivered by Prof. Sheshanath V. Bhosale from Goa University. Prof. Anna Pratima G. Nikalje, Principal of the college acted as Convener of the conference. Prof. Salina Bootwala and Prof. S.S. Borde coordinated the academics. Prof. D.V. Prabhu, General Secretary, ACT was active in the organization of the conference.



Invited talks were given by Dr. S. Majumdar from TIFR; Dr. Alfred Lawrence from IT College, Lucknow and Dr. Vishwanath Patil from Mumbai University.

About 90 delegates participated in this conference from various parts of the country. The most heartening feature of the conference was the participation of a large number of postgraduate and research students. 18 oral presentations and 15 poster presentation were held. Three prizes, one for poster and two for oral presentations were awarded by ACT. Dr. Ravindra Deshmukh, Chairman of Board of studies in Chemistry also participated in the later sessions.

The efforts of all the eminent speakers who shared their research experiences and scientific knowledge with the delegates have contributed to the excellence of this event.

A two day National Seminar on 'Waste Management: Role of Chemistry' was organised on 22-23 January 2020, by the Department of Chemistry, DAV College, Kanpur (UP). It was sponsored by Higher Education Directorate, U.P. Government and ACT.

The chief guest Prof. R.K.P. Singh, Vice-Chancellor, Dr. Shakuntala Mishra National Rehabilitation University, Lucknow released the souvenir containing abstracts of research papers. The seminar was presided by Dr. Narendra Mohan, Director, National Sugar Institute, Kanpur. Dr. Amit K. Srivastava, the Principal, welcomed the audience. The importance and relevance of the theme of the seminar was explained by the convener, Dr. Rohit Mohan.



The prominent speakers were: Prof. D.P. Mishra, IIT Kanpur; Dr. D.S. Bag, Joint Director DMSRDE; Prof. C.L. Gehlot, HBTU; Dr. S.K. Tiwari and Dr. Poonam Singh (both from NBRI, Lucknow) and Dr. Shakti Vinay Shukla, Director, FFDC, Kannauj.



Prof. Amar Srivastava, ACT EC member gave his talk on 'Chemical waste management through green chemistry'. Faculty members of local colleges and PG students also participated through presentations. The speakers deliberated on role of green chemistry and management of wastes. The seminar was attended by more than 200 delegates, from various parts of the country, and over 100 PG students. Vote of thanks was given by Head of the Department, Dr. Sudhir K. Srivastava in the concluding session.

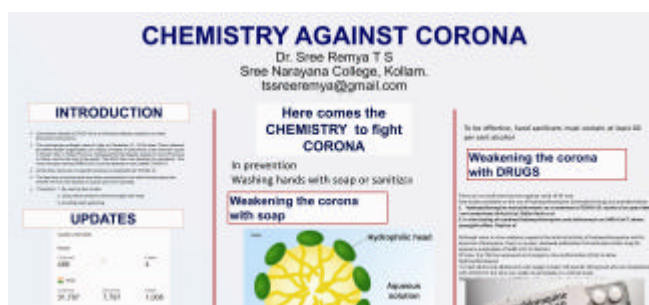
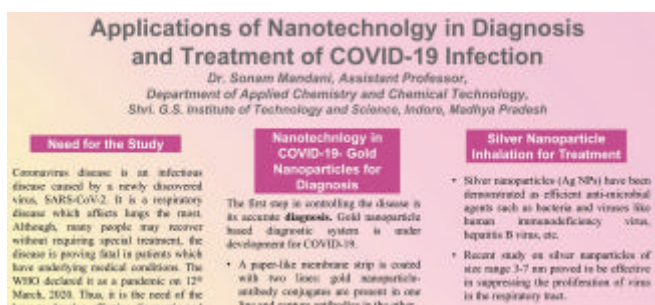
National Conference on 'Synargetic Research Developments in Chemical, Biological and Environmental Sciences' was jointly organized by GITAM University and ACT at GITAM School of Science, Bangalore on 14, March 2020. Dr. R. V. Nath, Life member ACT coordinated the event.

Prof. K. Srinivas, Principal, Gitam School of Sciences chaired the inaugural session. Prof. P.S. Mukharjee, I.L.Sc. Bangalore gave key note address. Dr. G.V.N. Rao, M.S. Pharma, Bangalore and Dr. U.A. Ramgopal, Poornaprajna Institute of Scientific Research gave invited talks. There were oral, poster and skype presentations of research papers. Dr. R. Rao Bhonsle organizing secretary proposed vote of thanks in the concluding session.

Madhav Science PG College, Ujjain and I.P.S. Academy of Indore jointly organized a 'National Online COVID-19 Quiz' on 27, April 2020. This online program was catalysed by ACT, Mumbai and coordinated by Prof. Brijesh Pare, President ACT. Support was extended by Prof. Arpan Bharadwaj, Principal, Madhav Science P.G. College.

About 400 students from Gujarat, Karnataka, Tamilnadu, Assam, M.P., U.P., Bihar, Sikkim, Nagaland, Rajasthan, Maharashtra and Delhi participated in the online quiz.

An online poster competition was also conducted on Chemistry in managing Corona Virus and Chemistry against COVID-19. Best presentations were awarded with prizes.



Mrs. Ruchi Shrivastava, HOD Chemistry M.S. P.G. College, Ujjain and Prof. Premlatha Gupta, Principal, IPS Academy, Indore served academically for the success of this chemistry event, related to current global problem of corona virus.

Report on National Science Day Celebrations

The 'National Science Day' was celebrated jointly by DBTS College Scheme and ACT, at A.N. College, Patna. Dr. Sushil Kumar Singh conducted the proceedings. The theme of celebration of Science Day was 'Women in Science'. Dr. A.K. Ghosh, Chairman, Bihar State Pollution Control Board delivered an invited talk.

Science Quiz was conducted by Prof. Tripti Gangwar, HOD, Department of chemistry. Quiz contest was followed by the Invited Talk, by Dr. Sushil K. Singh on Increasing pollution is a threat to environment and eco-system. Science Extempore Speech was conducted by Ms. Shabana Karim in which 25 students participated. UG students took lead in organizing the function.



Dr. Subhash Prasad Singh, Secretary, ACT East Zone and coordinator, DBT Star College Scheme from catalyzed the students of various science departments to participate in the event.

The Department of Chemistry, SRM Institute of Science and Technology, Ramapuram campus, Chennai and ACT jointly organized 'National Science Day-2020' for the school students on 28, February 2020. Prof. Helen P. Kavitha, Head, Dept. of Chemistry welcomed the gathering.



The chief guest Prof. Mangla Sunder Krishnan, HOD Chemistry, Indian Institute of Technology-Madras, inaugurated the science day and delivered key note address on the importance of Science.

Scientific talk was given by Dr. Manu Jaiswal, Department of Physics, IIT-Madras. Some exciting scientific experiments were lively demonstrated which helps to stimulate the interest of science among the student community.

Around 350 students from 15 schools took active participation in various competitions like Essay writing, Quiz, Drawing and Waste to Wealth. First year B.Tech. students, SRMIST have participated in Oral and Poster presentation.

Prizes were given to the winners and Certificates were distributed to all participants during the Valedictory function.



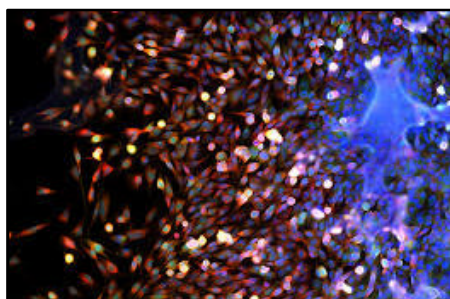
Electricity from Air

Scientists from Massachusetts Institute of Technology, Cambridge developed an instrument called 'airgen', which can generate electricity from the water vapour present in the air. Proteins derived from Geo-bacter bacteria were used in the preparation of nanowires. These wires are used as electrodes with airgen, which can generate electricity due to a possible chemical reaction. Preparation of biofilms of thickness 50 microns from Geobacter is in progress. These films specifically interact with acetate and help in the flow of electrons.



Tiny Nanoparticles in Brain Cancer Treatment

For patients with malignant brain tumors, the prognosis remains dismal. With the most aggressive treatments available, patients are usually only expected to live about 14 months after a diagnosis.

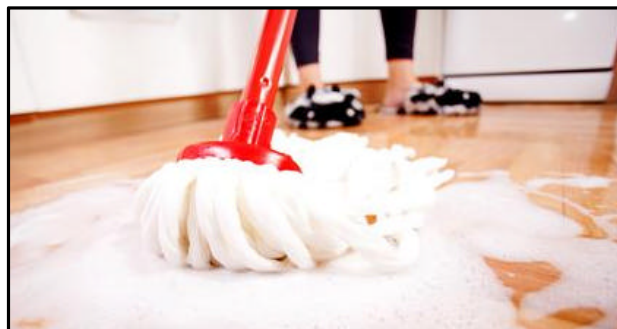


This is because, chemotherapy, the most common form of treatment for cancer, is uniquely challenging for brain tumor patients. The delicate organ in our skulls is protected by a network of vessels and tissue called the blood-brain barrier that keeps most foreign substances out. Furthermore, chemotherapy drugs can cause significant damage to the rest of the body if they are not able to target the tumor in a pharmacologically significant dose.

These challenges have plagued scientists for years, but a team of researchers for Yale School of Medicine and Beijing Normal University just published a breakthrough study detailing a new method that offers a promise at treatment.

House Cleaning Chemicals may cause Asthma

Variety of chemical substances are used nowadays for cleaning floor, kitchen, latrine and bathrooms. These chemicals not only kill bacteria but also provide aroma. Scientist from Siman Frajar University recently observed the side effects of these chemicals, as they can cause asthma and snoring in children. The use of some natural organic substances may be an alternative to the commercial cleaning chemicals.



Yatch to run with Hydrogen Fuel

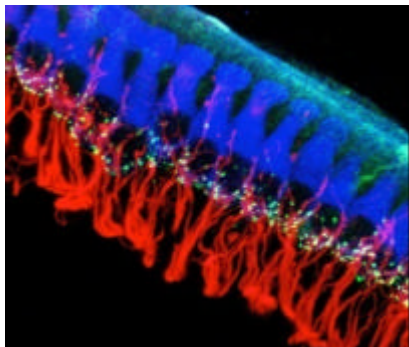


Co-founder of Microsoft corporation, Bill Gates purchased a sailing boat, well equipped for cruising, for an amount of 4600 crores this February.

This cruise will run using liquid hydrogen fuel maintained at -253°C ; two fuel tanks of each 28 tons capacity. It can run for about six thousand kilometers with single filling of the hydrogen fuel.

This pollution free 370 feet long Yatch is named as 'aqua' and is expected to take its first run in the mediterranean sea from the French Coast of Monaco, during 2024.

Chemical Ear Defenders



Discovery of receptor connected to hearing loss has led to a chemical compound that can protect the neuro mechanical machinery in mice's ears. Hearing loss caused by loud or prolonged noise could be prevented by a compound that could act like a set of chemical ear defenders – without blocking out sounds altogether.

The cochlea is the ear's hearing organ. It's an intricate neuro-mechanical device. The two cell types responsible for getting the sensation of sound to the brain.

Unknown Light rays on to the Earth

Scientists from British Columbia, Canada observed unknown electromagnetic radiation on earth, early this year. The recognition was possible using hydrogen intensity mapping experiment. These rays were found to exist only for one millisecond at an average of once in every 16 days.

These unknown light rays may be generated from a place, beyond the Galaxy.



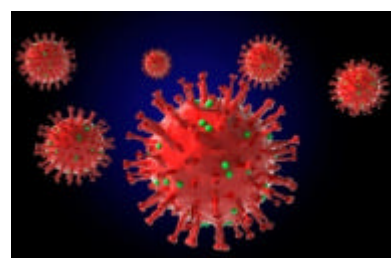
Plastic Recycling heading for the Mainstream



An alternative technology for recycling plastics is starting to gain traction: Chemical recycling. The goal here is to break long plastic polymer chains down into shorter hydrocarbons and then rebuild them into brand new polymers, suitable for any purpose.

Corona Virus reduces China's CO₂ Emissions

COVID-19 may have shaved off more than 100 tons of CO₂ in early February 2020, according to a report by climate watch website Carbon Brief. Measures taken to control the epidemic resulted in reductions of 15 to 40 per cent in output across key industrial sectors. China had released more than 400 tons of CO₂ in the same period in 2019.

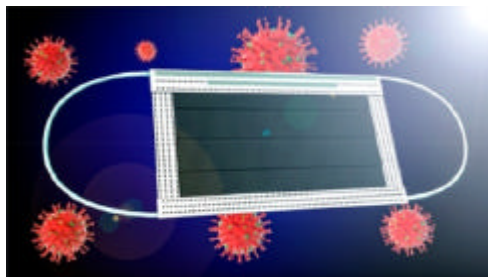


The report says that use of coal at power stations have dipped to a four-year low, oil refinery operating rates in Shandong province have reached the lowest since 2015 and domestic flights are down to 70 per cent compared to last month. As a result, nitrogen oxide pollution level in the air is 36 per cent lower compared to the same period last year.

NCCT-2020

Executive Council of ACT approved the offer received from Dr. P. Shyamala, School of Chemistry, Andhra University, Visakhapatnam to organize National Convention of Chemistry Teachers 2020. The tentative dates of convention are 4-6, November 2020.

Reusable and Recyclable Graphene Masks



The 2019 corona virus outbreak is affecting over 210 countries and territories and it is spreading mainly by respiratory droplets. The use of disposable surgical masks is common for patients, doctors and even the general public in highly risky areas.

This graphene-coated mask can be recycled directly for use in solar-driven desalination with outstanding salt-rejection performance for long-term use. These roll-to-roll production-line-compatible masks can provide us with better protection against this severe virus. The environment can also benefit from the direct recycling of these masks, which can be used for desalination seawater.

Lockdown helped to minimize Pollution

Life was almost static world wise due to the impact of corona virus. As people stay at home in the lockdown period, unexpected things are happening in the environment. Sky is retaining its natural colour stars can be seen clear during night time. Animals are moving with more freedom. Clouds are non-visible in Delhi free from dust and smoke. Nitrogen dioxide is reduced by 30% in north-east part of America.



Air pollution is decreased to one-half in Rome, during March and April of this year. Similar reduction of air pollution was also noticed in Paris, Bangalore, Sidney, Loss Angels, etc.

The excelsior and miracle of decrease in air pollution will help in decreasing chronic problems with lungs. Surprisingly the bad effects of corona will also expected to be decreased.



Dr. Pradeep K Srivastava

Dy. Director (Sr. Principal Scientist, Retd.)
CSIR-CDRI, Lucknow.



In recent years, there has been a great effort devoted to the investigation of the roles of **CARBOHYDRATES** in various essential biological processes and the development of carbohydrates to therapeutic drugs.



"Carbohydrate content, Antioxidants, free radicals, flavanoids, minerals....all the beneficial properties of vegetables, How do I know all these? Very simple! Actually I used to be a scientist before. I recently got superannuated."

ASSOCIATION OF CHEMISTRY TEACHERS

(Promoting Excellence in Chemistry Education)

C/o. Homi Bhabha Centre for Science Education (HBCSE, TIFR)
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Group photo of the Executive Council of ACT
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