Chemistry Department

College of Science

King Khalid University

Contents

Foreword

Department of Chemistry was established as one of the departments of the College of Education in Abha in 1396 (1976), where the number of students at that time not to exceed ten students. Now the Chemistry Department has become one of the largest departments in the College of Science, King Khalid University. The Chemistry Department offers Bachelor of Science degree (BSc) an Master of Science degree (MSc) in Chemistry. The Chemistry Department supports and serves other colleges such as College of Medicine, College of Pharmacy, Colleges of Engineering , College of Education and others.

Chemistry Department currently comprises a group of member of staff, and are distributed in different areas of chemistry with a variety of specialties and their research interests, they supported by a number of lecturers and teaching assistants and technicians. The Chemistry Department divided into six major branches including Analytical Chemistry, Biochemistry, Chemometric Chemistry, Inorganic chemistry, Organic Chemistry and Physical Chemistry.

Chemistry is often called "the middle Science" or " the Central Science " and so can mediate between the other sciences, Chemistry is essential to our understanding of the natural world around us, the interpretation of many natural phenomena and it is basic for a number of sciences such as medicine, pharmacy, biotechnology, physics , biology, geology and mining and many others.

Chemistry Department currently in total has 18 laboratories; which nine teaching laboratories dedicated mainly for students of the undergraduate program in the College of Science and colleges served by the department. Seven research laboratories equipped with a good number of modern instruments dedicated to the research members of staff and graduate students. And two laboratories for female graduate students equipped with most major equipment and a number of scientific instruments necessary to accomplish their projects research. The Department includes an integrated unit for a nuclear magnetic resonance (NMR), which receives samples other departments at the university for analysis.

Dr. Abdullah M. Alhanash

Head of Chemistry Departmen

King Khalid University (KKU)

Establishment

- **KKU was established /01/1419 AH (06/05/1998 AD) by merging Imam Mohammad Ibn Saud Islamic University and King Saud University in the Southern Region into one entity under the new identity of 'King Khalid University'.**
- **On 11/3/1419 AH (6/7/1998 AD), a Royal Decree, Decree 7/78/M was issued to complete all regular procedures necessary to effect the merger.**
- **The KKU's first budget was issued on 14/09/1419 AH (02/01/1999 AD) within the general state budget.**
- **Current capacity is more than 72000 students; with more than 7000 personnel and member of staff.**

Colleges in KKU

- **KKU comprises of about 50 colleges: half colleges for males and other colleges for females. All colleges are distributed over 13 locations in Aseer province.**
- **Males colleges are: Sharia and Fundamentals of Religion, Education, Medicine, Financial and Administrative, Applied Medical Sciences (2), Humanities, Science , Engineering, Languages & Translation, Pharmacy, Dentistry, Nursing, Arts and Science(4), Community (3) and computer Sciences.**
- **Females colleges are: Centre for Girls' study, Community (3), Science, Arts and Education (2), Arts and Science(6), Education for preparing females teachers, Applied Medical Sciences (3), Health sciences, Education and Science and Home economics**

College of Science

- **College of Science comprises of 4 departments: Biology, *Chemistry*, Mathmetics and Physics**
- **There are 1520 students in the college of science in Abha ; in Chemistry Department there are381 students, 53 member of staff; including 35 P.hD holders.**

Chemistry Department

Vision:

Chemistry Department is looking forward to achieve a regional leadership by qualifying distinguished chemists, delivering researchs with high quality in several areas of the chemistry and actively contributes to the development of society.

Mision:

Chemistry Department is committed to create an optimum academic and administrative environment through:

- **Building educational programs of high quality to develop the knowledge and skills**
- **Recruiting qualified academics and professionals and strive for their continued development .**
- **Encouraging scientific research and its applications in various fields of chemistry and providing the means.**
- **Ensuring the application of comprehensive quality standards in each action in Chemistry Department**
- **Encouraging and inducing the social and cultural activities in the department**
- **Contributing to Community Services and development.**

Aims:

- **The chemistry department will prepare young Saudis to work as specialists and researchers in the public and private sectors with the opportunity for outstanding students to work in the department as lecturers to complete their higher education**
- **The Department of Chemistry teaches general chemistry, organic chemistry and analytical chemistry for the students of the College of Medicine, College of Pharmacy, College of Medical Laboratory and the College of Engineering**
- **Chemistry department provides scientific services and consultations to government institutions and private sectors.**
- **Chemistry department provides chemical analysis for water and soil samples which required by government institutions, private sectors and individuals.**
- **The Department of Chemistry organizes scientific seminars and workshops to discuss cutting edge knowledge in different branches of chemistry.**
- **Some member of staff carry out scientific research in various fields of chemistry**

1. Analytical Chemistry
2. Biochemistry
3. Chemometric Chemistry
4. Inorganic Chemistry
5. Organic Chemistry
6. Physical Chemistry

1- *Nuclear Magnetic Resonance (NMR)*
2- *Liquid Chromatography tandem Mass Spectrometry (LC-MS/MS)*
3- *Inductively Coupled Plasma Mass Spectrometry (ICP-MS)*
4- *Scanning Electron Microscope (SEM)*
5- *X-ray Diffractometer*
6- *Gas Chromatography Mass Spectrometry (GC-MS)*
7- *Gas Chromatography (GC)*
8- *High Performance Liquid Chromatography(HPLC)*
9- *Atomic Absorption Spectroscopy (AAS)*
10- *Flame Photometry (FP)*
11- *UltaVolilet/Visible Spectrophotometer (UV/VIS)*
12- *Fourier Transform Infrared Spectroscopy (FT-IR)*
13- *Potentiostat*
14- *Thermogravimetric analysis (TGA)*
15- *Differential Thermal Analysis (DTA)*
16- *Differential Scanning Calorimetry(DSC)*
17- *Instrument for Solar Cell*
18- *Tube furnace for production of Activated carbon*
19- *Spectrofluorometer*
20- *Lumina Fluorescence Spectrometer*
21- *Elemental Analyzer*
22- *DV-E Viscometer*
23- *Parr 4848 Reactor Controller*
24- *Microwave Digestion*
25- *Refrigerated Table Top Centrifuge*
26- *Freeze-dryer*
27- *Accelerated Solvent Extractor*
28- *Rotovapor*
29- *Biosafety Cabinet*

1- Nuclear Magnetic Resonance (NMR)

Description:

- **NMR spectrometer.**
- **Bruker DRX 500 MHz Nuclear Magnetic Resonance Spectrometer.**
- **500 MHz NMR with cryoprobe**

Applications:

- **Measurement of organic *compounds***
- ***Structural analysis of organic molecules.***

2- Liquid Chromatography tandem Mass Spectrometry (LC-MS/MS)-•Xevo TQD Waters

Description:

- **Xevo TQD Waters Acquity Tandem Mass Spectrometer (LC-MS/MS)**
- **IonBench - Waters XEVO TQD LC/MS system**
- **Connected with an Acquity UHPLC**
- **Installed on a IonBench MS (Mass Spec)**

Applications:

- ***Routine quantitative analysis***
- ***Molecular measurement of environmental samples.***
- ***Molecular measurement of biological samples.***

3- Inductively Coupled Plasma Mass Spectrometry (ICP-MS)*- iCAP Q ICP-MS - Thermo Scientific

Description:

- **iCAP Q ICP-MS - Thermo Scientific**
- **The facility hosts 2 multi-collector inductively coupled plasma mass spectrometers (Thermo Neptune Plus; Nu Plasma II),**
- **X-series-2 Q-ICPMS quadrupole inductively coupled plasma mass spectrometer (Thermo),**
- **Thermo Triton thermal ionisation mass spectrometer (TIMS),**
- **Argon fluoride 193nm excimer laser system (Coherent COMPex Pro 110).**

Applications:

- ***Single figure ppt detection limits for low mass elements such as Li,***
- ***Be and B in He KED mode allow for full mass range analyses in a single He KED mode.***
- ***Elementary measurement in environmental samples.***
- ***Trace elements analysis in biological samples.***
- ***Heavy and toxic metals in foods and water samples.***
- ***Metal speciation in different types of samples.***
- ***Food quality control and geochemical exploration***
- ***Ultra-trace analysis in the semiconductor industry***

* ***Ready in boxes for installation***

4- Scanning Electron Microscope (SEM)

Description:

- ***Scanning Electron microscope***
- ***The JSM-6390LV is a high-performance, low cost, scanning electron microscope with a high resolution of 3.0nm. Low Vacuum mode: 4.0 nm***
- ***Magnification x5 to 300,000***
- ***Live, full screen image***

Applications:

- ***Elemantal analysis***
- ***Biological sample analysis***
- ***Environmental samples analysis***

5- X-ray Diffractometer (XDR6000)

Description:

- ***Shimadzu XDR600 has most stable hardware.***
- ***Shimadzu XDR600 has more capabiliy***
- ***Shimadzu XDR600 has use friendly software***

Applications:

- ***Elemantal analysis***
- ***Biological sample analysis***
- ***Environmental samples analysis***
- ***Geological samples analysis***
- ***Soil, rocks, clay, minerals, construction, civil engineering, environment and industrial waste***

6- Gas Chromatography Mass Spectrometry (GC-MS)

Description:

***Varian Saturn 2100T Gas Chromatograph / Mass Spectrometer*:**

- **Tturbomolecular pump (m/n SATPRO1) complete**

with Varian CP-8400/CP8400 autosampler (100 x 2 mL vials),

- **Varian 3900 GC-gas chromatograph (compact column oven (5.5L) with up to 7 ramps per method),**
- **Varian DS 102 rotary-vane pump, new PC,**
- **Varian Scanview 7.0 software, Varian MS Workstation 6.2 software and manuals.**
- **The ion trap mass spectrometer has a reliable, simple internal ionization analyzer with Standard EI full scan operation.**
- **Programmed acquisition enables PC controlled changes between all modes of operation (EI to CI and MS to MS/MS).**

Applications:

- ***Volatile compounds analyis in:***
- ***Environmental samples analysis***
- ***petroluem sample analysis.***

7- Gas Chromatography (GC)

Description:

Cas Chromatography: GC-2014 - Shimadzu Scientific Instruments:-

- **Improved design and innovative technology for all of our injectors,**
- **Large LCD, all digital gases contr ol and auto-diagnostics inherited from the GC-2010 – "The Most advanced, easy-to-use interface"**
- **Use any column types for any analysis. Packed or capillary columns give you the freedom to choose the best technique for your measur ement.**
- **Digital carrier gas control**

Applications:

- ***Volatile compounds analysis in petroleum samples.***
- ***High efficiency separation and identification of gaseous and volatile liquid mixtures.***

8- High Performance Liquid Chromatography(HPLC)

Description:

- *Shimadzu HPLC System SCL-10A SPD-10A LC-10AS SIL-10A Autosampler*
- *Shimadzu SCL-10A System Controller*
- *FRC-10A Fraction Collector.*
- *UV-VIS detector.*
- *Shimadzu SCL-10A System Controller: the SCL- 10A controls several components including FRC-10A, LC-10AD, SIL-10A, CTO-10A, SPD-10A, and other pumps, fraction collectors, autoinjectors, column ovens and UV-VIS detector.*

Applications:

- *Non-volatile compounds analysis in pharmaceutical samples.*
- *High efficiency separation and identification of liquid mixtures*
- *Food samples analysis*
- *Pharmaceutical samples analysis*

9- Atomic Absorption Spectroscopy (AAS)

Description:

- *The SpectrAA-220 FS measures samples element by element*
- *FAAS (Flame Atomic Absorption Spectroscopy) is a fast and easy technique with an extremely high sensitivity*
- *Detection limits for flame AAS vary enormeously: from 1 - 5 ppb (e.g. Ca, Cd, Cr, Cu) to more than 1000 ppb (e.g. P). Some elements (e.g. B, C, Br) cannot be measured at all.*
- *The most courant gas mixtures used are air/acetylene and nitrous-oxide/acetylene.*
- *A disadvantage of the AAS technique is the non linearity of the calibration curves when absorbance become higher than 0.5 to 1.*

Applications:

- *Heavy and trace metals analysis, including lead, copper, silver, mercury, arsenic, and others in environmental samples.*

- *Sensitive especially for elements like Pb, Cd, Cu and Cr*

- *Environmental samples analysis*

10- Flame Photometry (FP)

Description:

- **TJENWAY: Flame Photometer will run on Butane, Propane, or a mixture of the two, and Natural gas.**
- **A Primary Regulator at the gas source is required and can be supplied by Sherwood.**

Applications:

- **Alkali and alkaline earth metals (Na, K, Li, Ca, Sr, Cs, Ba and Rb) analysis in aqueus samples.**
- **Alkali and alkaline earth metals in different drinks samples.**

11- UltaVolilet/Visible Spectrophotometer (UV/VIS)

Description:

- **The Shimadzu UV-1601 PC is a UV/Visible double beam spectrophotometer.**
- **Wavelength Range: 190-1100 nm**
- **Photometric Range: Absorbance of -0.5~3.999 Abs / Transmittance of 0.0~300%**
- **UV Probe Software not include**

Applications:

- **Quantitative analysis of coloured solutions for transition metal ions**
- **Analysis of organic compounds with conjugation bonds**

12- Fourier Transform Infrared Spectroscopy (FT-IR)

Description:

Fourier Transform Infrared Spectrometer FT/IR). The new FT/IR-460Plus series has been designed for efficient and user-friendly routine analysis.

- High S/N Ratio

- Newly developed KRS-5 windows

- Quick Start button

- Auto Recognition Accessory System

- Simple operation mode

Applications:

-Structural analysis of organic molecules.

- Identification of inorganic compounds and organic compounds

- Identification of components of an unknown mixture

-Analysis of solids, liquids, and gasses

13-Potentiostat (Autolab)

Description:

- **Autolab PGSTAT30 Potentiostat**
- **Autolab/PGSTAT302N is a modular high current potentiostat/galvanostat with a maximum current of 2 A (20 A with BOOSTER 20A) and compliance voltage of 30 V.**
- **Potentiostats / galvanostats. AUTOLAB PGSTAT100. This is a modular high voltage potentiostat/galvanostat capable of measuring or applying a maximum current.**

Applications:

- **Electochemical experiments**
- **Voltammetric analysis**

14- Thermogravimetric analysis (TGA)

Description:

- **Model: TGA-51**
- **Provider: Shimatzu**
- **Specifications**
- **Temperature Range: Ambient to 1500°C**
- **Weight measuring range: 20mg, 200mg, 2g**
- **Readability: 0.001mg**
- **Sample mass: 10g including tare**
- **Programmable heating rate: 0.1°C/hour to 99.9°C/min**
- **Hold time: 0 to 999min, 0 to 999hour**
- **Temperature program format: 99 steps maximum**
- **Temperature program file: up to 100 files**
- **Cooling method: Air-cooled**
- **Signal output: Analog and digital**
- **Atmosphere control: Built-in gas flowmeter (250ml/min maximum)**

Applications:

- **TGA is a powerful technique in materials characterization**
- **TGA records the changes in physical and chemical properties as a function of temperature through recording the mass change during heating under certain conditions.**

Different phenomena can be studied by using TGA such as: vaporization, sublimation, dehydration, decomposition, oxidation …. Etc

15- Differential Thermal Analysis (DTA)

Desription:

- **Provider: Shimatzu**
- **Model:DTA-50**
- **Specifications:**
- **Temperature range: Room temperature to 1500°C**
- **Measurement range: ±0.2 to ±1000 µV (from ±0.2 mW)**
- **Heating speed: 0 to +50°C/min**
- **High temperature heat flux DTA, provides quantitative calorimetric measurements, quick response and high sensitivity accurate temperature control high temperature**

Applications:

- **Differential thermal analysis (DTA) is a thermal analysis technique, in which, the exothermic or endothermic changes can be measured.**
- **The technique is based on heating the material in a heating cycle and use a reference sample to undergo the same heating cycle, the detector can then identify any temperature difference between the material and the reference sample.**
- **DTA provides a useful data about the transformations in a certain material such as glass transitions, crystallization, melting and sublimation.**
- **Furthermore, DTA provides data about the enthalpy change of the material.**

16- Differential Scanning Calorimetry(DSC)

Description:

- **Model: DSC-60**
- **Provider: Shimadzu**
- **Specifications:**
- **Temperature range: Room temperature to 1000°C**
- **Measurement range: ±20, ±200, ±2000 mg**
- **Maximum sample weight: 10g**
- **Airtight design safely performs measurements in hydrogen atmosphere**
- **Different sample crucibles**

Applications:

- **Differential Scanning Calorimetry (DSC), is a fast and ease thermal analysis technique which can identify the phase transitions.**
- **DSC records the changes in the heat capacity of the materials as a function of temperature compared with a reference sample.**
- **DSC is used to detect different changes in the material such as phase changes, melts, glass transitions, and curing.**
- **DSC is widely used for several industrial applications in which the materials exhibit some sort of transitions such as: pharmaceuticals, polymers, food, paper, printing, manufacturing, agriculture, semiconductors, and electronics as most materials**

17- QE/IPCE measurement System

Description:

- **Preselected components for the solar cell QE/IPCE measurements**
- **Simple, yet flexible software that measures QE with a simple configuration setup**
- **300 W Xe light sources**
- **All components from Newport which makes support easy**
- **Digital lock-in measurements with a NIST calibrated detectors over the 350 – 1100 nm range**
- **Solar cell fixture available**

Applications:

- **Measurements can be made on a wide range of solar cell materials, such as:**
  - **Monocrystal silicon, polycrystalline silicon, α-Si, GaAs, GaInP, InP, Ge, CdTe,**
  - **CIS, CIGS, DSSC, Organic Solar Cell, Polymer Solar Cell.**
- **In addition the system is also applicable for a variety of solar cell structures,**
  - **for example: Single junction, multi-junction, HIT, thin film, HPV and so on.**

18- Three Zones Split Tube Furnace with Optional Quartz Tube Flanges

Description:

- **36" Three Zones Split Tube Furnace with Optional Quartz Tube Flanges**
- **(3.14" to 5" O.D, 1200°CMax) - OTF-1200X-III**
- **Temperature Controller: PID automatic control with 30 programmable segments for precise control of heating rate, cooling rate and dwell time.**
- **Heating Temperature: Max. Heating Temperature: 1200°C**
- **Continuous Heating Temperature: 1100°C**
- **Max. Heating Rate: 20°C/min**

Applications:

- **Tube furnace to be use in production all souces (biomaterials and animals) of activated carbons (AC)**
- **Activated carbon (AC) is the most versatile and frequently used sorbent for the treatment of water and wastewater. This is due to its large internal surface area and pore volume, and its ability to absorb organic vapors , organic dyes , heavy and toxic elements from their waste at low cost.**

19-Spectrofluorometer (shimadzu rf-5301pc)

Description:

High-Sensitivity; High-Speed Scanning; Versatile Sample Compartment Size; Built-In Performance Checks and Windows-Based Workstation
3 Measurement Modes:

- **Spectrum Measurement Mode**
- **Quantitative Measurement Mode**
- **Time Course Measurement Mode**

Applications:

1-Life Sciences

- **Amino acids, peptides, proteins, fats, sugars, vitamins, Coenzymes and amines, antibiotics,**

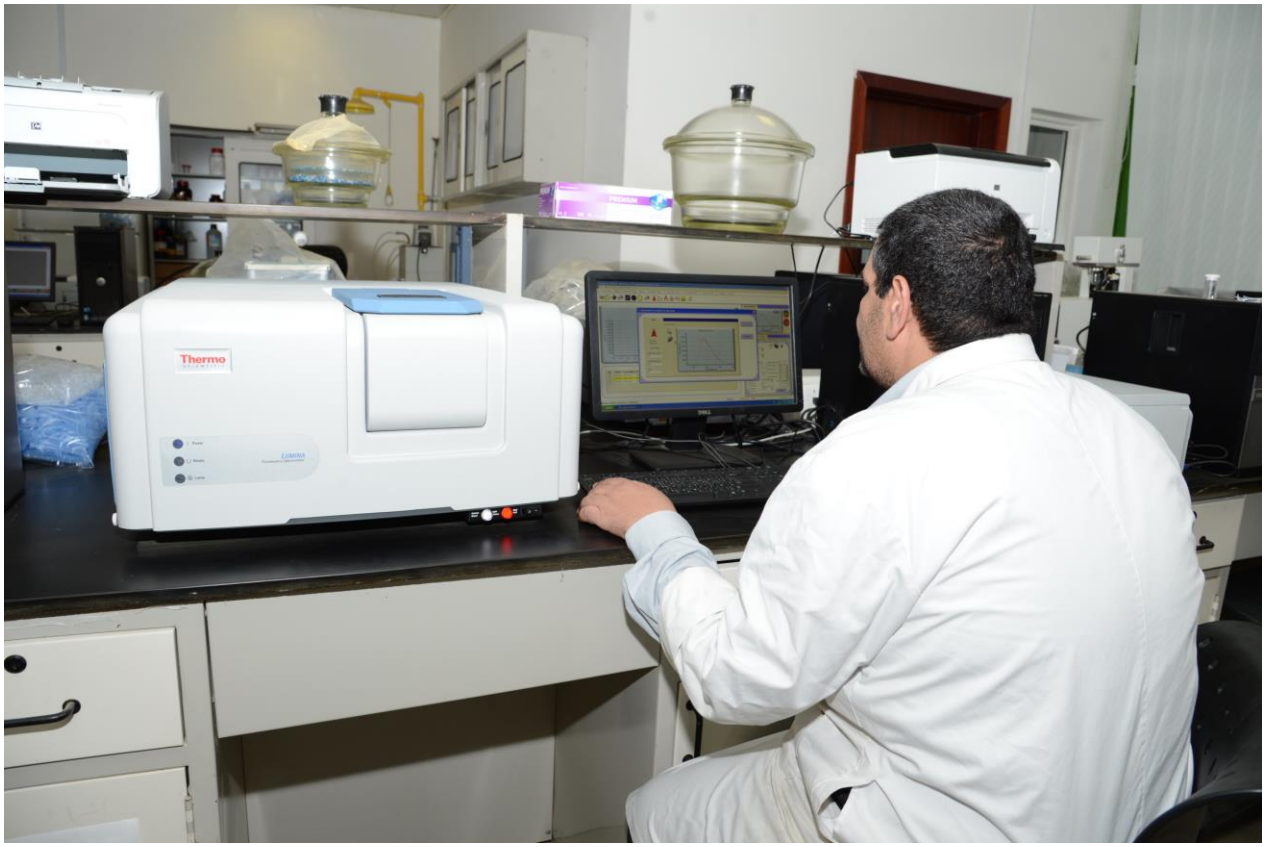
2- Food Products

- **carbohydrates, food additives (such as flavorings, seasonings, and antioxidants), cooking oil (such as vegetable oils and animal oils), and pesticides (carbamate, organophosphorus, and 1-naphthylacetic acid)**

-Food ingredient analysis and quantitative analysis
-Inspections for residual pesticides
3-Chemicals / Environment

- **Organic, inorganic, and polymer compounds (such as fibers, plastics, and rubbers)**

20- Lumina Fluorescence Spectrometer



Description:

The Lumina fluorescence spectrometer is designed to give you the research-quality data you demand.

- **The resourceful Thermo Scientific Luminous software makes data acquisition, analysis and reporting straightforward.**

Useful features of the system include:

• Make fluorescence, chemiluminescence or phosphorescence measurements with sophisticated instrument control options • An excitation shutter helps protect precious, photosensitive samples

• Measure total fluorescence with zero-order options for both excitation and emission monochromators

Applications:

-Wave Scan Module

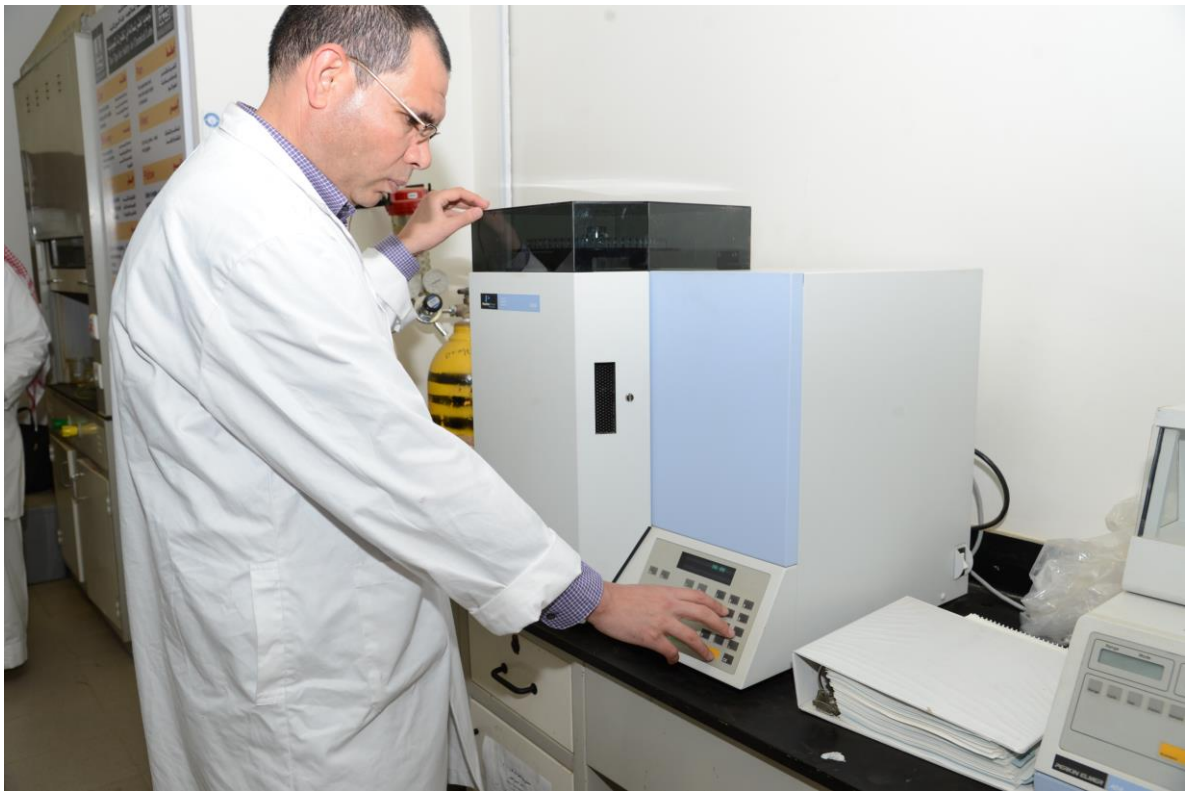
- Time Scan Module

- 3D Scan Module

-Quantification modules

- Data Processing and Convenience Features

21- Elemental Analyzer



Description:

- **2400 Series II CHNS/O Elemental Analysis**
- **Organic Elemental Analysis**
- **Perkin Elmer 2400 Series II CHNS/O Elemental Analyzer is a powerful instrument for the rapid determination of Carbon, hydrogen, nitrogen and oxygen, .**

Applications:

- **One analyzer with three modes of operation: CHN, CHNS and Oxygen**
- **Advanced combustion design for handling virtually any type of sample**
- **Frontal Chromatography for simple, reliable and accurate measurements**

22- DV-E Viscometer

Description:

- **BROOKFIELD DIGITAL VISCOMETER**
- **The *Brookfield DV-E Viscometer* measures fluid viscosity at given shear rates.**
- **Speed up to 100 rpm**
- **Temperature working range 0 – 40^{0}C**
- **Autorange and CGS or SI Units Selection**
- **SPEED/SPINDLE SWITCH: Sets the viscometer in either speed select or spindle select**

Applications:

- **Viscosity measurement of various liquids**

23- Parr 4848 Reactor Controller

Description:

- **Parr Mini, Bench Top reactor model 4560 capacity of 300ml**
- **Up to 200 bars and 350C**
- **Equipped with temperature controller 4880**

Applications:

- **Use for multiphase reactions as gas-liquid-solid ,**
- **Gas-liquid or gas -liquid-liquid reactions**

INSTRUMENTS

for

SAMPLES

PREPARATION

24- Microwave Digestion

Description:

- **Multiwave PRO: High-performance rotors; Wide range of vessels and accessories Maximum configuration and application options**
- **High Pressure Asher HPA-S: Unlimited digestion time; The highest digestion reproducibility due to direct sample- and acid-independent heating of all reaction vessels**
- **Multiwave ECO: Simple operation, long-life 3-part vessels; Reaction control based on all vessel temperatures; Pressure-activated venting allowing high sample volumes**

Applications:

The Multiwave PRO microwave reaction system serves two groups:
1-professionals in trace analysis
2-Synthetic chemistry.

- **Sample Preparation of Food Samples**
- **Sample Digestion Systems for Cosmetics**
- **Salinity in Crude Oil**
- **Enviromental Sample Preparation**
- **Phosphorus in Cereal Crops**
- **Ensure the Safety of Herbal Drugs**
- **Determination of Brominated Flame Retardants**
- **Ashing and Digestion of Pharmaceuticals with Microwave-induced Oxygen Combustion**
- **As and Se in Foodstuff | High-performance Digestion with High Pressure Asher HPA-S**

25- Refrigerated Table Top Centrifuge (Sigma 3-30K)

Description:

Sigma 3-30K Refrigerated Table Top Centrifuge, Spincontrol Comfort, 220-240V, 50 Hz

- **High speed refrigerated bench top centrifuge for maximum speed 30000 rpm, gravitaional fields up to more than 65000 × g**
- **Brushless drive practically maintenance free**
- **Reliable drive system**
- **A microcontroller controls time, temperature, speed or g-force**
- **Self explaining control unit Spincontrol Comfort**
- **Illuminated symbol keys start, stop, lid open**
- **Window in the centrifuge lid for external speed control**
- **Very low noise level**
- **Possibility of precooling rotors during standstill, refrigerant R404a, (CFC-free)**
- **Lid can easily be opened due pneumatic spring support**
- **Two motorised lid locks**
- **Magnetic rotor identification prevents the rotor from overspeeding**
- **Stainless steel bowl**
- **Imbalance switch**
- **No need to open the casing for emergency lid lock release**
- **Produced according to national and international safety regulations (eg, IEC 61010)**

Applications:

- **Environmental and biological samples preparations**

26- Freeze-dryer : EYELA, FDU-1200

Description:

- **Benchtop Freeze Dryer. Trapping temperatue is up -45ºC and ice holding capacity is 1L/time.**
- **Automatic vacuum leak valve**
- **rap temperature: 1ºC/mV, vacuum degree:1Pa/mV**

27- Accelerated Solvent Extractor (Dionex - ASE 350)

Description:

- **The Thermo Scientific™ Dionex™ ASE™ 350 Accelerated Solvent Extractor system is a patented system for the extraction of solid and semisolid samples using common solvents at elevated temperatures and pressures. The Dionex ASE 350 system can automatically extract up to 24 samples, using less solvent and labor, and accommodates 1, 5, 10, 22, 34, 66 and 100 mL cell sizes.**

- **Automatically extract up to 24 samples (1–100 grams each).**
  - **Faster than Soxhlet, sonication, and other extraction methods.**
  - **Requires less solvent and labor.**
  - **Accommodates 1, 5, 10, 22, 34, 66 and 100 mL cell size**

Applications:

- **Automated sequential solvent extraction system with a carousel that holds up to 24 samples.**
- **Integrated solvent controller allows mixing and delivery of up to three solvents.**
- **Specialized oven design ensures uniform heating and control of temperature for the extraction cell. This ensures uniform extraction from cell-to-cell and batch-to-batch.**
- **SmartRun™ system ensures cell size and collection vessel size are matched for a successful extraction.**
- **pH hardened pathway with Dionium™ components and cell make accelerated solvent extraction compatible with acid or alkaline pretreated matrices.**
- **Flow-through technology allows in-line filtration and in-cell clean-up.**

28- Rotovapor (BUCHI)

Description:

- **Rotary Evaporation by BUCHI**
- **The lab-scale Rotavapor® R-210/R-215**
- **with an evaporation flask size from 50 ml up to 5'000 ml - built on unmatched technology.**

Applications:

Its application associated with solvents evaporation and it is used for:

- **Distilling solvents**
- **Vaporizing solvents**
- **Recrystalization**
- **Synthesis and cleaning of Chemicals**
- **Soxhlet extraction**
- **Drying powere by means of drying flask**

29- Labconco Biosafety Cabinet

Description:

- **Purifier Logic Class II Biological Safety Cabinets provide personnel, product**
- **environmental protection from hazardous particulates such as agents that require Biosafety Level 1, 2 or 3 containment. Purifier Cell Logic Class II**
- **Biological Safety Cabinets are biosafety cabinets with specialized features forcell research.**
- **Both Logic and Cell Logic biosafety cabinets are available in Type A2 and B2.**
- **Purifier Delta Series Biosafety Cabinets have been discontinued and replaced by the Purifier Logic Class II Biosafety Cabinets.**

Helping students from public education to carry out some experiments to understand the surrounding nature.

Scocial Engagement Ccommittee

Community service programme of the department of chemistry:

The objective of this program is to adopt some projects to serve the university and Aseer communities.

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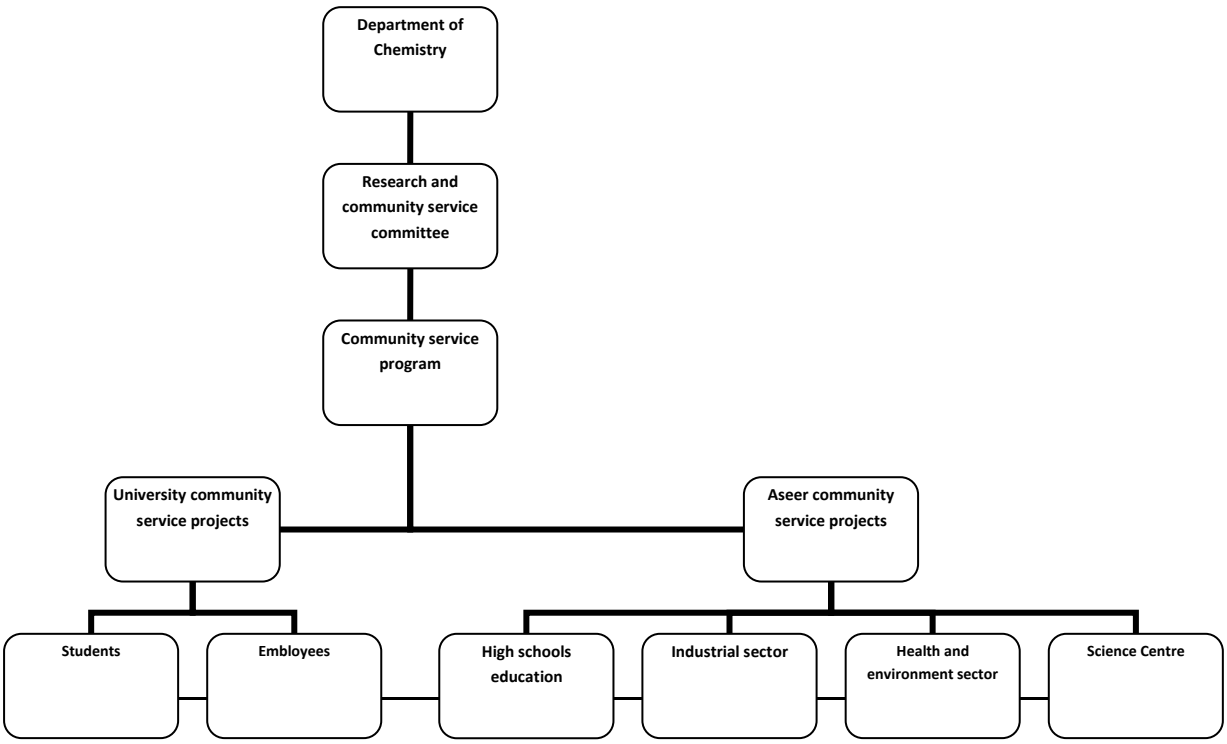
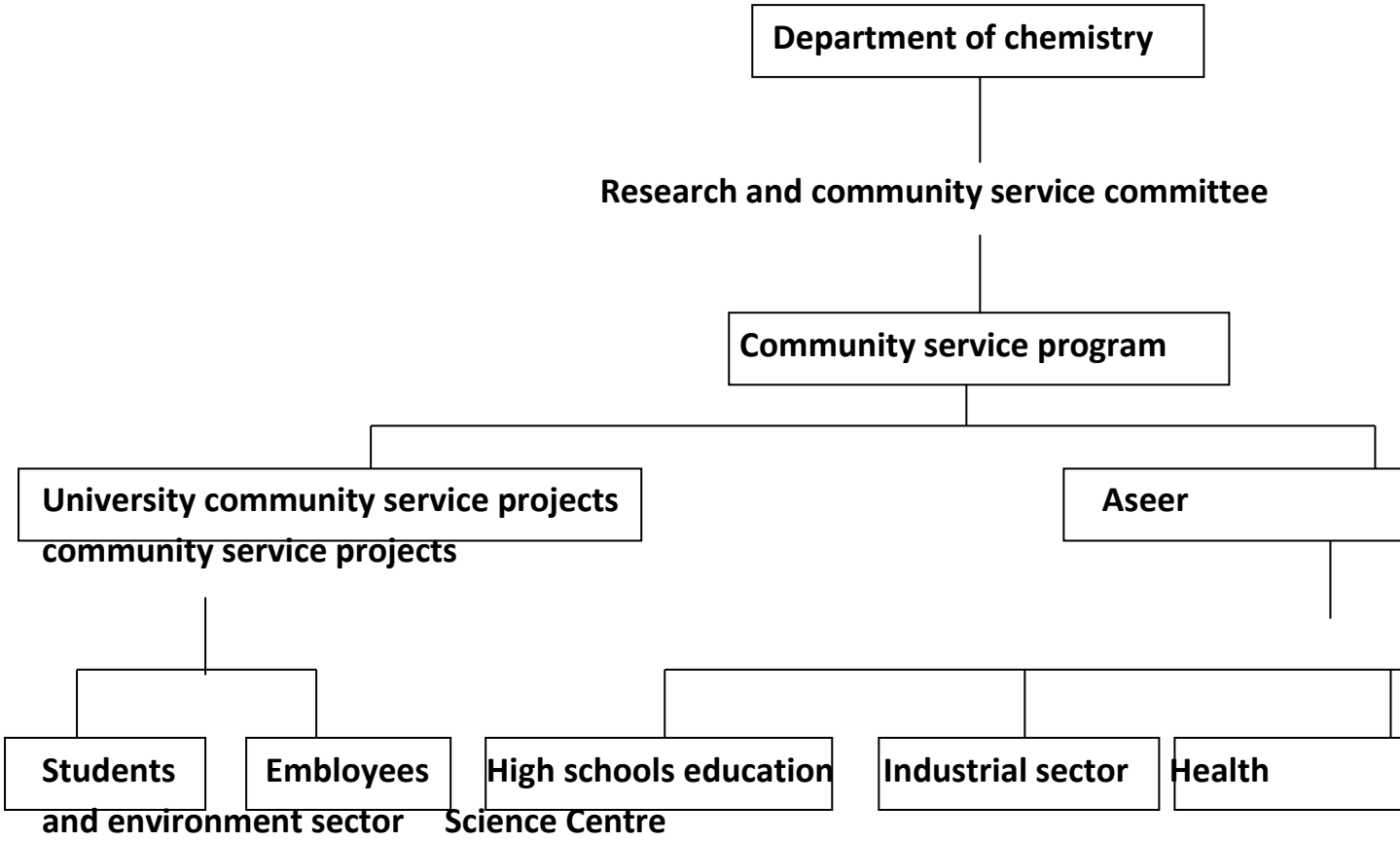
Organizational chart of the programme




Department of chemistry
Research and community service committee
Community service program
University community service projects
Aseer
community service projects
Students
Embloyees
High schools education
Industrial sector
Health
and environment sector
Science Centre

Current Research Activities

(1)Project name: Detection of cytological changes in the Oral Mucosa among Local users of Tobacco in Najran in the KSA

Supported by: King Abdulaziz City for Science and Technology (**KACST**); AT-34-87,

Authors: **Brima, E. I., (P.I)**, Anass Mohamed Abbas, Hussian Gadelkarim Ahmed, Manar Gaffar Shalabi.

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(2)Project name: Activated carbon from date pits to be used for removal of heavy , toxic elements andorganic dyes from well water at Asser Region: Use of Treated Date Pits and Camel Bones in the Purification of Waste- and Well-waters in Aseer Area

Supported by: King Abdulaziz City for Science and Technology (**KACST**); A-L-12-902

Authors: **Nasser Awwad (P.I.)** , Ahmed A. Omran, Hesham Salah, Ayed El-Shihri, Khalid Fahmy.

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(3)Project name: Utilization of Nanoporous Sorel's Cement as an Adsorbent Material in the Removal of Heavy Metals and Organic Dyes from Ground and Sewage Waters in Aseer Area

Supported by: King Abdulaziz City for Science and Technology (**KACST**) & National Plan for Science, Technology and Innovation (**NSTIP**); 12NAN457-07.

Authors: **Nasser Awwad (P.I.)** , Ahmed A. Omran, Hesham Salah

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(4)Project name: Production of Saudi Reference Materials

Supported by: King Abdulaziz City for Science and Technology (**KACST**)

Authors: **Abubakr M. Idris (P.I.),** Ahmed O. Alnajjar

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(5)Project name: Developing Inexpensive Green Rapid Method for the Quantification of Fexofenadine and Pseudoephedrine in their Combined Formulations Exploiting Sequential Injection Chromatography

Supported by: Deanship of Scientific Research, King Khalid University (KKU); KKU-DSR-111

Authors: **Abubakr M. Idris (P.I.)**

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(6)Project name: Developing Inexpensive Green Rapid Method for the Quantification of Fexofenadine and Pseudoephedrine in their Combined Formulations Exploiting Sequential Injection Chromatography

Supported by: Deanship of Scientific Research, King Khalid University (KKU); KKU-DSR-111

Authors: **Abubakr M. Idris (P.I.)**

(7)Project name: Determination and Human Risk Assessment of Heavy Metals in Edible Fishes in Abha City Caught from Jazan, Red Sea
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**)
Authors: Tarek O Said (P.I.), Ahmed A. Omran, Abubakr M. Idris, Khalid Fahmy

(8)Project name: Levels of toxic heavy metals in fruits and vegetables in the region of Asir
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**)
Authors: Mohammed Z. Oteef (P.I.)

(9)Project name: Synthesis, characterization, and anticancer evaluation of sulfonamide schiff's bases and some of their metal complexes
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**); KKU-S165-33
Authors: Ahmed Mohamed Ramadan Elsayed (P.I.)

(10)Project name: Molecular Structure and Complex Formation Equilibria of Some Antioxidants Spreads in the Plants in Saudi Arabia with Platinum, Vanadate Metal Ions, and Naringin
Supported by: King Abdulaziz City for Science and Technology (**KACST**); MS-34-63
Authors: Ahmed E. Fazary (P.I.)

(11)Project name: Bioproduction and Synthesis of Novel Safe Potential Readily Biodegradable Chelating Agents
Supported by: King Abdulaziz City for Science and Technology (**KACST**); MS-34-41
Authors: Ahmed Fazary (P.I.) , Ayed Alshiri

(12)Project name: Complexation Studies of Some B-Complex Vitamins and Glycine Peptides
Supported by: King Abdulaziz City for Science and Technology (**KACST**); P-S-12-0017
Authors: Ahmed Fazary (P.I.) , Aisha Rajhi

(13)Project name: Molecular Structure and Complex Formation of Iron, Calcium, and Zinc with Vitamin B9 and Glycine: Is Iron, Zinc, and Calcium Tablets Interfere Vitamin B9 Supplement in Pregnancy?
Supported by: King Khalid University (**KKU**); KKU-S085-33
Authors: Ahmed Fazary (P.I.), Dr Ahmed Ramadan

(14)Project name: Preparation and characterization of complexes-------
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**
Authors: Gamil Abdullah Ahmed Al-Hazmi (P.I.)

(15)Project name: Estimation of heavy metals and assess the seriousness of the fish for human consumption in Abha (source Jizan - Red Sea)
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**)
Authors: **Tarek O Said (P.I.),** Ahmed A. Omran, Abubakr M. Idris and Khalid Fahmy

(16)Project name: Facile spectrometric method for the determination of binding constant of cationic drugs with serum albumin
Supported by: King Abdulaziz City for Science and Technology (**KACST**); A-T-34-060
Authors: Ahmed A. Omran and Eman M. Al-Shihri

(17)Project name: Determining the levels of Polycyclic aromatic hydrocarbon (PAH) pollutants in Abha soils and their sources
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**) **;** KKU-SCI-11-003
Authors: Ahmed A. Omran, Mohamed D. Oteef and Tarek O. Saied

(18)Project name: Pyrazole carboxamides as novel anti inflammatory and analgesic agents: Synthesis, characterization and molecular modelling
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**) **;** KKUSCI035
Authors: Abduah Al Sehemi, Yousry A. Ammar, Samir Bondock.

(19)Project name: Novel synthesis of thiazolylpyridine derivatives: Search for potent antimicrobial agents
Supported by: Deanship of Scientific Research, King Khalid University (**KKU**) **;** KKU-SCII-092
Authors: Tamr Nasr, Samir Bondock, Yousry A. Ammar.

(20)Project name: Novel Synthesis of Starch/Cellulose Composites from Agro-Industrial Wastes and Their Industrial Applications.
Supported by: King Abdel Aziz City for Science and Technology. **2014**-2016.
Authors: **Keshk, S.M.A.S. (P.I.)**

Scientifice Awards for Chemistry Department

(A)- His excellency **Prince Dr. Turki Saud Mohammad Al Saud presented** Scientific Award from KACST (SHIELD) to **Prof. Dr. Abdullah G. Al-Sehemi** for Scientific Distinction result of the project title: Dye-sensitized nanocrystalline TiO_2 solar cell-towardhigh sun light to electricity conversion (08-nan155-7), **2014**

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(B) Dr. Ahmed Fazary, King Khalid University Distinguished Researcher Award for a year 2013

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