



University of Sahiwal

Office of Research, Innovation &
Commercialization (ORIC)



2020 Research Symposium

In the field of

Chemistry & Physics

Jointly organized by ORIC, University of Sahiwal and Punjab Higher
Education Commission (PHEC) on Saturday, February 29, 2020

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Event Schedule (February 29, 2020)

Timings	Items		
08:00 – 09:00	Registration (Main Hall, Academic Block-1)		
09:00 - 09:20	Recitation of Holy Quran Welcome Note by Director ORIC & Worthy Vice Chancellor Prof. Dr. Muhammad Nasir Afzal		
09:20 - 09:45	Keynote Speaker: Dr. Syed Shahzad ul Hussan , Associate Professor, SBA School of Science and Engineering, LUMS, Lahore		
09:45 – 01:00	Research Presentations (Chemistry) Chair: <i>Dr. Muhammad Naeem Khan</i> Experts: <i>Dr. Muhammad Amin Abid, Dr. Abdul Hameed, Dr. Muhammad Ahmad, Dr. Abdur Rauf, Dr. Ikram Ahmad, Dr. Shafia Iftekhara, Dr. Ahmad Kaleem Qureshi, Dr. Komal Rizwan, Dr. Tariq Javed, Dr. Jamaluddin, Dr. Abdul Ghafoor, Dr. Muhammad Idrees Jilani</i>	Research Presentations (Physics) Chair: <i>Dr. Hafiz Tariq Masood</i> Experts: <i>Dr. Muhammad Asif Nawaz, Dr. Uzma Ikhlaga, Dr. Muhammad Rafique, Dr. Sarmad Masood Shaheen</i>	Projects Display / Poster
01:00 - 01:30	Note of thanks, certificates, best paper award (Main Hall, Academic Block-1)		
01:30 - 02:30	Lunch		

Schedule of Presentations

CHEMISTRY

Sr #	Name	Designation	Affiliation	Title	Time Slot	Venue
Introductory Note By Chair of Session & Department Head					09:45-10:00	Main Hall
1	Dr. Muhammad Saeed	Associate Professor	Department of Chemistry & Chemical Engineering, Lahore University of Management Sciences, Lahore	Invited Speaker Designing and Syntheses of Interesting Heterocyclic Compounds as Inhibitors of Dengue Virus Protease: Development of Anti-dengue Therapeutics	10:00-10:25	Main Hall
2	Dr. Zeshan Ali	Assistant Professor	Assistant Professor, Minhaj University Lahore Pakistan. Postdoc Researcher, Shaanxi Normal University China	Preliminary study to evaluate the phytochemicals and physiochemical properties in red and black date's vinegar	10:25-10:40	Main Hall
3	Dr. Khurram Shehzad		Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei, China. University of Science and Technology of China, Hefei, 230026, China	Mesoporous Zirconia Nanostructures (MZN) for Excellent Adsorption of As(III) and As(V) from Aqueous Solutions	10:40-10:55	Main Hall
4	Miss. Maryam Batool	Research Scholar,	Department of Chemistry, University of Sahiwal, Sahiwal.	Exploring The Reusability of Synthetically Contaminated Wastewater Containing Crystal Violet Dye Using Cedrus deodara as an Adsorbent	10:55-11:10	Main Hall

5	Prof. Dr. Khalid Mohammed Khan	Professor	H. E. J. Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi	Syntheses Of Novel A-Amylase And A-Glucosidase Inhibitors	11:10-11:25	Main Hall
6	Dr. Rahman Shah Zaib Saleem	Associate Professor (tenured)	Department of Chemistry & Chemical Engineering, SBASSE, LUMS.	New modulator of tubulin dynamics capable of overcoming multidrug resistance in cancer cells	11:25-11:40	Main Hall
7	Mr. Ilyas Muneer	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal.	A brief study of adsorption of Congo red dye over sawdust of Cedrus Deodara	11:40-11:55	Main Hall
8	Dr. Syed Salman Shafqat	Assistant Professor,	Department of Chemistry, University of Education, Lahore.	Novel Heterocyclic Grafted Silica Nanoparticles for Adsorptive Removal of Azo Dye from Aqueous Media	11:55-12:10	Main Hall
9	Mr. Nadeem Faisal	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal	Formation and physio-chemical characterization of chitosan films incorporated with natural anti-oxidants for food packaging	12:10-12:25	Main Hall
10	Mr. Mehmood Ali	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal	Effect of Extraction Techniques on Yield, Chemical Composition and Biological activities of Lemongrass Essential oil	12:25-12:40	Main Hall
11	Mr. Rizwan Qayyum	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal	Chemical behaviour and organic electronic properties of fluorene containing chromophore	12:40-12:55	Main Hall

12	Mr. Rizwan Qayyum	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal	Perylene synthesis and optoelectronics properties of novel perylene based solution-processable derivatives	12:55-13:10	Main Hall
13	Miss. Aqsa Liaqat	Research Scholar,	Department of Chemistry, University of Sahiwal, Sahiwal.	Design, Synthesis and Biological Screening of Oxino-bis-Pyrazoles	13:10-13:25	Main Hall
14	Mr. Hafiz Nawaz Hussain	Research Scholar,	Department of Chemistry, University of Sahiwal, Sahiwal.	Synthesis and Characterization of Aromatically Decorated Biologically Active Scaffolds	13:25-13:40	Main Hall
15	Miss. Shumaisa Anwar	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal.	Synthesis, Characterization and Biological Studies of Pyrazole Derivatives	13:40-13:55	Main Hall
16	Miss. Bushra Latif	Research Scholar	Department of Chemistry, University of Sahiwal, Sahiwal.	Synthesis, spectroscopic and electrochemical studies of perylene based azo hybrid dye	13:55-14:10	Main Hall

Schedule of Presentations

PHYSICS

Sr #	Name	Designation	Affiliation	Title	Time Slot	Venue
Introductory Note By Chair of Session & Department Head					09:45-10:00	Room 01
1	Mr. Abbas Ali	Research Scholar	Riphah institute for computing and applied sciences, Riphah International University, Pakistan	Tungsten oxide (WO ₃) film as a back contact Buffer layer in CdTe thin film solar cell	10:00-10:25	Room 01
2	Mr. Naveed Rasheed	Research Scholar	Department of Physics, The Islamia University of Bahawalpur, Bahawalpur, Pakistan	Synthesis and characterizations of cubic silicon carbide by simple solid state method for solar cell applications	10:25-10:40	Room 01
3	Mr. Muhammad Bilal Azam	Teaching Assistant	Department of Physics, Lahore University of Management Sciences, Lahore, 54792, Pakistan.	Everpresent Δ in the Closed Universe	10:40-10:55	Room 01
4	Mr. Muhammad Umer Farooq	Teaching Assistant	Department of Physics, Lahore University of Management Sciences, Lahore, 54792, Pakistan.	Designing of zero-index metamaterials using 3D photonic crystals	10:55-11:10	Room 01
5	Mr. Rehman Riaz	Visiting Faculty Member	Department of Physics, University of Sahiwal, Sahiwal.	Gauge Theory and Gauge Transformation	11:10-11:25	Room 01
6	Bismillah Mukhtar	Research Scholar	Department of Physics, University of Sahiwal, Sahiwal.	Automatic Solar Tracker Using Arduino UNO	11:25-11:40	Room 01
7	Alina Aziz	Research Scholar	Department of Physics, University of Sahiwal, Sahiwal.	3D cube Light Emitting Diodes	11:40-11:55	Room 01
8	Tayyeba Awan	Research Scholar	Department of Physics, University of Sahiwal, Sahiwal.	Voltage Control System	11:55-12:10	Room 01
9	Muzzamal Jabbar	Research Scholar	Department of Physics, University of Sahiwal, Sahiwal.	Line following and obstacle avoiding robot	12:10-12:25	Room 01



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10	Hamza Khalid	Research Scholar	Department of Physics, University of Sahiwal, Sahiwal.	Slyer Excitor, Power Factor Measurement and Control System	12:25-12:40	Room 01
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ABSTRACTS OF THE PAPERS ACCEPTED TO THE 2020 RESEARCH SYMPOSIUM

FEBRUARY 01, 2020

WORKING PAPERS

1. DESIGNING AND SYNTHESSES OF INTERESTING HETEROCYCLIC COMPOUNDS AS INHIBITORS OF DENGUE VIRUS PROTEASE: DEVELOPMENT OF ANTI-DENGUE THERAPEUTICS

Muhammad Saeed

Department of Chemistry and Chemical Engineering, SBA School of Science and Engineering, Lahore University of Management Sciences (LUMS) Lahore, Pakistan

Objectives: To examine the antioxidant activity, total phenolic content (TPC), total flavonoids, carotenoids, pH, and total titratable acidity of red and black date's vinegar.

Methodology:

Research design: Rationales drug designing approach

Measures: From the solved 3D structure of the DENV NS2BNS3 protease, the substrate binding site (active site) appears as a shallow, highly charged and solvent exposed surface, and thus offering very unfavourable binding features for small organic molecules.

Results: we have synthesized several libraries of heterocyclic compounds and developed a high-throughput enzymatic assay to identify hits for lead optimization. Additionally, a commercial library of drug-like compounds, and several naturally occurring compounds have been screened by the assay to identify interesting hits. This presentation will cover various challenges of using DENV NS2B/NS3 protease as a drug target in the context of the progress of developing anti-dengue DAADs. Finally, the atomic level details of important protease-inhibitor binding interactions, will be presented.

Implications: These finding are highly promising in the context of development of anti-viral therapeutics against DENV.

2. PRELIMINARY STUDY TO EVALUATE THE PHYTOCHEMICALS AND PHYSIOCHEMICAL PROPERTIES IN RED AND BLACK DATE'S VINEGAR

Zeshan Ali

Department of Food and Nutrition sciences Shaanxi Normal University, Xian, China.

Objectives: To examine the antioxidant activity, total phenolic content (TPC), total flavonoids, carotenoids, pH, and total titratable acidity of red and black date's vinegar.

Methodology:

Research design: Extraction method

Sample: red dates' vinegar and black dates' vinegar,

Results: The results showed that red dates' vinegar have significantly ($p < 0.05$) higher total phenols (3.38 ± 0.13 mg GAE/ml) and antioxidant activity as compared to black dates' vinegar, which had a higher amount of carotenoids (3.43 ± 0.11 mg/100 ml). Similarly, red dates' vinegar has more flavonoids as compared to commercially available Zhenjiang vinegar. In terms of physiochemical properties, both red and black date's vinegar was not significantly different ($p > 0.05$). Use of 50% and 80% methanol with 25 min of ultrasonication for extraction seemed more effective.

Conclusion: The total phenols, flavonoids, antioxidant activity, carotenoids, and physiochemical analysis of the red and black date's vinegar indicated that vinegar from dates (red or black dates) is a competitive product in the marketplace.

3. MESOPOROUS ZIRCONIA NANOSTRUCTURES (MZN) FOR EXCELLENT ADSORPTION OF AS(III) AND AS(V) FROM AQUEOUS SOLUTIONS

Dr. Khurram Shehzad

Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei, China.
University of Science and Technology of China, Hefei, 230026, China

Objectives: Arsenic contamination in water has become a serious environmental and health problem due to its high carcinogenicity and toxicity. Still it is a challenging task to develop novel adsorbents with high adsorption capacity and excellent selectivity for As(III) as well as As(V) along with good regeneration ability and field applicability.

Methodology:

Measures: Mesoporous zirconia nanostructures (MZN) were synthesized by hydrothermal method to efficiently remove highly mobile and toxic arsenite (As(III)) and arsenate (As(V)) from aqueous solutions using batch adsorption experiments.

Results: The as-synthesized MZN were characterized by Brunauer

Emmett Teller (BET), X-Ray diffraction (XRD), scanning electron microscopy (SEM), high resolution transmission electron microscope (HRTEM), and Energy-dispersive X-ray spectroscopy (EDX) techniques. The batch adsorption experimental results showed that the As(III) and As(V) removal capacities of the MZN were 105.03 and 110.29 mg/g, respectively, under neutral pH conditions at room temperature, which were better than many recently reported adsorbents. The adsorption behavior of As(III) and As(V) on the MZN could be well described by pseudo-second-order and Langmuir isotherms models. Moreover, As(III) and As(V) adsorption on the MZN was spontaneous, endothermic and favorable with increasing temperature. Some of the common co-existing ions had slightly affected the arsenic removal proficiency of MZN. Fourier transform infrared (FTIR) spectroscopy and X-ray photoelectron spectroscopy (XPS) were used to investigate the adsorption mechanism of As(III) and As(V) on the as synthesized MZN. The as-synthesized MZN demonstrated quite fast and good treatment of simulated real arsenic (As(III,V)) contaminated water.

Conclusions: This study suggested that the as-synthesized MZN are potential candidate for practical applications of As(III) and As(V) removal from the aqueous solutions.

4. EXPLORING THE REUSABILITY OF SYNTHETICALLY CONTAMINATED WASTEWATER CONTAINING CRYSTAL VIOLET DYE USING CEDRUS DEODARA AS AN ADSORBENT

Maryam Batool, Tariq Javed

University Of Sahiwal, Sahiwal, Pakistan

Objectives: To investigate the feasibility of cedrus deodara for the removal of crystal violet dye from aqueous solution.

Methodology:

Research design: Langmuir, Freundlich and Dubinin-Raduskevish isotherm models

Measures: Experiments are performed to optimize the parameters such as particle size of adsorbent (105, 210, 500 mesh sizes), pH (1-12), adsorbent dosage (0.1-1.0 g), initial dye concentration (5-100 ppm), contact time (5-120 min) and temperature (0-60 °C). Optimum conditions i.e. 210 mesh size, pH 7, 0.1 g of adsorbent, 40 ppm of initial dye concentration and 30 min contact time at 60°C results in maximum i.e. 93 % of crystal violet dye removal.

Results: The kinetic models (i.e. pseudo first order, pseudo second order and intra-particle diffusion) and thermodynamic parameters (i.e. change in Gibb's free energy, enthalpy and entropy) are studied. Applicability of this developed procedure with tap water is 90% indicating that cedrus deodara is an effective adsorbent for crystal violet dye removal from aqueous solution.

5. SYNTHESSES OF NOVEL α -AMYLASE AND α -GLUCOSIDASE INHIBITORS

Khalid Mohammed Khan

H. E. J. Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi-75270, Pakistan

Methodology:

Research design: Survey report

Sample: Diabetes patients

Measures: The most recent WHO (2018) survey report proposes that over 4.22 billion population around the globe have been affected from diabetes and about 4.18 billion population will be affected by diabetes mellitus in near future. Non-insulin dependent diabetes mellitus (NIDDM-type 2 DM) is threatening for every age group including children.

Results: The breakdown of starch or glycogen into short chain monomer maltose is catalysed by the hydrolysing enzyme α -amylase (α -1,4-glucan-4-glucanohydrolases, EC. 3.2.1.1) which is secreted from pancreas, the maltose is further hydrolyzed into glucose molecules by α -glucosidase enzyme (EC. 3.2.1.20) that is present in the small intestine. The hydrolysis of starch to glucose results in an increased level of glucose in blood, also known as post-prandial hyperglycemia (PPHG). This PPHG is a primary indication for type II DM. The high level of blood glucose in type II DM results in damage of vital organs, and is also a major risk for

macrovascular complications such as, neuropathy, retinopathy, and nephropathy. One of the effective therapeutic strategies for the treatment of DM is to inhibit the activity of pancreatic α -amylase and intestinal α -glucosidase. For the cure of type II diabetes mellitus, the commercially available drugs are acarbose, miglitol, and voglibose which act as inhibitors of both α -amylase and α -glucosidase enzymes, nevertheless, these hypoglycemic agents have certain limitations due to their adverse effects like abdominal discomfort, flatulence, diarrhea, and meteorism.

Conclusion: Thus, it is necessary to design and synthesize new, and safe therapeutic agents with more efficacy for the control of optimal glycemic index to treat type II diabetes mellitus.

6. NEW MODULATOR OF TUBULIN DYNAMICS CAPABLE OF OVERCOMING MULTIDRUG RESISTANCE IN CANCER CELLS

Safia Manzoor^a, Aishah Bilal^b, Sardraz Khan^a, Rahim Ullah^b, Sunniya Iftikhar^a, Ali Jawaid^b, Amir Faisal^b, Rahman Shah Zaib Saleem^{a*}

^a Department of Chemistry and Chemical Engineering, SBA School of Sciences and Engineering, Lahore University of Management Sciences, Lahore, 54792, ^b Department of Biology, Syed Babar Ali School of Science and Engineering, Lahore University of Management Sciences, Lahore, 54792, Pakistan.

Objectives: To investigate the in developing novel compounds that can display potent antiproliferative activities in cells of different origins and overcomes resistance to microtubule-targeting agents.

Methodology:

Sample: SSE15206 as a novel compound

Measures: In this regard, we report SSE15206 as a novel compound that can causes aberrant mitosis resulting in G2/M arrest due to incomplete spindle formation, a phenotype often associated with drugs that interfere with microtubule dynamics.

Results: SSE15206 inhibits microtubule polymerization both in biochemical and cellular assays by binding to colchicine site in tubulin as shown by docking and competition studies. Prolonged treatment of cells with the compound results in apoptotic cell death [increased Poly (ADP-ribose) polymerase cleavage and Annexin V/PI staining] accompanied by p53 induction. More importantly, we have demonstrated that SSE15206 is able to overcome resistance to chemotherapeutic drugs in different cancer cell lines including multidrug-resistant KB-V1 and A2780-Pac-Res cell lines overexpressing MDR-1, making it a promising hit for further studies to target multidrug resistance.

7. A BRIEF STUDY OF ADSORPTION OF CONGO RED DYE OVER SAWDUST OF CEDRUS DEODARA

Ilyas Muneer¹, Tariq Javed

University of Sahiwal, Sahiwal, Punjab Pakistan

Objectives: To investigate the sorption studies of Congo red dye from an aqueous solution.

Methodology:

Research design: Beer Lambert law.

Sample: SSE15206 as a novel compound

Measures: The sorption studies of Congo red dye from an aqueous solution have been carried out by the sawdust of Cedrus Deodara as an adsorbent by evaluating different parameters such as adsorbent dosage, contact time, initial dye concentration and temperature ranges at constant shaking time of five minutes and centrifugation at 3000 rpm for one minute.

Results: The adsorption isotherm data was studied by applying the Langmuir, Freundlich and D-R isotherms. The maximum adsorption was 82% at 100 ppm initial concentration about 20-minute contact time, 0.25g adsorbent dosage and 60°C temperature. The values for ΔG , ΔS and ΔH were indicating the endothermic nature of the reaction. This method can be efficiently used on the solutions of Congo red dye in tap water.

Conclusion: The results were concluding that Cedrus Deodara can be used as waste material adsorbent or low-cost adsorbent.

8. NOVEL HETEROCYCLIC GRAFTED SILICA NANOPARTICLES FOR ADSORPTIVE REMOVAL OF AZO DYE FROM AQUEOUS MEDIA

Syed salman shafqat^{*1}, Muhammad Ahsan¹, Muhammad Aslam¹, Maria Nosheen²

¹Department of Chemistry, University of Education, ²Department of Chemistry, University of the Punjab

Objectives: To investigate the in developing novel compounds that can display potent antiproliferative activities in cells of different origins and overcomes resistance to microtubule-targeting agents.

Methodology:

Sample: Aminofunctionalized silica nanoparticles by using gelator precursor tetraethoxyorthosilicate (TEOS) and surface modifier, 3-Aminopropyltriethoxysilane.

Measures: Evidence of presence of heterocyclic derivatives on Silica surface was supported by Fourier Transform Infrared (FT-IR) spectroscopy and Thermogravimetric analysis (TGA) and X-Ray Diffraction (XRD). Morphology and size of the particles was studied by using Scanning Electron Microscope (SEM) with the size range (600-650nm for Si-APTS and 750-850 nm for Si-APTS-Het).

Results: The synthesized organically grafted Silica nanoparticles have hydrophobic as well as hydrophilic moieties. The mesoporous structure thus formed had high adsorption capacity due to high specific surface area (80m²/g) measured by BET. The modified silica nanoparticles formed were then used to investigate the adsorptive removal of an azo dye from waste water. The effect of contact time, initial pH, temperature and adsorbent dose were studied. The Langmuir adsorption isotherm gave the best fit to the experimental data as the coefficient of determination (R²) thus obtained was 0.9987 signifying the presence of adsorption monolayer on the surface of the adsorbent.

9. TUNGSTEN OXIDE (WO₃) FILM AS A BACK CONTACT BUFFER LAYER IN CDTE THIN FILM SOLAR CELL

Hafiz Tariq Masood^{a,b,c}, Abbas Ali^d

^aHefei National Laboratory for Physical Sciences at the Micro scale, University of Science and Technology of China, Hefei, Anhui 230026, People's Republic of China,

^bCentre for Optical and Electromagnetic Research, State Key Laboratory of Modern Optical Instrumentation, Zhejiang University, Hangzhou 310058, China, ^cRiphah institute for computing and applied sciences, Riphah International University, Pakistan, ^dRiphah institute for computing and applied sciences, Riphah International University, Pakistan.

Objectives: Tungsten oxide (WO₃) films served as a buffer layer in the back contact of CdTe thin film solar cells to replace the supplement of conventional copper.

Methodology:

Measures: Quantitative band alignment measurement carried out by using X-ray photoelectron spectroscopy (XPS), relatively low energy barrier at the WO₃/CdTe interface was formed.

Results: Valance band offset (ΔE_{VBO}) and conduction band offset (ΔE_{CBO}) between WO₃/CdTe were found to be 0.69 and 1.86 eV respectively. CdTe solar cell stability was significantly enhanced when a WO₃ buffer layer and less Cu were employed to fabricate low-energy barrier back contact. CdTe thin film solar cells fabricated with WO₃ as a buffer layer between CdTe/Cu (3 nm) and metal Au electrode demonstrated a conversion efficiency of 13.0%. Stress tests show that WO₃ buffer layer in a CdTe thin film solar cell significantly enhanced stability.

10. SYNTHESIS AND CHARACTERIZATIONS OF CUBIC SILICON CARBIDE BY SIMPLE SOLID STATE METHOD FOR SOLAR CELL APPLICATIONS

M. Naveed Rasheeda, M. Asghar Hashmib

^a Department of Physics, The Islamia University of Bahawalpur, ^b Department of Physics, Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan

Methodology:

Research design: Scherrer Method, Scherer Plot Method, Williamson–Hall method and Size Strain Method.

Sample: Cubic silicon carbide nanoparticles were successfully synthesized by a simple solid-state method at 1480°C using fullerene.

Measures: To study the structural, optical and electrical properties of grown samples, XRD, Raman, FTIR, UV- vis and IV characterization techniques were employed.

Results: The diffraction peaks at 2 θ value 35.90, 41.59, 60.28, 72.08 with planes (111), (200), (221), (311) respectively, confirmed the formation of cubic silicon carbide. Raman peak at 796 cm⁻¹ indicates the grown silicon carbide is cubic. The Si–C vibrational mode at around 788 cm⁻¹ in FTIR spectrum supported growth of silicon carbide. UV- Vis spectroscopy is used

to study the optical parameters of grown sample such as optical band gap energy ($E_g = 2.34$ eV), extension coefficient, optical conductivity, optical density, dielectric constant, refractive index and skin depth. Grown sample with graphene gives outstanding results for IV. IV results enhanced to micro amperes.

11. FORMATION AND PHYSIO-CHEMICAL CHARACTERIZATION OF CHITOSAN FILMS INCORPORATED WITH NATURAL ANTI-OXIDANTS FOR FOOD PACKAGING

Nadeem Faisala, Muhammad Idrees Jilani^{a*} and Muhammad Asif Hanif^b

^aDepartment of Chemistry, University of Sahiwal, Sahiwal-57000, Pakistan, ^bDepartment of Chemistry, University of Agriculture, Faisalabad-38040, Pakistan.

Objectives: The purpose of this study is the production of AFP to overcome or remove environmental constraints and harmful effects on humans, because of the synthetic materials, through the use of natural sources.

Methodology:

Sample: Essential oils (EOs) as well as hydro-alcoholic extracts (HAE) of black tea, ginger, thyme and green tea were incorporated in the matrix of chitosan separately and observed the properties of produced polymers.

Measures: The incorporation of natural antioxidants into chitosan polymers was evaluated and the physical and chemical properties of the resulting polymers were observed.

Results: It was found that, scavenging properties of chitosan films were comparatively higher for HAEs incorporation and had lesser water solubility as well. It was found that the scavenging properties of chitosan films were comparatively higher for the incorporation of HAE and also had lower water solubility. But when we speak in general terms of the chemical and mechanical properties of the resulting polymers, the green tea and black tea HAE and thyme EO can be considered to have the most desired properties.

12. EFFECT OF EXTRACTION TECHNIQUES ON YIELD, CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES OF LEMONGRASS ESSENTIAL OIL.

Mehmood Alia, Muhammad Idrees Jilani^{a*}, Tahir Naveed^b, Raziya Nadeem^b and Muhammad Asif Hanif^b

^a Department of Chemistry, University of Sahiwal, Sahiwal-57000, Pakistan, ^b Department of Chemistry, University of Agriculture, Faisalabad-38040, Pakistan

Objectives: To investigate the in developing novel compounds that can display potent antiproliferative activities in cells of different origins and overcomes resistance to microtubule-targeting agents.

Methodology:

Research design: statistically analyzed

Measures: various extracts of lemongrass were also prepared in n-hexane, methanol and ethanol. EOs extracted from the SCFE method was observed to be have maximum yield as

well as better quality EOs as compare to that of other two methods because of the use of low temperature in SCFE method. Netrol and citral were observed to be as major chemical compounds in EOs. Antioxidant activities of EOs (HD and SD) and various extracts was evaluated by the measurements of reducing power, total phenolics contents (TPC), inhibition of linoleic acid peroxidation, total flavonoids contents (TFC) and 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity.

Results: Antioxidant activities of EOs (HD and SD) and various extracts was evaluated by the measurements of reducing power, total phenolics contents (TPC), inhibition of linoleic acid peroxidation, total flavonoids contents (TFC) and 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity. Both EOs as well as extracts were observed to have a wide range of TFC (0.105-1.1312 mg/g catechin equivalents), TPC (0.0767-0.214 mg/g gallic acid equivalents), inhibition of linoleic acid peroxidation (28.36-49.28%), good reducing power and DPPH radical scavenging activity (IC₅₀) (19-87.5 µg m/L). Significant differences were observed in antioxidant activity of EOs as well as extracts depending upon the extraction technique. Extracts and EOs were also screened for the antimicrobial activity like minimum inhibitory concentration and disc diffusion assays against selected bacterial (*B. subtilis*, *E. coli*, *P. multocida* and *S. aureus*) and fungal strains (*A.flavus*, *G.lucidum*, *A. niger*). It was observed that EOs and extracts showed good antimicrobial activity against selected microorganisms except the extract prepared in n-hexane. Lemongrass EOs shows strong activity even in the presence of low concentration (8µL).

13. CHEMICAL BEHAVIOUR AND ORGANIC ELECTRONIC PROPERTIES OF FLUORENE CONTAINING CHROMOPHORE.

Rizwan Qayyum

Department of Chemistry, University of Sahiwal, Sahiwal

Objectives: The aim of this study is to synthesize fluorene derivatives which have notable optoelectronic properties.

Methodology:

Measures: The synthesized chromophore were analysed by spectroscopy (¹H-NMR and ¹³C-NMR) and spectrometry (EI-MS). The optical properties determined by UV-Vis spectroscopy, were from 394nm to 420nm.

Results: HOMO energy levels are -6.75eV to -7.15eV LUMO -4.08eV to -4.52eV with a band gap energy values 2.63-2.67eV, fluorescence ranged 48nm-113nm.

Implications: The band gap energy values suggest that these synthesized molecules can be helpful in the designing of green and blue OLEDs.

14. PERYLENE SYNTHESIS AND OPTOELECTRONICS PROPERTIES OF NOVEL PERYLENE BASED SOLUTION-PROCESSABLE DERIVATIVES.

Rizwan Qayyum^a, Nabeeha Nisar^a, Jamaluddin Mahar^{a,b,e*}, Muhammad Naeem Khan^{a*}, Ahmad Kaleem^a, Madiha Irfan^c, Aamer Saeed^b, Anila Iqbal^d and Kevin D. Belfield^e.

^aDepartment of Chemistry, University of Sahiwal, Sahiwal, Pakistan, ^bDepartment of Chemistry, Quaid-i-Azam University, Islamabad 44000, Pakistan, ^cDepartment of Basic Sciences and Humanities, Khwaja Fareed University of Engineering and Information Technology (KFUEIT), Rahim Yar Khan 64200, Pakistan, ^dNational Centre for Physics, QAU Campus, Shahdra Valley Road.P.O. Box No. 2141, Islamabad,44000, Pakistan, ^eDepartment of Chemistry, University of Central Florida (UCF), Orlando 162366, FL, USA ^dCollege of Science and Liberal Arts, New Jersey Institute of Technology, University Heights, Newark 07102, NJ, USA

Methodology:

Hypothesis: Duration of drug abuse problems, recovery period, number of treatment received for male family members, perceived stigma and quality of life will significantly predict caregiver stress in female close relatives of poly drug users

Sample: Novel series of organic compounds were synthesized from a perylene molecule by substituting at the bay and imide positions of perylene.

Measures: The synthesized compounds a-j was investigated by spectroscopic and elemental analyses techniques.

Results: These compounds were completely soluble in DCM and exhibited yellowish colour. Compound-g shows stoke shift 27 and bandgap of 1.7eV. From these results it is assumed that the compound-g can be used as a main component in the design of optoelectronics. On the other hand, compound-g shows higher Td(370°C) and Tg(132°C) values which displayed their high thermal stability.

15. EVERPRESENT IN THE CLOSED UNIVERSE

Muhammad Bilal Azam

Department of Physics, Lahore University of Management Sciences, Lahore, 54792, Pakistan.

Objectives: This study is the continuation of the model for a closed universe and its sensitivity is analysed under different orders of the radii of curvature.

Methodology:

Results: A variety of observations indicate that universe is accelerating and dark energy is thought to be the simplest candidate of cosmological constant, responsible for the positive acceleration but the problems of fine-tuning and coincidence are associated with it. To solve these problems, a fluctuating and time-dependent cosmological constant of the right order of magnitude was predicted in using the ideas from causal set theory and a more detailed phenomenological model was simulated numerically in for the spatially flat universe.

16. DESIGNING OF ZERO-INDEX METAMATERIALS USING 3D PHOTONIC CRYSTALS

Muhammad Umer Farooq

Lahore University of Management Sciences, Lahore

Methodology:

Research design: Photonic crystal to design zero refractive index metamaterials

Measures: Zero indexes metamaterial can be used as cloaking, super lenses, field concentration, light trapping and reflectors.

Results: Photonic crystal need accidentally induced Dirac like point at Brillouin zone center to behave as zero index metamaterials (ZIM). The effective ZIM can only be realized in photonic crystals with Dirac like point if all three of the following conditions are fulfilled simultaneously: (i) the DLP is formed by monopole and dipole moments, (ii) the DLP is at low enough frequency, and (iii) there is only one propagating band in the extended states above the DLP frequency.

17. GAUGE THEORY AND GAUGE TRANSFORMATION

Mr. Rehman Riaz

Department of Physics, University of Sahiwal, Sahiwal.

Objectives: To develop a theory for electroweak unification on the basis of Glashow model with the assumption all the particle are masses.

Methodology:

Research design: Gauge theory

Sample: massless particles

Measures: In this regard, we report SSE15206 as a novel compound that can causes aberrant mitosis resulting in G2/M arrest due to incomplete spindle formation, a phenotype often associated with drugs that interfere with microtubule dynamics.

Results: Electron positron collides to produce higgs boson. In third and second process are calculated on these values of center of mass energies ($\Gamma_s = 500\text{GeV}$, 1 TeV and 3 TeV). These all process is experimentally possible to study in future on international linear collider which is planned.

18. DESIGN, SYNTHESIS AND BIOLOGICAL SCREENING OF OXINO-BIS-PYRAZOLES

Miss. Aqsa Liaqat

Department of Chemistry, University of Sahiwal, Sahiwal.

Objective: Derivatives of oxino-bis-pyrazole has been aimed to synthesize and screen for biological studies.

Methodology:

Sample: A one pot synthesis of Oxino-bis-pyrazoles was designed by using precursors i.e. 3-methyl-1-phenyl pyrazoline-5-one.

Measures: A number of derivatives will be prepared via one pot condensation reactions of aryl aldehydes and 3-methyl-1-phenyl pyrazoline-5-one in environment friendly conditions.

Results: The successfully synthesized pyrazole derivative will be assayed for biological studies include anticancer, enzyme inhibition, antidangue etc.

19. SYNTHESIS AND CHARACTERIZATION OF AROMATICALLY DECORATED BIOLOGICALLY ACTIVE SCAFFOLDS

Mr. Hafiz Nawaz Hussain

Department of Chemistry, University of Sahiwal, Sahiwal.

Methodology:

Sample: Novel oxino bis-pyrazoles were designed for synthesis by two step reactions of 3-methyl-1-phenyl pyrazoline-5-one and aryl- or alkylaldehydes, in the presence of catalytic amounts of acid / base and ethanol as a solvent.

Measures: The newly synthesized compounds were proposed to be characterized by IR, NMR and Mass spectroscopy.

Results: All the synthesized compounds were proposed to be evaluated for their inhibitory activities against antiurease, butyrylcholinesterase (BChE) and bovine α -chymotrypsin. These compounds could be new candidates for the development of antiulcer drugs with their promising urease inhibition activity.

20. SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL STUDIES OF PYRAZOLE DERIVATIVES

Miss. Shumaisa Anwar

Department of Chemistry, University of Sahiwal, Sahiwal.

Objectives: Pyrazole derivatives were aimed to synthesize and characterized by analytical techniques such $^1\text{H-NMR}$, $^{13}\text{C-NMR}$, IR and mass spectrometry.

Methodology:

Sample: The 3,5-dimethyl-1,7-diphenyl-4-phenyl-8-oxo-1,2,6,7-tetraza-4,7-dihydro-1H-s-indacene was synthesized by using 3-methyl-1-phenyl pyrazoline-5-one and benzaldehydes as precursors.

Measures: Achievement of excellent yields was expected to obtain by using different acids and bases as catalysts.

Results: The synthetic compound will be further screened for biological activities to find lead compound for the development of new therapeutic agents.

21. AUTOMATIC SOLAR TRACKER USING ARDUINO UNO

Bismillah Mukhtar

Department of Physics, University of Sahiwal, Sahiwal.

Objectives: To construct such a system so that we can get maximum energy from sun by solar panels

Methodology:

Measures: We are trying to construct an automatic solar tracker which can sense maximum sunlight and rotate itself towards the direction of sun. In this way we can get maximum energy and utilize it for many purposes.

22. 3D CUBE LIGHT EMITTING DIODES

Alina Aziz

Department of Physics, University of Sahiwal, Sahiwal

Objectives: The main purpose of this project is to make Millar indices in the cube which is very important to study the solid material.

Methodology:

Sample: In making this project shift register, NPN transistor and Arduino UNO plays very important role in describing its working.

Results: Approaching from a combined attention in industry, complete 3-D cube turn a visually pleasing display, Proficient of creating a diversity of vibrant and unique graphic simulation in 3D space. Moreover, this project serve proof-of-concept, given that a wide-ranging assessment into a thrilling technology which is 3D display.

23. VOLTAGE CONTROL SYSTEM

Tayyeba Awan

Department of Physics, University of Sahiwal, Sahiwal

Methodology:

Research Design: These measurements are made using analogue and digital mixed signal processing

Measures: Current measuring technique is widely used in industry on sensing devices such as pressure sensors, flow sensors etc. Voltage control systems observes both voltages and current and take necessary actions as programmed.

Results: Voltages and currents are basic elements of any electrical and electronic system. Current and voltage measurements are mostly used in sophisticated measuring equipment such as Power supply, DC to DC converters, current to voltage amplifier. They provide an early warning if there is any supervisory control system that can detect the values of current and voltages according to the settings.

24. LINE FOLLOWING AND OBSTACLE AVOIDING ROBOT

Muzzamal Jabbar

Department of Physics, University of Sahiwal, Sahiwal

Objectives: To create unique robotic car which is much compulsory these days to prevent loss of time money as well as energy.

Methodology:

Results: These days many industries need robotic system to overcome the man works. Robotic system technology is much helpful in daily life. We create unique robotic car which is much compulsory these days to prevent loss of time money as well as energy. We discuss

the line following and obstacle avoidance robot. These days many industries need robotic system to overcome the man works. Robotic system technology is much helpful in daily life.

25. SLYER EXCITER, POWER FACTOR MEASUREMENT AND CONTROL SYSTEM

Hamza Khalid

Department of Physics, University of Sahiwal, Sahiwal

Objectives: In this project, we will come to know about the power factor but also observers the real power, apparent power, current value and how much power we have lost.

Methodology:

Sample: A slyer exciter is an air-cored transformer that steps up a very low DC voltage to a very high AC voltage.

Measures: An electromagnetic field around the coil is capable of lighting up fluorescent and neon light bulbs. It is fairly similar to a Tesla coil.

Results: Power factor measurement and control system is the necessary part of any electrical system. It is used to enhance the voltage which is reduced due to high loads mostly at industrial areas. Its power factor system saves the electric components. It saves the power loss.

Conclusion: This device can save the electricity by using it at high level.

26. SYNTHESIS, SPECTROSCOPIC AND ELECTROCHEMICAL STUDIES OF PERYLENE BASED AZO HYBRID DYE

Bushra Latif, Sajjad Rashid, Ahmad Kaleem, Jamaluddin Mahar, Muhammad Naeem Khan, Aamir Saeed

Small set of perylene based chromophore coupled with azo derivatives and there electrochemical and spectroscopic studies. Substitution reaction of tetrachloroperylene-3,4,9,10 -bisdimide 3 with phenolic azo dyes in basic medium was used for hybridisation of perylene bis dimide. They exhibited azo linkage and highly conjugated framework of π bonds. They show sharp emission spectra of fluorescence in water. The structures of perylene azo dyes were elucidated by FTIR and NMR spectroscopy.

Keywords: Perylene, bisimide, azo dyes, flouresence.