ANNUAL REPORT
2022-2023

Mineral Water

A product of INARS

Institute of National Analytical Research and Service (INARS)
Bangladesh Council of Scientific & Industrial Research (BCSIR)

Dr. Qudarat -i-khuda Road, Dhanmondi
Dhaka-1205, Bangladesh

+88 02 223364959
+ 88 02 58611767

dir-inars@bcsir.gov.bd

http://inars.bcsir.gov.bd
www.bcsir.gov.bd

MUJIB 100

Citizen Charter of INARS

- The process established by the scientists are offered to the entrepreneurs as leased out process for production.

- Detection and quantification of different elements and contaminants of water, food, feed and other samples by NMR, IC, UV, Elemental Analyzer, HPLC, GC, GC-MS, LC MS, AAS, FTIR and other different analytical services based on ISO/IEC17025:2017 standard.

- The scientists of these laboratories visit different factories and industries each year to sketch out their problems and try their best to mitigate the problems.

- Different products and goods imported from abroad are analyzed. As a result, appropriate measurement about the quality of the product can be ascertained which helps government getting revenue.

- Different goods and products supplied by different private agencies and entrepreneurs are analyzed in these laboratories which help the4m to produce quality goods and products.

- Different goods and products supplied by different private agencies and entrepreneurs are analyzed in these laboratories which help them to produce quality goods and products.

- Arrangement of science fair each and every year as part of implementation of BCSIR Act-2013.Flourish the intelligence of young scientists of school and college level.

- The research attainments are published in the reputed national and international journals that are necessary for the students engaged in higher education and scientists as well.

- The skilled scientists of diverse disciplines co-supervise the research works of the MPhil and PhD students of the universities as co-supervisor.

ANNUAL REPORT
2022-2023

Institute of National Analytical Research and Service (INARS)
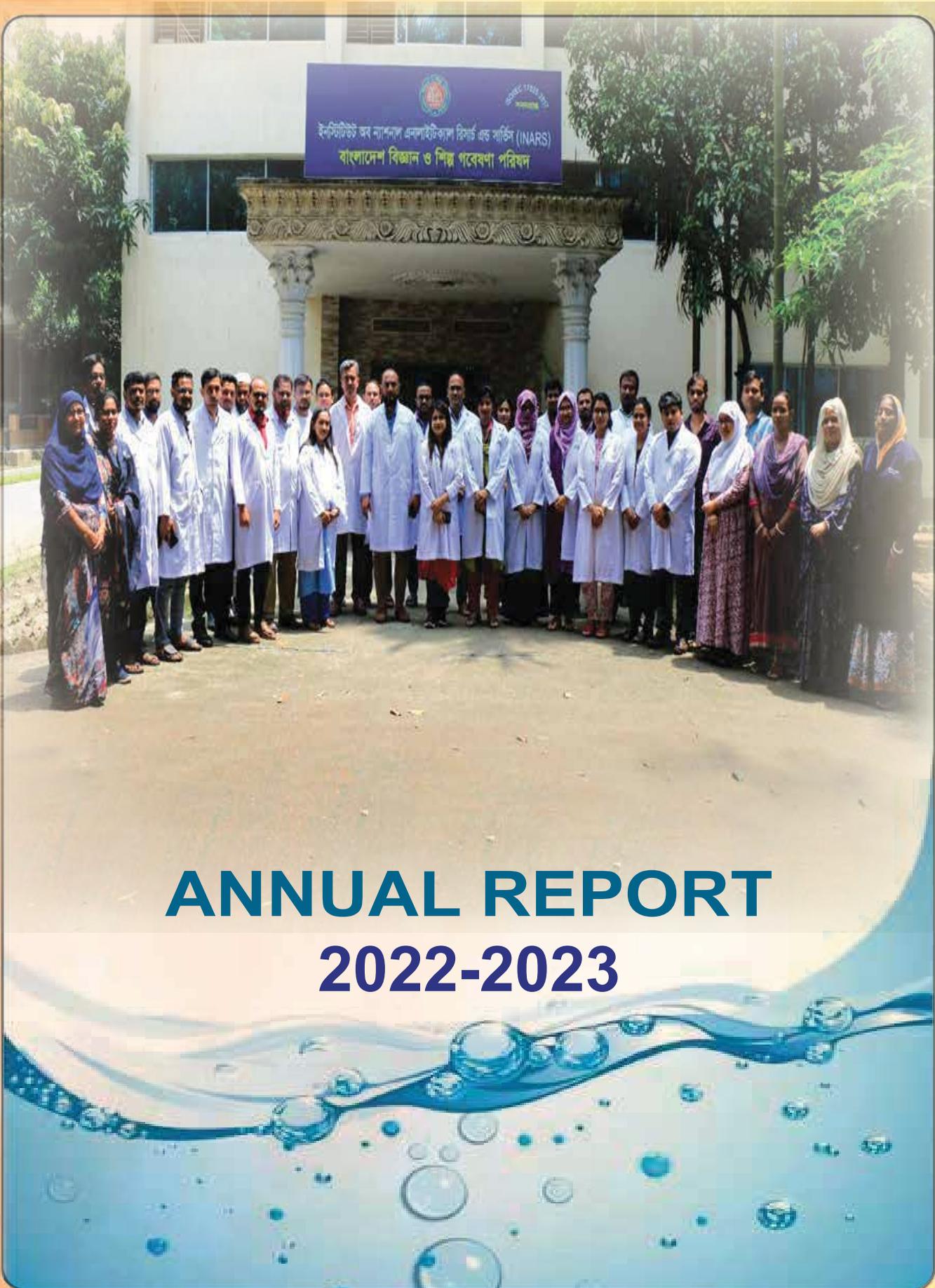(ISO 17025:2017 accredited)
Bangladesh Council of Scientific and Industrial Research (BCSIR)
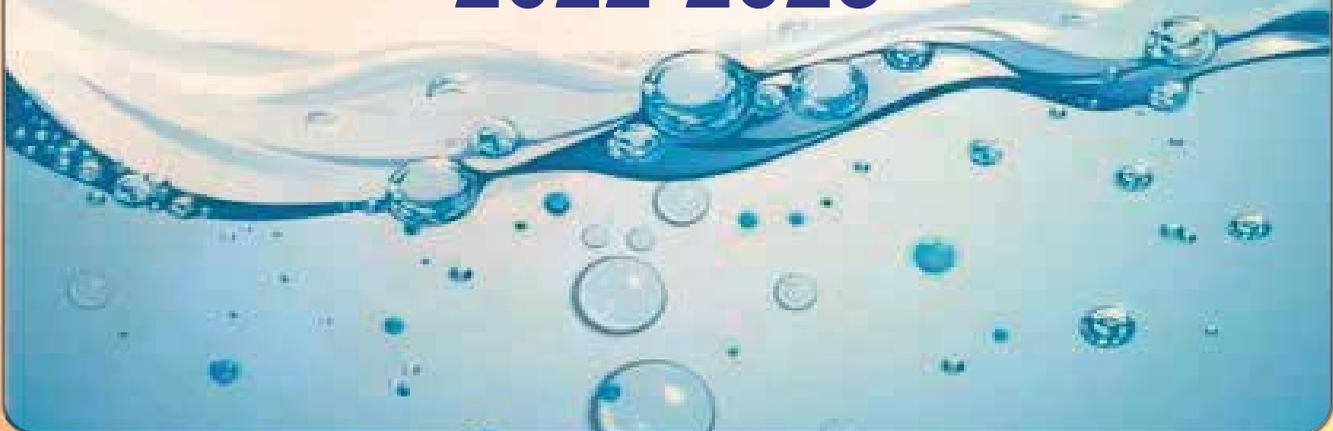Dr. Qudrat-I-Khuda Road, Dhanmondi, Dhaka-1205, Bangladesh.
Phone: 02-9664959
www.bcsir.gov.bd
www.inars.bcsir.gov.bd

ANNUAL REPORT
2022-2023

Message from Chairman, BCSIR

I am delighted to know that the Institute of National Analytical Research and Service (INARS) is going to publish its 7th Annual Progress Report (APR) for the fiscal year of 2022-2023. As the chairman of the Bangladesh Council of Scientific and Industrial Research (BCSIR), it is a great honor and a source of inspiration for me to write something for this annual report. In this report, the scientists and researchers' year-long efforts with their research and development activities are briefly highlighted.

The Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, put the highest importance on the science and technology sector while rebuilding a war-torn country. Our visionary leader, Hon'ble Prime Minister Sheikh Hasina, the able daughter of Bangabandhu Sheikh Mujibur Rahman, has been working relentlessly and providing unwavering support to realise the dream of Sonar Bangla and build Smart Bangladesh.

Under the immaculate guidance and stewardship of honorable minister, the ministry of science and technology, architect Yeafesh Osman, BCSIR is aspiring to be the center of excellence for market driven scientific, industrial and technological research and innovation. I want to convey my sincere gratitude to the honorable minister, for his ongoing assistance in keeping BCSIR running successfully.

I am very pleased to know that, from the very inception, this institute has been responsible for ensuring safe water quality in Bangladesh. INARS is committed to achieving the Sustainable Development Goal (SDG-06) of ensuring safe water for all in Bangladesh. On that ground, this institute does arsenic mitigation, water purification, rainwater harvesting, environmental technology verification, identifies active ingredients in medicinal plants, and carries out microbiological analyses of water. In this Institute, scientists also pursue research on renewable and green technologies, analytical, environmental and natural product chemistry. In addition, scientists render their knowledge and share experience to private entrepreneurs and industrialists to handle their challenges for the smooth industrialization and sustainable development in our country.

It is worth mentioning that INARS serves as the first ISO 17025:2005-accredited government testing laboratory in Bangladesh. It has achieved ISO 17025:2017 accreditation on eighty-eight water quality parameters to date from the Bangladesh Accreditation Board (BAB).

This report will give you a vivid picture of the year-long activities of the institute on R&D projects, publications, human resource development, capacity building and analytical services. I strongly believe that this important publication will be a great use for scientists, researchers, and other relevant stakeholders, including our development partners. I genuinely urge everyone at INARS to continue your spirited efforts on advancing research, offering services, and developing cutting-edge technologies for the welfare of human beings. I would also like to express my heartfelt gratitude and felicitations to the director, members of the editorial committee, scientists, and staff of INARS for their sincere efforts and significant contributions to the nation through relevant areas of research and services.

Professor Dr. Md. Aftab Ali Shaikh
Chairman
BCSIR

Message from Director INARS

As a new Director of INARS, it is a great honor for me to announce that INARS will release its 7th annual report 2022-2023 for the respective fiscal year. This report provides a documentary on the general development of the R&D activities in addition to other significant events, such as participation in conferences, training, seminars, testing services provided by the institute, etc.

Since its establishment from 2016, INARS has been conducting research as part of an annual development project with the goal of advancing technology and achieving industrial development self-sufficiency. In addition to R & D activities, INARS provides its analytical services to different government organization, different industries, NGOs, public and private universities. INARS is dedicated to provide high-quality research and services and is equipped with some cutting-edge machinery. The performance claims of arsenic removal technologies are being verified by this institute, which is crucial for Bangladesh's arsenic mitigation efforts. In this regard, INARS has successfully attained ISO 17025:2017 accreditation as the first government testing laboratory in Bangladesh and has continued to provide high-quality research and services by achieving accreditation on 88 water quality parameters.

I acknowledge and am extremely grateful to our honorable Chairman, Professor Dr. Md. Aftab Ali Shaikh, for his unwavering support and constructive suggestions in bringing out this annual report. Finally, I express my special thanks to all the members of the editorial committee for their tireless effort for publication of the annual report.

Sincere thanks are due to all the scientists, technicians, officers, and staff of these laboratories for their support in the preparation of the report.

Sarker Kamruzzaman
Director (Addl.Charge), INARS, BCSIR

Message from former Director INARS

My announcement that INARS will release its 7th annual report for the relevant fiscal year, 2022-2023, is a great honor. In addition to other pertinent events like participation in conferences, training, seminars, testing services provided by the institute, etc., this report gives a documentary relating to the overall progress of the Research and Development (R &D) activities.

INARS is the first government laboratory in Bangladesh and only one in BCSIR that achieved ISO/IEC 17025:2005 accreditation from Bangladesh Accreditation Board on eighty eight (88) water quality parameters. This institute plays a vital role in arsenic mitigation in Bangladesh. INARS is equipped with some state of the arts instrument for enhancing the research and development as well as increasing the capacity of analytical services. In addition, we are committed to ensure quality testing service to our stakeholders using sophisticated equipment.

I appreciate and sincerely thank our honorable Chairman, Professor Dr. Md. Aftab Ali Shaikh, for his ongoing encouragement and helpful ideas for the publication of this annual report. My sincere gratitude goes out to each and every member of the editorial committee for their diligent efforts in ensuring the publication of the annual report. Sincere appreciation is given to all of the scientists, technicians, officers, and employees of these laboratories for their assistance with the report's creation.

Shamim Ahmed
Former Director (In-Charge), INARS, Dhaka

Message from Convener

As a convener of the 7th Annual Progress Report (2022-2023) publication committee, I offer my immense pleasure to present the annual report of INARS before you along with the overall research and development activities, achievements, analytical services, participation and offering trainings, seminars, conferences and workshops. I hope it would be very useful for the researchers, industrialist, entrepreneurs, students and other respective people.

INARS is always committed to serve the nation by doing quality research and services. This institute is renowned for its role in ensuring safe drinking water and sustainable ecosystem by maintaining quality control and quality assurance protocol for the betterment of test results as an ISO/IES 17025:2017 certified laboratory. Keeping the spirit ahead, the team of INARS is working tirelessly to achieve the mission and vision targeted by this institute.

I express my sincere gratitude to the chairman of BCSIR for his continuous support and inspiration to prepare this annual report. I am also grateful to the Director, INARS for his guidance and support for completion this report. My team member along with the scientists, technologists, officers and staffs of INARS deserve thumbs up for their cooperation to prepare this report.

Dr. Muhammad Abdullah Al-Mansur
PSO & Convener
Annual Publication Committee
INARS, BCSIR, Dhaka

Message from Member Secretary

An Annual Progress Report (APR) publishes the noteworthy attainments and overall activities of an institute for the respective monetary year. Each year Institute of National Analytical Research and Services (INARS) upholds this custom by reporting the all in all evolvement in research and activities of this organization. This year, it has been a great privilege for me to work as the member secretary of the 7th Annual Progress Report (2022-2023) publication committee of INARS. Beginning with a brief history of the institute, this report provides the details of manpower, available instruments, research and development projects and analytical services of INARS. Along with that, this book highlights the publication works, participated trainings/conferences and other routine activities in sections.

INARS is equipped with some cutting edge instrumental facilities to deliver quality research and services. Scientists of this institute are dedicated to do research for the development of technology in industrial sector. This institute is well recognized for maintaining ISO standard laboratory activities for research and analytical services. In this perspective, we feel gratified to state that INARS has already received ISO/IEC 17025:2017 accreditation from Bangladesh Accreditation Board on eighty eight (88) water quality parameters.

I would like to acknowledge our honorable Director of INARS, BCSIR who always supported us to conduct all activities related to research and service in this institute. I am also obliged to the convener of the publication committee for his time to time reconnaissance and to the passionate publication team members who positioned their efforts to prepare this report.

Sharmin Ahmed

Sharmin Ahmed Trisha
SO & Member Secretary
Annual Publication Committee
INARS, BCSIR, Dhaka

Publication Committee

Dr. Muhammad Abdullah Al-Mansur

PSO, INARS, BCSIR, Dhaka
Convener

Sharmin Ahmed Trisha

SO, INARS, BCSIR, Dhaka
Member Secretary

AHM Shofiul Islam Molla Jamal

SSO, INARS, BCSIR, Dhaka
Member

Rashed Mahmud

RC, INARS, BCSIR, Dhaka
Member

Dr. Sabina Yasmin

SSO, INARS, BCSIR, Dhaka
Member

Background of INARS

Institute of National Analytical Research and Service (INARS), the ISO certified laboratory of BCSIR was established in September 2016. Since then INARS has been conducting research focusing mostly on analytical, environmental and natural products chemistry. This institute has expertise in research related to water chemistry, more specifically alleviating arsenic and other heavy metals contamination from water. Moreover, the existing research trend has been extended to investigate the organic contaminants in water.

INARS has contributed significantly with arsenic elimination technology verification process since last decade and subsequently the institute has come up with the solution to ensure arsenic free drinking water for everyone in Bangladesh. More recently, a microbiology wing has been installed here to determine microbial quality of both potable and non-potable water.

With a broader view ahead, INARS is mostly obligated to conduct research maintaining a standard laboratory set up. Besides, INARS has profoundly achieved ISO 17025:2017 accreditation as a first ever govt. testing laboratory in Bangladesh. Initially, it received accreditation for thirty four (34) water quality parameters first. Then in 2019, INARS successfully achieved accreditation for forty (40) water quality parameters more (total 74) which has been expanded to eighty eight (88) parameters in 2020. The institute is always committed to provide testing services following international standard.

ড: কুদরাত-ই-খুদার কাছ থেকে শিক্ষা কমিশনের রিপোর্ট প্রহণ করছেন

Dr. Muhammad Qudrat-E-Khuda

Our Mission

To carry out, promote and guide scientific, industrial and technological research maintaining ISO/IEC 17025:2017 standardization that optimizes the economic, environment and social benefits for the people of Bangladesh.
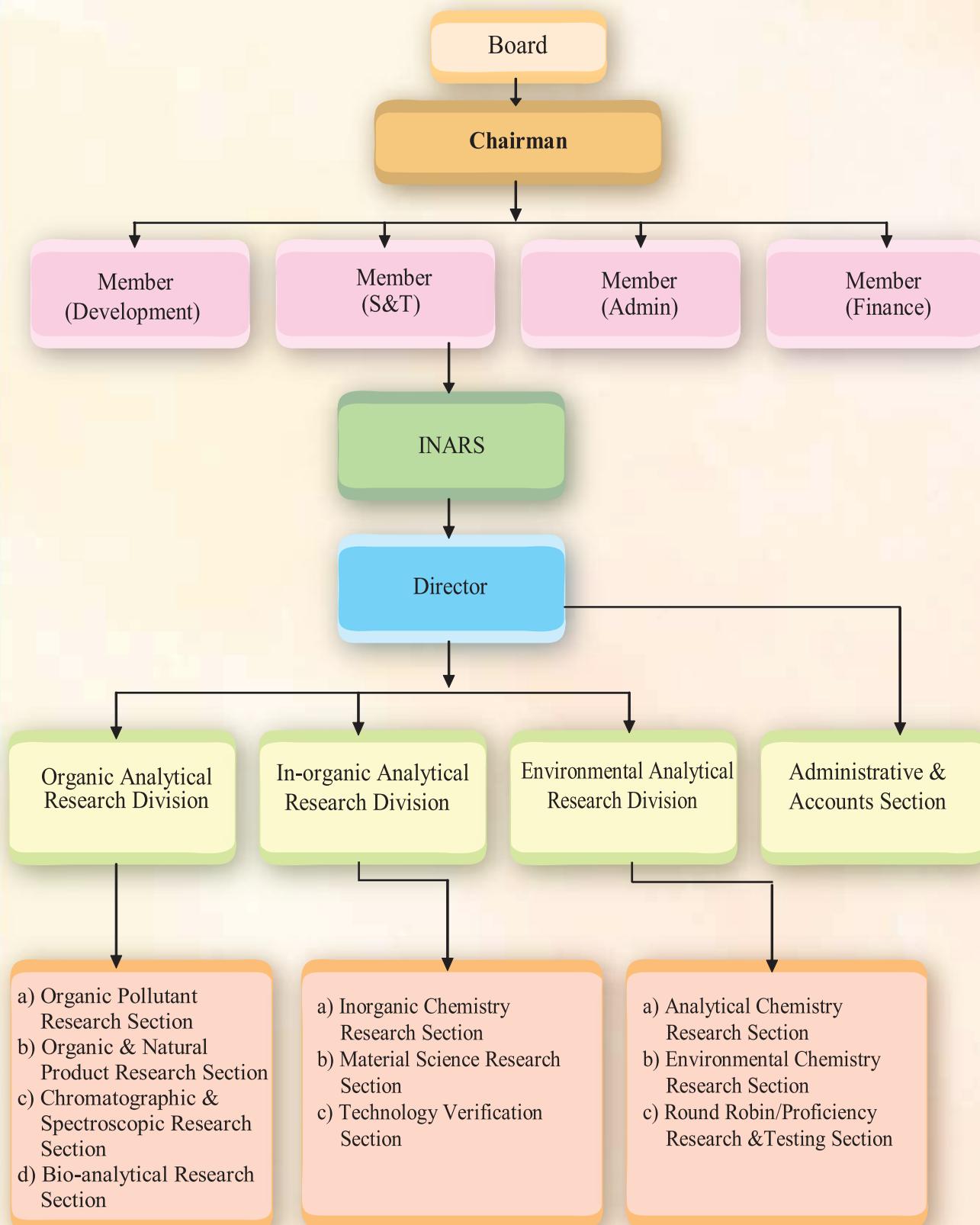
Our Vision

To achieve the leading position on conducting analytical research and services focusing on safe water

Table of Contents

Organizational structure

```
                          Board
                            │
                            ▼
                        Chairman
                            │
    ┌───────────────┬───────┴───────┬───────────────┐
    ▼               ▼               ▼               ▼
 Member          Member          Member          Member
(Development)    (S&T)           (Admin)         (Finance)
                    │
                    ▼
                  INARS
                    │
                    ▼
                 Director ──────────────────────────────┐
                    │                                    │
 ┌──────────────┬───┴───────────┬────────────────┐      │
 ▼              ▼               ▼                 ▼      ▼
```

Organic Analytical Research Division	In-organic Analytical Research Division	Environmental Analytical Research Division	Administrative & Accounts Section

| a) Organic Pollutant Research Section
b) Organic & Natural Product Research Section
c) Chromatographic & Spectroscopic Research Section
d) Bio-analytical Research Section | a) Inorganic Chemistry Research Section
b) Material Science Research Section
c) Technology Verification Section | a) Analytical Chemistry Research Section
b) Environmental Chemistry Research Section
c) Round Robin/Proficiency Research &Testing Section |

Activities conducted in INARS

- Analysis of arsenic contamination in groundwater of Bangladesh

- Arsenic removal technology verification and technology development

- Chemical and biotechnological innovation for wastewater treatment

- Technology development for industrial effluent treatment

- Analyzing the level of heavy metal, toxic metal, microbial contaminants, preservatives etc in water, drink, food & feed stuffs, drugs

- Analyzing the presence of pathogenic microbes in potable and non-potable water

- Chemical and biological study of natural products and their application on different field

- Conducting research and development (R & D) in analytical chemistry, environmental sciences, natural products chemistry and laboratory quality management system (LQMS)

- Method development and validation to analyze pesticides residue in different vegetables

- Method development and validation to analyze antibiotic residue in poultry samples

- Adsorptive removal of antibiotic residue from waste water using Graphene-based nanoadsorbent

- Helping government and nongovernmental organizations in establishing quality of industrial products, consumer goods, environmental quality parameters, goods, raw materials as per international standard

- Development and validation of different analytical methods

- Maintenance and expansion of ISO/IEC 17025:2017 accreditation

- Participating in Proficiency Test (PT) for particular parameters and organize inter laboratory comparison (round-robin) services with an aim of obtaining accreditation as a PT provider

- Provides training on the installed instruments as well as regarding the laboratory quality management and ISO maintenance

Research Divisions at INARS

Organic Analytical Research Division	Inorganic Analytical Research Division	Environment Analytical Research Division
Name and Designation	Name and Designation	Name and Designation
Dr. Muhammad Abdullah Al Mansur, PSO (Division in-charge)	Dr. Md. Ahedul Akbor, SSO (Division in-charge)	Dr. Md. Humayun Kabir, SSO (Division in-charge)
AHM Shofiul Islam Molla Jamal, SSO	Md. Abu Bakar Siddque, SSO	Shamim Ahmed, PSO
Shahnaz Sultana, SO	Rokaia Sultana, SO	Dr. Sabina Yasmin, SSO
Sharmin Ahmed Trisha, SO	Aynun Nahar, SO	Tajnin Jahan, SO
Rashed Mahmud,RC	Mehedi Hasan, SO	
Md. Nurul Islam, Jr. Tech.	Md. Khandakar Parvej Ahmed, Technician	
Md. Jahangir Alam, Jr. Technician	Md. Sipar Miah, Lab. Attn.	Shah Jalal Sharkar, Jr. Technician
Ahammad Ali Islam, Lab. Tech	Md. Hanif Miah, Lab Atten	Md. Moin Uddin, Lab Atten

Administrative Section	Accounts Section
Name and Designation	Name and Designation
Sheikh Md. Wazed Ali, Account Officer (Addl. Chrge)	Sheikh Md. Wazed Ali, Account Officer (Addl. Chrge)
Md. Woaz Kazi, LDA	Rokhsana Akter, UDA
Shamima Akter, LDA	Nasima Begum, Junior Technician
Md. Amir Hossen, MLSS	
Dithi Rani Dhoom, Cleaner	

Budget Allocation and Expenditure of INARS

Fiscal Year (2022-2023)	Allocation (Tk)	Expenditure (Tk)
Salary of Scientist/Officer/Staff	1,91,05,000/-	1,75,06,011/-
Goods and Service	65,74,500/-	64,91,944/
R&D and other Grants	47,20,000/-	47,15,645/-
Capital	10,61,000/-	10,54,220/-
Total	3,14,60,500/-	2,97,67,820/-

Structure of Stake holder (INARS)

INARS has been providing testing services alongside its research activities to solve analytical problems of different industries. Customers are mostly from Bangladeshi industries, different government departments / organizations / institutions, donor governments and NGOs. The followings comprise major stake holder structure of INARS:

Research Organizations (BARI, BAEC, ICDDRB etc)

International Organizations (UNDP, UNHCR, UNEP etc)

Chemical and Agro-chemical Industries (3A Agro, AGATA Feed Mills Ltd., ASM Chemicals Industries Ltd., Bashundhara Chemical Industries Ltd., Samuda Chemical Complex Ltd.)

Government Organizations (BSTI, FIQC, WASA, Dhaka Metro-rail Project, BARAPUKURIA COAL MINING COMPANY LIMITED)

Agro, Fisheries, Food and Beverage Company (Dimas Agro Food and Beverage, Europa Beverage and Food Ltd., FM Agro Foods Ltd., Globe Fisheries Ltd.)

Pharmaceuticals and Hospitals (Bangladesh Specialized Hospitals, Sanofi Bangladesh Ltd., Popular Medical Collage Hospital, Popular Diagnostic Centre Ltd.)

Consulting Organizations (ENRAC, EQMS, BETS, ABDUL MOMEN Group, etc)

Water Supply and Purification Industries (Infinite Water Australia, J.M. Water, Monir Water Supply, Multipure Water Solution,Total Water Solution Ltd)

Analytical & Environmental Monitoring Organizations (SURVEY BANGLADESH, SGS, BUREAU VERITAS)

Gas, Energy and Power Company (Desh Energy Chandpur Power Company Ltd., Gas Min Ltd., Gas Transmission Company, Green Power Technologies)

Universities (Public & Private University Example- DU, JU, RU, CU etc)

Business Group (Jabed Group, Momen Group, Kazi Farms Group, Anower Group, Jamuna Group)

Company related to Engineering and Technologies (HKM Engineering & Technology, Ground Instrumentation and Engineering Ltd., Peal Technologies Ltd.)

Analytical & Environmental Monitoring Organizations (SURVEY BANGLADESH, SGS, BUREAU VERITAS)

BCSIR (Scientists & Research Fellow)

ANNUAL REPORT
2022-2023

On Going
Research & Development projects

Adsorptive removal of antibiotics residue from waste water using graphite electrodes of used dry cell battery

Project Advisor: Professor Dr. Md. Aftab Ali Sheikh

Dr. Sabina Yasmin, SSO, (PL); Dr. Md. Humayun Kabir (SSO), Shamim Ahmed (PSO), Dr. Muhammad Abdullah Al-Mansur (PSO), Tajnin jahan (SO), Dr. Md. Selim Khan
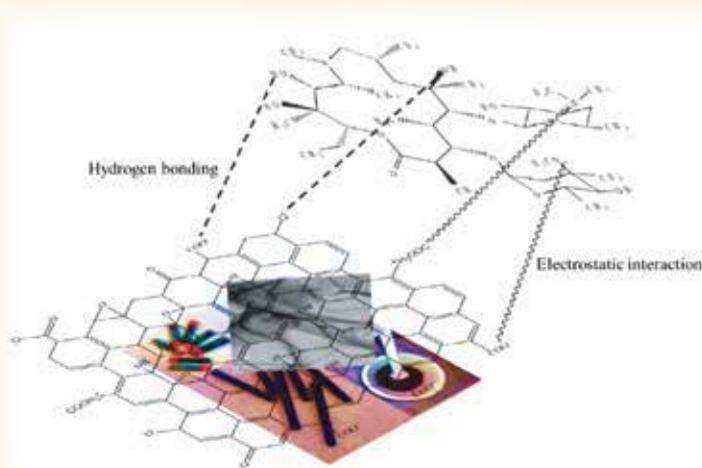
Introduction

The growth of the human population has increased the demand for the supply of freshwater. However, water pollution due to the disposal of waste chemicals from industry, agriculture, and medical treatments has become a major issue in recent decades. The disposal of antibiotics to the environment is also a huge problem with the development and usage of antibiotics in medical treatments. The fast spread of antibiotic-resistant bacteria has a potential risk to the public health worldwide. To resolve these problems, it is urgent to design a cost-effective, efficient, and regenerable adsorbent with proper functional groups which are favorable for targeted adsorption by different types of interactions.

Dry cell batteries, are low cost and high in demand for various portable applications including, flash lights, remote controls, clocks, toys, watches, transistor radios and portable electronic devices etc. Dry cell battery contains a graphite rod as a positive electrode in the middle portion of the battery. Thousands of tons of zinc-carbon batteries are used every year around the world and are often not recycled. These disposed dry cell batteries disintegrate with time and the chemicals and metals inside the batteries leach to the environment. Their toxicity, abundance and permanence in the environment results in severe impact on nature and poses grievous health consequences.

So, the graphite rod in these batteries can be recycled for synthesizing high quality graphene oxide which is the most demandable materials for nanotechnology. This work is aimed at synthesis of high-quality Graphene oxide (GO) from used graphite recovered from spent dry cell batteries which can be used as an adsorbent for antibiotic residue adsorption from waste water.

Research Objectives

The aim of this study is to development of graphene based adsorbents using waste dry cell battery to remove antibiotics residue from waste water

Progress/ Outcome

1. According to project schedule we have collected Waste dry cell batteries from marketplaces and households.
2. Synthesis of graphene oxide (GO) from graphite rod of waste dry cell battery using improved Hummers method.
3. The prepared GO has been characterized with Scanning electron microscopy (SEM), Fourier transform infrared (FTIR) spectroscopy, XRD, and Elemental analyzer.
4. Batch experiments has been performed to investigate the adsorption process using Azithromycin antibiotic as adsorbates.
5. A manuscript has been Accepted in international journal (ACS Omega)

Graphene based Nanocomposites for the Electrochemical Sensing of Trace Level Arsenic in aquous media

Dr. Sabina Yasmin, SSO, (PL); Dr. Md. Humayun Kabir (SSO), Shamim Ahmed (PSO), Tajnin jahan (SO), Md. Ismail Hossain, Md. Saidul Islam (SSO)

Introduction

Arsenic ion (As^{3+}), a highly toxic substance, widely distributed in nature and one of the most abundant mineral in the earth's crust.12 According to the World Health Organization (WHO), the maximum acceptable level of As^{3+} in drinking water is 10 ppb and around 20 countries aresuffering from serious As^{3+} contamination.The determination of trace level (sub ppb) of As^{3+} in natural water (ocean, sea, rivers), wastewater (from mining, metal processing, pesticides, organic chemicals, etc.) and drinking water has become very important because these media are vulnerable to As^{3+} contamination. Among many developed methods for toxic metal ions detection, electrochemical (EC) techniques especially, low-cost voltammetry has gained considerable interest in terms of sensitivity, portability, rapid analysis time and suitable for

So, the graphite rod in these batteries can be recycled for synthesizing high quality graphene oxide which is the most demandable materials for nanotechnology. This work is aimed at synthesis of high-quality Graphene oxide (GO) from used graphite recovered from spent dry cell batteries which can be used as an adsorbent for antibiotic residue adsorption from waste water.

on-site detection. The performance of such methods, however, depends heavily on the materials used for detection purposes
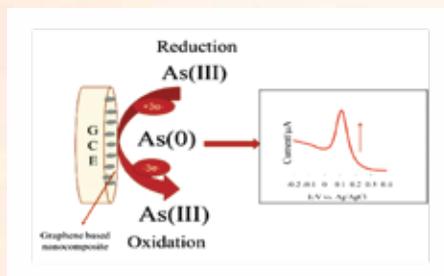
Research Objectives

i. Synthesis of graphene based electro catalyst for the detection of As

ii. To develop a cost-effective, field portable and highly selective sensors to detect trace level arsenic in water

Progress/ Outcome

1. According to project schedule we have Synthesized Graphene oxide from waste dry cell using improved Hummers method.

2. The prepared GO has been characterized with Scanning electron microscopy (SEM), transmission electron microscopy (TEM), Fourier transform infrared (FTIR) spectroscopy, XRD, and Elemental analyzer.

3. Electrochemical experiment has been conducted.

4. Draft writing.

Development of an Easy and Cheap Method for Analyzing Antibiotics Residue in Milk

Dr. Md Humayun Kabir, SSO, (PL), Dr. Sabina Yasmin, Shamim Ahmed, Dr. Muhammad Abdullah-Al-Monsur, Shakila Akter, A. H. M. Shofiul Islam Molla Jamal

Introduction

Milk is an important part in human diet. Farmers using antibiotics to grow healthy milking cow. These antibiotics remain as residue in milk. It is important to monitor the antibiotics level in milk. Without monitoring these residues limit people taking antibiotics residue and become antibiotics resistance. To proper utilization of antibiotics in milking cow and save the people from antibiotics residue, this is very important to monitor antibiotics residue in market milk sample. It is also very important to develop an easy and cheap method to monitor antibiotics residue. No method reported till date which can measure residue in easy cheap and authentic way.

Research Objectives

The aim of this study is to develop an easy and cheap method to analyze antibiotics residue in milk which could be used to

i. Monitor antibiotics residue in marketed milk

ii. Monitor antibiotics residue in milk products

Progress/ Outcome

1. One Method has been developed for the determination of Azithromycin antibiotic in milk.

2. Method developments study is going on, Tylocin, Tetracycline oxytetracycline, Metronidazole, Ciprofloxacin.

3. One paper has been submitted in Peer reviewed Journal

Adsorption of Bisphenol From Waste Water By Carbon Nanomaterials

Project Advisor: Professor Dr. Md. Aftab Ali Sheikh

Dr. Md. Humayun Kabir (PL), Shamim Ahmed ,Shamim Ahmed (SSO), Dr. Muhammad Abdullah Al-Mansur, Md. Mahbubur Rahman (SSO), BCSIR laboratories, Dhaka, Dr. Md. Moniruzzaman (PSO), BCSIR laboratories, Dhaka

Introduction

Endocrine-disrupting chemicals (EDCs) can cause abnormalities in the functions of endocrine systems of wildlife and humans.2 Therefore, EDCs have attracted increasing scientific and social attention in recent years. one of these EDCs, is widely used as an intermediate in), the production of polycarbonates, epoxy resins, and other plastics. It is considered to be one kind of carcinogens and critical pollutants because it is harmful to organisms.3,4 Although BPA is degradable under natural aerobic condition, it has been reportedly detected in wastewater, surface water, groundwater, and even drinking water.5,6 Accordingly, BPA is extensively studied as the model compound for the removal from water among the phenolic EDCs.

It is important to develop advanced methods to remove BPA from aqueous solutions. Adsorption method is a superior and rapid removal method as it is low cost, easy to operate, and no secondary pollutants.Regarding the adsorption technique, an effective adsorbent is crucial to guaranteeing theefficiency of water treatment. Graphite oxide (GO), an oxygen-rich derivative of graphite, has been extensively investigated in recent years. It exhibits an extended layered structure with plenty of hydrophilic oxygencontaining groups (—OH,—COOH,—CHO, and epoxy groups) on the graphitic backbone. Additionally, GO can be obtained from cheap natural graphite in large quantities, and shows excellent adsorption capacity for the removal of heavy metal ions, dyes, and antibiotics, from aqueous solutions.

In this paper, the removal behavior of BPA from water by GO as a function of solution characteristics, including BPA concentration, pH, ionic strength, and temperature, was investigated systematically. The adsorption capacity was evaluated and adsorption mechanism of BPA by GO was proposed

Research Objectives:

The aim of this study is to development of carbon nanomateral based nano?adsorbents to remove Bisphenol (BPA) from waste water

Progress/ Outcome

1. According to project schedule we have developed our method to measure the BPA in water.

2. Synthesis of graphene oxide (GO) by improved Hummers method.

3. Synthesis of graphene based adsorbent using simple chemical reduction method

4. The prepared graphene based adsorbent has been characterized with Scanning electron microscopy (SEM), Fourier transform infrared (FTIR) spectroscopy, and Elemental analyzer.

5. Batch experiments has been performed to investigate the adsorption process of BPA on graphene based adsorbent.

6. One manuscript has been submitted

Removal of drugs residue from aqueous solution using zeolite functionalized graphene oxide

Dr. Md. Humayun Kabir (PL), Dr. Sabina Yasmin (SSO), Shamim Ahmed (PSO), Tajnin Jahan, (SO), Md. Ismail Hossain (RC), Sabrina Mostafa Annie (SSO), Dr. Dipa Islam, (PSO)

Introduction

Water is so crucial to human beings as well as animals and plants that their lives are impossible without it. But recently, it is becoming a hazard to human health as well as to the life of flora and fauna. In 2010, 80 % of the world's total population was exposed to high threats of water pollution. One of the sources responsible for water pollution is the pharmaceuticals. The pharmaceuticals are added to the freshwater mainly through hospital wastes, pharmaceutical industries and therapeutic drugs. The existence of the pharmaceuticals in drinking water is a potential threat for life, since little is known about the ill effects of these long-term existing compounds on human health. Their detection and effective removal or lessening their effects on the environment is thus becoming an international issue for the environmental scientists. Recently graphene oxide and graphene based composites ae used as adsorbent to remove pharmaceuticals from waer. To emove pharmaceuticals from water graphene can be efficiently used as adsorbent if it can functionalized with more functional group containing materials.

Research Objectives:

The aim of this study is---

i. To synthesize a graphene- zeolite composite

ii. Using the graphene- zeolite composite as an efficient adsorbent for removal of pharmaceuticals from water.

iii. Optimize the best adsorptive removal conditions

Progress/ Outcome

1. According to project schedule, we have Synthesized Graphene-Zeolyte composite

2. Characterization of GO-zeolite composite has been completed

3. Bach experiments has been conducted to Optimize the removal efficiency pharmaceuticals using GO-zeolite composite

4. Draft writing

Removal of haloforms from treated water by adsorption onto carbon aerogel and waste tea leaf

Md. Ahedul Akbor, PSO (PL), Md. Abu Bakar Siddique, SSO, Aynun Nahar, SO, Mehedi Hasan, SO

Introduction

Chlorine-treated drinking water generates disinfectant by-products (DBPs) due to the reaction between natural organic complexes, halides in water, and disinfectants. Among different disinfectants like Trihalomethanes (THMs), haloacetic acids (HAAs), haloacetaldehydes (HALs), etc. THMs consider the most hazardous DBPs. Dichlorobromomethane (DCBMs),

dibromochloromethane (DBCM), and tribromomethane (TBM) are all THMs. Long-term exposure of these hazardous DBPs may cause an increase in the risk of bladder cancer, colorectal cancer, poor pregnancy outcome, spontaneous abortions, stillbirth defect, etc. In order to reduce health risks, the removal of DBPs precursors before disinfection is considered to be the most effective method. The effective removal of DBPs can be achieved by several treatment processes such as adsorption, anion exchange, biological treatment, enhanced coagulation, membrane techniques, and advanced oxidation processes (AOPs). Among them, adsorption is considered the most promising technology that can efficiently remove organic compounds from groundwater, drinking water, and wastewater. Various waste materials, including kapfibre, bamboo pulp, tree leaves, and landfill refuse, have been used to produce carbon aerogels over the past decade. This study represents a valuable method for transforming waste paddy straw into aerogels of carbon with excellent quality, stability, and high adsorption capacity of halo methane pollutants in water Moreover, waste tea leaves are a potential bio-sorbent for removing organic pollutants due to intricate porosity and higher specific surface area. In this study, waste tea -leaves were utilized as bio-adsorbent for the removal of DBPs from drinking and surface water.

Research Objectives:

1. To develop an effective DBPs removal technique from drinking and wastewater.

Progress : Adsorbent has been prepared.

Preparation of carbon aerogel from waste paper for the removal of organic pollutants from wastewater

Aynun Nahar,SO (PL), Shamim Ahmed, PSO, Dr. Md. Ahedul Akbor, PSO, Md. Abu Bakar Siddique, SSO, Mehedi Hasan, SO

Introduction

Organic solvents, a variety of carbon-based pollutants, have been employed for a vast array of purposes despite their inherent dangers. Exposing these pollutants regularly may harm the central nervous system's function (CNS) and other body parts. The level of impact, signs, and symptoms will depend on concentration, time, duration, frequency, and nature of solvents, leading to common effects like headache, dizziness, tiredness, blurred vision, behavioural changes, unconsciousness, and even death. Many methods and techniques have been thoroughly studied to remove organic solvents from wastewater, including advanced oxidation, adsorption, extraction, chemical precipitation, membrane separation, and photocatalysis. Among them, adsorption is considered the most promising technology that can efficiently remove organic compounds from groundwater, drinking water, and wastewater. However, activated carbon has many micropores that cannot be reached by organic molecules and are only usable in powder form, which leads to a reduced capacity to adsorb and re-use.

Due to their remarkable properties such as open-pore structure, large specific surface area and high thermal and mechanical stability, carbon aerogels have gained tremendous interest in many science and technology fields. Various waste materials, such as kap fibre, bamboo pulp, tree leaves, and landfill refuse, have been used to produce carbon aerogels over the past decade. The abundant and inexpensive waste paper is a popular substrate for efficient and economical carbon aerogels among

these waste materials. In general, this study represents a valuable method for transforming waste paper into aerogels of carbon with excellent quality, stability, and high adsorption capacity of organic pollutants in water. As far as we know, in Bangladesh, this technique would be the first organic solvent removal technique that will be developed from waste paper.

Research Objectives:

1. To develop an effective organic pollutant removal technique from wastewater.

2. To develop a method for converting waste paper into adsorbent.

Progress: One manuscript has been submitted to a Q1 journal

Characterization of Chromium Tolerant Bacteria Isolated from Tannery Waste Water

Sharmin Ahmed, SO (PL), Subarna Shandhani Dey,SO,IFST, Shahariar Siddque, SO, IFST, Dr. Morshed Hasan Sarker,SSO,BCSIR Dhaka Lab,Md.Ahedul Akbar, SSO, Mehedi Hasan,SO, Shamim Ahmed, PSO

Introduction

Human activities and the discharge of industrial waste have resulted in the accumulation of metals like chromium in the environment which are eventually gathered through the food chain, leading to serious ecological and health problems. Among the two forms of chromium, hexavalent chromium is more deadly to living system. The biotransformation of Cr (VI) to Cr (III) thus offers as a substitute process for treating Cr (VI) contaminated wastes. Many facultative and strictly anaerobic bacteria commonly found in soils and marine sediments are capable of reducing Cr (VI) to Cr (III). Bioremediation of Cr (VI) appears to be universal since, Cr (VI) reducing consortia were isolated from Cr (VI) contaminated sites as well as uncontaminated sites. Microbial bio reduction of Cr (VI) to innocuous Cr (III), has gained increasing attention as a strategy for bioremediation of chromium contaminated sites as it provides green technology due to its in situ operation, selective removal and low cost. Exploring the world of microbes for searching suitable candidates of reducing Cr (VI) to Cr (III) have significant potential in development of in situ or on situ bioremediation strategies. So far studies revealed that Cr (VI) concentration could be lowered after microbial treatment under the controlled experimental conditions, but it is difficult to restore the environment during in situ operations. To implement its practical application at field scale, such studies need further attention because the potency of Cr (VI) resistance and reduction to Cr (III) depends on the interaction of bacteria with the environment, and the entire process is genetically regulated.

Objectives R&D Project:

a) To isolate microbes from tannery waste

b) To characterize microbes on the basis of their enzymatic activity, biochemical property and reduction potential of chromium

c) To identify microbes by gene sequencing

d) To assess the capability of microbes for bioremediation process

Progress: Isolation of 16 Chromium tolerant bacteria have been done.

Contamination levels of toxic elements in Gazipur industrial area of Bangladesh and their phytoremediation study

Mehedi Hasan, SO (PL),Md. Abu Bakar Siddique, SSO, Md. Ahedul Akbor, SSO,A. H. M. Shofiul Islam Molla Jamal, SSO,Tajnin Jahan, SO,Md. Ripaj Uddin, SO

Introduction:

With the rapid industrialization, the world getting polluted which affects the health of all organs of the environment such as air, soil, sediment, and water as well as both ecosystem and biodiversity due to the uncontrolled discharge of industrial pollutants (Bhuiyan et al., 2011, 2015). For this reason, pollution is a global concern for all living beings (Ahsan et al. 2019). Bangladesh is one of the most densely populated countries in the world. There are around 30,000 large and small industries in Bangladesh that mostly have an unplanned infrastructure with unworking ETP system and are discharging their untreated or partially treated effluents directly to the surrounding environment which is very alarming. The industries discharged both organic and inorganic pollutants, among which, the persistent inorganic pollutants such as toxic elements including Cr, Cd, Pb, As, and Hg are very harmful to the environment as these can never be destroyed (Islam et.al., 2018; Rahman et. al., 2022) and can have an adverse impact on human health and the environment (Rakib et al. 2013; Chandra et al. 2010).

The soil/sediment is generally the final sink for industrial pollutants (Khan et al. 2019; 2018) and soil contamination due to toxic elements ultimately have an adverse effect on plants and poses a serious risk to human health via the food chain (Hasan et al. 2020). While toxic elements are not biodegradable and cannot be removed biologically, they can be transformed from one form to another and also in one medium to another medium. Phytoremediation, in this regard, could be a possible effective remediation process for the pollution of the toxic elements around the industrial region.

Recent studies have focused on a particular method for toxic element removal, such as electrocoagulation, adsorption using synthetic and natural adsorbents, adsorption using nanomaterials, magnetic field implementation, advanced oxidation processes, membranes, etc. (Qasem et al. 2021). The removal of significant amounts of toxic elements content using these processes is costly and results in massive secondary waste (Ahmadpour et al., 2012). Phytoremediation using native plants growing around the industrial sites could be the best alternative solution to the current situation. Even, in comparison to alternative manual procedures (acid leaching and electrokinetic soil remediation) or natural ways (membrane filtration, ion exchange, and adsorption), the operation cost for phytoremediation is minimal, and there are no environmental side effects. In the present work, a comprehensive study will be carried out to conclude a sustainable green solution for the removal of toxic elements from contaminated industrial sites.

Objectives:

(i) To collect and analyze the industrial effluent, effluent-impacted soil, and the native plants grown naturally on the effluent-impacted soil for the toxic elements by Atomic Absorption Spectrometer (AAS).

(ii) To investigate the level of toxic elements, and evaluate their accumulation, co-distribution, and migration behavior through the effluents, effluent-impacted soil, and native plant samples.

(iii) To disclose the basic and advanced chemistry of elemental transfer from contaminated effluent and soil to the root-to-shoot-to-leaf of native plants.

(iv)To study the up taking capability of the toxic elements by the individual native plants grown in the industrial site.

Progress:

(i)There are a lot of native plants around the industrial region in Gazipur where about 20 potential native plant species commonly grown have been identified and characterized.

(ii) Sample collection has been conducted: the effluents, effluent-impacted soil, and native plant samples were collected, and then sample preparation for metal analysis has been carried out.

(iii) So far, one third of this R&D work has been done.

Ministry of Science and Technology

Government of the People's Republic of Bangladesh

Development of Highly Sensitive Graphene-Based Sensor for Electrochemical Detection of Glucose

Dr. Sabina Yasmin (SSO), (PL), Tajnin jahan (SO), (RA)

Introduction

Diabetes mellitus caused by abnormal level of blood glucose (higher or lower than the range of 3.9-6.1 mM) in bodies is one of the most challenging health problems in 21st century and a main cause of morbidity and mortality in the worldwide. According to the recent report by the International Diabetes Federation (IDF), more than 425 million people are suffering from diabetes and if nothing is done, the affected people will rise to 629 million in 2045. In addition, the high glucose level usually can cause different complications depending on the location, such as kidney, blindness or serious loss of vision, cardiovascular disease and neurological conditions. Therefore, it is important to develop sensitive, rapid and reliable glucose sensors to detect the concentration of glucose in blood which can reduce the risk of multiple concurrent diseases.

To address this issue, we have synthesized graphene based sensor for electrochemical detection of glucose. Graphene is an allotrope of carbon consisting of a single layer of atoms arranged in a two-dimensional honeycomb lattice nanostructure. Owing to these structural characteristics, graphene exhibits outstanding properties, such as high theoretical specific surface area ($\sim$2630 m2 g-1), favorable electronic properties and electron transport capabilities, strong thermal and electrical conductivities and extraordinary pliability and impermeability. These physicochemical properties demonstrate that graphene can provide potential improvements in the properties of novel sensing materials. The large surface area of graphene sheets is helpful for accumulating analyte (glucose) molecules, facilitating enlarge sensing signal and improving sensitivity. In addition, the surface functional groups (epoxy, hydroxyl, phenol, carbonyl, etc.) and the remarkable structure defects such as vacancies and holes can immobilize active species by noncovalent and covalent bonds for sensitive materials. The aims of this project is development of highly sensitive graphene-based sensor for electrochemical glucose detection.

Research Objectives:

i. To develop a highly sensitive graphene based sensor for glucose sensing

ii. To use as a potential device for further real-time clinical applications

Progress/ Outcome

1. Synthesis of graphene based nanocomposite using chemical reduction method.

2. Characterization of as prepared catalyst by XRD, SEM FTIR, and Elemental analyzer.

3. The sensing behavior of prepared sensor has been measured by cyclic voltammetry (CV), differential pulse voltammetry (DPV) and chronoamperometry (CA).

4. Draft writing.

ANNUAL REPORT
2022-2023
(ISO 17025:2017 Accreditation for International Recognition)

Maintaining ISO 17025:2017 Accreditation at INARS

The dependability of test results produced by a laboratory is laid upon a system which follows international standards. One of the standards is ISO 17025:2005 that must be executed in a testing laboratory to demonstrate the authenticity of the test data. The sophistication of the instrument alone does not safeguard good quality data, rather, a complete quality management system, as shown below in the flow chart, will offer internationally acceptable test results. In this context, INARS, formally known as analytical research division, has implemented a complete setup of quality management system since 2009. A quality management system in a testing laboratory requires a great deal of works for continual improvement of a laboratory. The works include developing quality manual (QM), standard operating procedure (SOP), quality system procedure (QSP), quality system forms (QSF), method validation, management review, internal audit etc. A list has been shown in a table below to depict the works involved in maintaining ISO 17025:2005 in the institute. By doing all these works, we received accreditation for twelve (12) water quality parameters in 2009 from NABL, India as a first ever govt. testing laboratory in Bangladesh. The scope of accreditation was expanded to twenty-four (24) in 2012 and subsequently, it was increased to thirty-four (34) in 2014. At present INARS achieved accreditation of eighty-eight (88) water quality parameters from Bangladesh Accreditation Board (BAB).

An ISO accredited laboratory has to manage all of this!

Figure: Process Flow of Maintaining ISO 17025:2017

List of quality system documents developed at INARS as below:

Document Name	Number
Standard operating procedure	88
Quality system procedure	10
Quality system form	30
Method validation	88
Quality manual	1
Quality policy	1
Calibration of pipette	7
Calibration of volumetric flask	50
Control chart	12
Participation in international proficiency testing program	6
Conducting round robin in Bangladesh	7
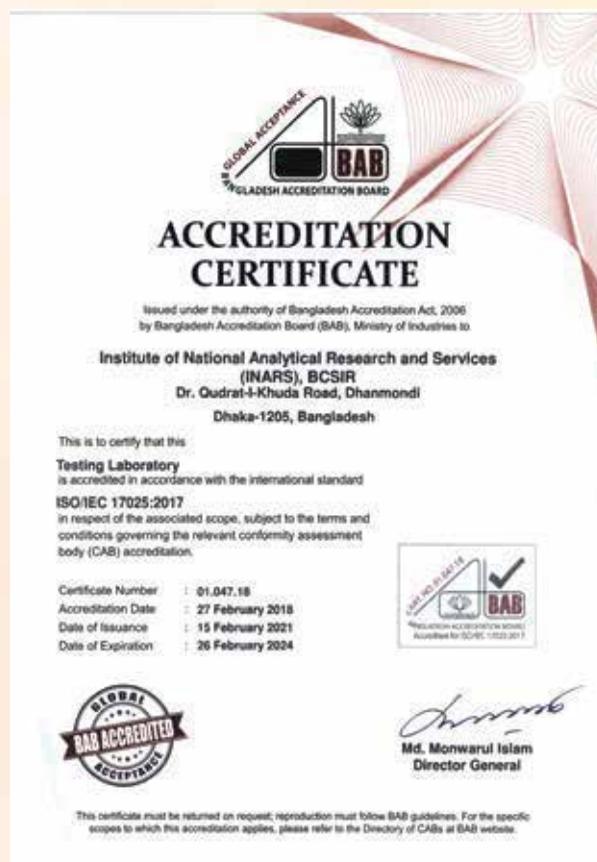
To maintain the tradition of accreditation achievement, a four member of BAB team was invited to conduct the assessment of the laboratories of INARS on January 3, 2021 and INARS team has passed the whole evaluation process successfully and achieved accreditation of 14 new water parameters with a sum of 88 parameters

ANNUAL REPORT
2022-2023
(A Noteworthy Attempt of INARS)

Attempt for safe drinking water

Endeavors to ensure safe drinking water for all

The scientific community in Bangladesh has given their efforts since last few decades in order to mitigate arsenic in drinking water. Still, research has been going on in this field to find possible sustainable options. Many Arsenic Removal Technologies (ARTs) have evolved in the last decades to ensure arsenic safe water. Most of them have not been verified yet for natural arsenic contaminated water. It was necessary to verify the efficacy of the filter using Bangladesh groundwater. Bangladesh Council of Scientific and Industrial Research (BCSIR) is mandated by the Government of Bangladesh to verify performance claims of ART. Subsequently, BCSIR has nominated INARS, previously known as Analytical Research Division (ARD), to perform this work in 2003. Since then, INARS has been involved with the process and continuing its effort to ensure arsenic free drinking water for everyone in Bangladesh. It is noted that ARD conducted performance claims verification of Arsenic Removal Technology (ART) in collaboration with Canadian International Development Agency (CIDA) through ETV-AM and BETV-SAM project in 2003 and 2006, respectively. We verified thirteen (13) arsenic removal technologies and six of them were certified for marketing in Bangladesh.
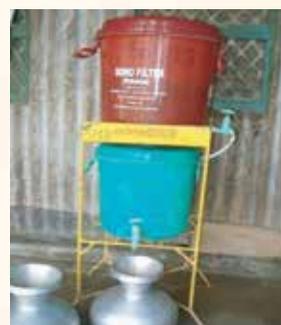
Alcane	Nelima	Read-F

Swadesh	Sidko	Sono

Presently, we have received a number of applications from different proponents for verification of their technologies such as Xiano filter. In addition, we have assessed WASA supply water throughout Dhaka city to investigate any possible contamination. Currently, we have collected so called mineral water bottles from local market to examine correct level of minerals in them.

Institute Name: Institute of National Analytical Research and Service (INARS), BCSIR

(An ISO 17025:2017 Accredited Laboratory)

Process Name	BCSIR Mineral Water
Inventor	Dr. Md.Ahedul Akbor, Md. Ripaj Uddin,Shamim Ahmed,Rokaia Sultana, Shahanaz Sultana,Shakila Akter, Md. AbuBakar Siddique, Dr. Muhammad Abdullah Al Mansur and Md. Aminul Ahsan
Raw Material	$CaCl_2$, $NaHCO_3$, $MgSO_4$ and $NaHCO_3$
Uses	Mineral Water
Statutus Of Development	Waiting for lease out
Product Description	1. We claim that if we could successfully formulate our process, it would be the very first bottled mineral water in Bangladesh ensuring safe drinking water for country people. 2. We affirm cost- effective process development to make safe and healthy drinking water affordable for all of our people. 3. Once the innovation is established, it will help save our country's economic sector by reducing importation of mineral water from abroad. 4. Our assertion is to process mineral water free of harmful bacteria and pathogens 5. We ensure health benefit of the consumers by supplying all required nutrients in appropriate proportion.
Major Plant Equipment/ Machinery	Booster Pump, Multimedia Filler, Activated Carbone Fillter, Softner, UV Unit,Mineral Dosing system, Reverse Osmosis System (RO), Micron Filter System, Ozone plant, Low Comreesor, Water reserver Tank, Automatic bottle blowing machine, feeling machine, Auto lebeling Machine, Date Coding Machine, Full Automatic Wrapping Machine, Hydraulic Trolly, Cooling Tower, Water Chiller, Vacuum Auto Loader, & Crusher.

ANNUAL REPORT
2022-2023

(Publications, Training, Conference and Others)

Publication List

1. Halder, M., Rahman, T., Mahmud, A., Jim, S. A., Akbor, M. A., *Siddique, M. A. B., & Joardar, J. C. (2022). Are the vegetables grown in the soil of municipal solid waste dumping sites safe for human health? An assessment from trace elements contamination and associated health risks. Environmental Nanotechnology, Monitoring & Management, 18, 100731. https://doi.org/10.1016/j.enmm.2022.100731

2. Jannat, J. N., Khan, M. S. I., Islam, H. M. T., Islam, M. S., Khan, R., Siddique, M. A. B., ... & Islam, A. R. M. T. (2022). Hydro-chemical assessment of fluoride and nitrate in groundwater from east and west coasts of Bangladesh and India. Journal of Cleaner Production, 372, 133675. https://doi.org/10.1016/j.jclepro.2022.133675

3. Anik, A. H., Khan, R., Hossain, S., Siddique, M. A. B., Tamim, U., Islam, A. R. M. T., Idris, A. M., & Tareq, S. M. (2022). Reconciling the geogenic and non-crustal origins of elements in an Indo-Bangla transboundary river, Atrai: Pollution status, sediment quality, and preliminary risk assessment. Environmental Research, 214, 114134. https://doi.org/10.1016/j.envres.2022.114134

4. Hossain, S., Khan, R., Anik, A. H., Siddique, M. A. B., Tamim, U., Islam, A. R. M. T., Idris, A. M., & Khaleque, M. A. (2022). Natural and anthropogenic contribution to the elemental composition and subsequent ecological consequences of a transboundary river's sediments (Punarbhaba, Bangladesh). Environmental Research, 114444. https://doi.org/10.1016/j.envres.2022.114444

5. Hasan, A. B., Reza, A. H. M. S., Siddique, M. A. B., Akbor, M. A., Nahar, A., Hasan, M., Zaman M. N., Hasan, M. I., & Moniruzzaman, M. (2022). Spatial distribution, water quality, human health risk assessment, and origin of heavy metals in groundwater and seawater around the ship-breaking area of Bangladesh. Environmental Science and Pollution Research, 1-26. https://doi.org/10.1007/s11356-022-23282-4

6. Haque, M. R., Ali, M. M., Ahmed, W., Siddique, M. A. B., Akbor, M. A., Islam, M. S., & Rahman, M. M. (2022). Assessment of microplastics pollution in aquatic species (fish, crab, and snail), water, and sediment from the Buriganga River, Bangladesh: An ecological risk appraisals. Science of The Total Environment, 159344. https://doi.org/10.1016/j.scitotenv.2022.159344

7. Ul-Haque, J., Siddique, M. A. B., Islam, M. S., Ali, M. M., Tokatli, C., Islam, A., ... & Islam, A. R. M. T. (2022). Effects of COVID-19 era on a subtropical river basin in Bangladesh: Heavy metal (loid) s distribution, sources and probable human health risks. Science of The Total Environment, 159383. https://doi.org/10.1016/j.scitotenv.2022.159383

8. Nasiruddin, M., Islam, A. R. M. T., Siddique, M. A. B., Hasanuzaman, M., Hassan, M. M., Akbor, M. A., ... & Kumar, S. (2022). Distribution, sources, and pollution levels of toxic metal (loid) s in an urban river (Ichamati), Bangladesh using SOM and PMF modeling with GIS tool. Environmental Science and Pollution Research, 1-25. https://doi.org/10.1007/s11356-022-23617-1

9. Islam, M. N., Ganguli, S., Saha, N., Khatun, F., Karim, R., Tanvir, E. M., Howlader, S., Siddique, M. A. B., Peng, C., & Ng, J. C. (2022). Effects of shipwrecks on spatiotemporal dynamics of metal/loids in sediments and seafood safety in the Bay of Bengal. Environmental Pollution, 120452. https://doi.org/10.1016/j.envpol.2022.120452

10. Kormoker, T., Karmoker, R., Uddin, M., Kabir, M. H., Siddique, M. A. B., Khan, R., Islam, M. S., Al, M. A., Alam, M., Ustao?lu, F., Islam, M., & Idris, A. M. (2022). Toxic elemental abundances in the sediment of the Jamuna River, Bangladesh: pollution status, sources, toxicity, and ecological risks assessment. International Journal of Environmental Analytical Chemistry. https://doi.org/10.1080/03067319.2022.2134781

11. Sultan, M. B., Rahman, M. M., Khatun, M. A., Shahjalal, M., Akbor, M. A, Siddique, M. A. B., Huque, R., & Malafaia, G. (2022). Microplastics in different fish and shellfish species in the mangrove estuary of Bangladesh and evaluation of human exposure. Science of The Total Environment, 858(1), 159754. https://doi.org/10.1016/j.scitotenv.2022.159754

12. Hossain, M. N., Rahman, M. M., Afrin, S., Akbor, M. A., Siddique, M. A. B., & Malafaia, G. (2022). Identification and quantification of microplastics in agricultural farmland soil and textile sludge in Bangladesh. Science of The Total Environment, 160118. https://doi.org/10.1016/j.scitotenv.2022.160118

13. Rahman, F., Patwary, M. A. M., Siddique, M. A. B., Bashar, M. S., Haque, M.A., Akkter, B., Rashid, R., Haque, M. A., & Uddin, A. K. M. R. (2022). Green synthesis of zinc oxide nanoparticles using Cocos nucifera leaf extract: characterization, antimicrobial, antioxidant and photocatalytic activity. Royal Society Open Science, 9, 220858, https://doi.org/10.1098/rsos.220858

14. Hredoy, R. H., Siddique, M. A. B., Akbor, M. A., Shaikh, M. A. A., & Rahman, M. M. (2022). Impacts of Landfill Leachate on the Surrounding Environment: A Case Study on Amin Bazar Landfill, Dhaka (Bangladesh). Soil Systems, 6(4), 90. https://doi.org/10.3390/soilsystems6040090

15. Rahman, M. S., Reza, A. H. M. S., Ahsan, M. A., & Siddique, M. A. B. (2022). Arsenic in groundwater from Southwest Bangladesh: Sources, water quality, and potential health concern. HydroResearch. 6, 1-15. https://doi.org/10.1016/j.hydres.2022.12.001

16. Siddique, M. A. B., Bithi, U. H., Ahmed, A. N., Gafur, M. A., Reaz, A. H., Roy, C. K., Islam, M. M., & Firoz, S. H. (2022). Preparation of Manganese Oxide Nanoparticles with Enhanced Capacitive Properties Utilizing Gel Formation Method. ACS Omega. 7, 51, 48007-48017. https://doi.org/10.1021/acsomega.2c05872

17. Ferdousi, L., Begum, M., Yeasmin, M. S., Uddin, J., Miah, M. A., Rana, G.M. M., Chowdhury, T. A., Boby, F., Maitra, B., Khan, R., Emran, T. B., & *Siddique, M. A. B. (2023). Facile acid fermentation extraction of silkworm pupae oil and evaluation of its physical and chemical properties for utilization as edible oil. Heliyon, 9(1), e12815, https://doi.org/10.1016/j.heliyon.2023.e12815

18. Jamal, A. H. M. S. I. M., Tarek, Y. A., *Siddique, M. A. B., Shaikh, M. A. A., Debnath, S. C., Uddin, M. R., Ahmed, S., Akbor, M. A., Al-Mansur, M. A., Islam, A. R. M. T., Khan, R., Moniruzzaman, M., & Sultana, S. (2023). Development of a fabricated first-flush rainwater harvested technology to meet up the freshwater scarcity in a South Asian megacity, Dhaka, Bangladesh. Heliyon, e13027, https://doi.org/10.1016/j.heliyon.2023.e13027

19. Nawar, N., Rahman, M. M., Chowdhury, F. N., Marzia, S., Ali, M. M., Akbor, M. A., Siddique, M.A.B., Khatun, M. A., Shahjalal, M., Huque, R., & Malafaia, G. (2023). Characterization of microplastic pollution in the Pasur river of the Sundarbans ecosystem (Bangladesh) with emphasis on water, sediments, and fish. Science of the Total Environment, 161704, https://doi.org/10.1016/j.scitotenv.2023.161704

20. Kubra, K., Mondol, A. H., Ali, M. M., Islam, M. S., Akhtar, S., Ahmed, A. S. S., Bhuyan, M. S., Rahman, M. M., Siddique, M. A. B., & Islam, A. R. M. T. (2023). Assessment of As, Cr, Cd, and Pb in urban surface water from a subtropical river: contamination, sources, and human health risk. International Journal of Environmental Analytical Chemistry, https://doi.org/10.1080/03067319.2023.2170232

21. Baroi, A., Siddique, M. A. B., Akbor, M. A., Chowdhury, F. N., Jamil, M. A. R., Uddin, M. K., & Rahman, M. M. (2023). Exposure and Health Risks of Metals in Imported and Local Brands' Lipsticks and Eye Pencils from Bangladesh. Environmental Science and Pollution Research, https://doi.org/10.1007/s11356-023-25416-8

22. Uddin, M., Kormoker, T., *Siddique, M. A. B., Billah, M. M., Rokonuzzaman, M., Al Ragib, A., Proshad, R., Hossain, M. Y., Haque, M. K., Ibrahim, K. A., & Idris, A. M. (2023). An overview on water quality, pollution sources, and associated ecological and human health concerns of the lake water of megacity: a case study on Dhaka city lakes in Bangladesh. Urban Water Journal, 1-17,

    https://doi.org/10.1080/1573062X.2023.2169171

23. Rashid, M. B., Sheik, M. R., Haque, A. J. M. E., *Siddique, M. A. B., Habib, M. A., & Patwary, M. A. A. (2023). Salinity-induced change in green vegetation and land use patterns using remote sensing, NDVI, and GIS techniques: A case study on the southwestern coast of Bangladesh. Case Studies in Chemical and Environmental Engineering, 7, 100314, https://doi.org/10.1016/j.cscee.2023.100314

24. Halder, M., Jim, S. A., Rahman, T., Joardar, J. C., Siddique, M. A. B., Islam, M. S., Islam, M. U., Liu, S., Rabbi, S., & Peng, X. (2023). Effects of straw incorporation and straw-burning on aggregate stability and soil organic carbon in a clay soil of Bangladesh. Geoderma Regional, e00620, https://doi.org/10.1016/j.geodrs.2023.e00620

25. Akter, R., Akbor, M. A., Siddique, M. A. B., Shammi, M., & Rahman, M. M. (2023). Occurrence and health risks assessment of polycyclic aromatic hydrocarbons (PAHs) in road dust and soil samples at Dhaka city, Bangladesh. Case Studies in Chemical and Environmental Engineering, 7, 100304, https://doi.org/10.1016/j.cscee.2023.100304

26. Islam, M. S., Nakagawa, K., Abdullah-Al-Mamun, M., Siddique, M. A. B., & Berndtsson, R. (2023). Toxicity and source identification of pollutants in an urban river in Bangladesh. Environmental Earth Sciences, 82(6), 140, https://doi.org/10.1007/s12665-023-10812-7

27. Ahmed, W., Haque, M. R., Siddique, M. A. B., Akbor, M. A., Hasan, M., & Rahman, M. M. (2023). Is Biofloc fish a safe alternative to conventionally cultivated fish regarding metal bioaccumulation in Bangladesh? Environmental Challenges, 100704, https://doi.org/10.1016/j.envc.2023.100704

28. Mia, M. Y., Islam, A. R. M. T., Jannat, J. N., Jion, M. M. M. F., Sarker, A., Tokatli, C., Siddique, M. A. B., Ibrahim, S. M., & Senapathi, V. (2023). Identifying factors affecting irrigation metrics in the Haor basin using integrated Shannon's entropy, fuzzy logic and automatic linear model. Environmental Research, 115688, https://doi.org/10.1016/j.envres.2023.115688

29. Akter, A., Goto, M., Noor, M. J. M. M., Parvez, A., Khanam, S., Siddique, M. A. B., Hossain, M. F., & Kormoker, T. (2023). Immobilization of heavy metals in tannery sludge by the formation of tobermorite in subcritical water treatment with rice husk silica. RSC advances, 13(16), 10610-10620. https://doi.org/10.1039/D3RA00595J

30. Moni, F. N., Miazi, M. S. A., Kabir, M. H., Shammi, R. S., Islam, M. S., Islam, M. S., Sarker, M. E., Khan, M. M. H., Ahammed, M. S., *Siddique, M. A. B., & Kormoker, T. (2023). Enrichment, sources, and distributions of toxic elements in the farming land's topsoil near a heavily industrialized area of central Bangladesh, and associated risks assessment. Heliyon, 9 (4), e15078. https://doi.org/10.1016/j.heliyon.2023.e15078

31. Akhter, N., Alam, M., Khan, M. R. A., Sharmin, S., Emon, N. U., Siddique, M. A. B., Hossain, K. H., & Rahman, M. A. (2023). Therapeutic potentials of Adenostemma lavenia (L.) O. Kuntze evidenced into an array of pharmacological effects and ligand-receptor interactions. Heliyon, 9 (4), e15541. https://doi.org/10.1016/j.heliyon.2023.e15541

32. Jannat, J. N., Mia, M. Y., Jion, M. M. M. F., Islam, M. S., Ali, M. M., Siddique, M. A. B., Rakib, M. R. J., Ibrahim, S. M., Pal, S. C., Costache, R., Malafaia, G., Islam, A. R. M. T. (2023). Pollution trends and ecological risks of heavy metal (loid)s in coastal zones of Bangladesh: A chemometric review. Marine Pollution Bulletin, 191, 114960. https://doi.org/10.1016/j.marpolbul.2023.114960

33. Diganta, M. T. M., Saifullah, A. S. M., *Siddique, M. A. B., Mostafa, M., Sheikh, M. S., Uddin, M. J. (2023). Macroalgae for biomonitoring of trace elements in relation to environmental parameters and seasonality in a sub-tropical mangrove estuary. Journal of Contaminant Hydrology, 104190. https://doi.org/10.1016/j.jconhyd.2023.104190

34. Abedin, M. J., Khan, R., Siddique, M. A. B., Khan, A. H. A. N., Islam, M. T., & Rashid, M. B. (2023).Metal (loid)s in tap-water from schools in central Bangladesh (Mirpur): Source apportionment, water quality, and health risks appraisals. Heliyon, e15747. https://doi.org/10.1016/j.heliyon.2023.e15747

35. Ali, M. M., Afrin, S., Siddique, M. A. B., Bodrud-Doza, M., & Rahman, M. M. (2022). Metal contamination in groundwater of Bangladesh. In Current Directions in Water Scarcity Research, 5, 109-131. Elsevier (Scopus Indexed). https://doi.org/10.1016/B978-0-323-85378-1.00008-8

36. Jahan, T., Yasmin, S., Shaikh, M. A. A., Yousuf, M. J. I., Islam, M. S., Choudhury, M. T. I., & Kabir, M. H. (2023). Development and validation of a modified QuEChERS method coupled with LC-MS/MS for simultaneous determination of difenoconazole, dimethoate, pymetrozine, and chlorantraniliprole in brinjal collected from fields and markets places to assess human health risk. Heliyon, 9(4). https://DOI: 10.1016/j.heliyon.2023.e14972

37. Islam, S. F., Kabir, M. H., Yasmin, S., Alam, M. J., Ahmed, S., & Rahman, M. S. (2023). A modified QuEChERS method development to analyze tylosin and metronidazole antibiotics residue in shrimp (Penaeus monodon) using LC-ESI MS/MS. Frontiers in Sustainable Food Systems, 7, 59. https://doi.org/10.3389/fsufs.2023.1013319

38. Upoma, B. P., Yasmin, S., Ali Shaikh, M. A., Jahan, T., Haque, M. A., Moniruzzaman, M., & Kabir, M. H. (2022). A fast adsorption of azithromycin on waste-product-derived graphene oxide induced by H-bonding and electrostatic interactions. ACS omega, 7(34), 29655-29665. https://doi.org/10.1021/acsomega.2c01919

39. Habibullah-Al-Mamun, M., Tanima, S. A., Paul, B., Al Zahid, M., Kabir, M. H., Ahmed, S., & Hossain, A. (2023). Occurrence of organochlorine pesticides (OCPs) residues in farmed and wild fish in Bangladesh and implications for human health. Exposure and Health, 15(2), 425-437.https://doi.org/10.1007/s12403-022-00501-4

40. Yasmin, S., Kabir, M. H., Roy, N., & Jeon, S. (2023). The Effect of Reducing Agent for Synthesizing Palladium Nanoparticle on Carbon Nanotube Support and Its Superior Catalytic Activity towards Methanol Oxidation Reaction. ECS Advances.

41. Mohiuddin, A. K., Yasmin, S., & Jeon, S. (2023). CoxNi1? x double hydroxide decorated graphene NPs for simultaneous determination of dopamine and uric acid. Sensors and Actuators A: Physical, 355, 114314.

42. Al-Mansur, M. A., Siddiqi, M. M. A., & Saha, K. (2023). Four bioactive compounds isolated from the stem of Anethum sowa L. and their bioactivities. Plant Science Today., https://doi.org/10.14719/pst.2187

43. Islam, M. M., Hossain, M. J., Zahan, M. S., Nur, F., Al Mansur, M. A., & Rashid, M. A. (2023). Stixis suaveolens (Roxb.) Fruit Extract Deciphered Antidepressant and Antidiarrheal Effects via In vivo Approach. Bangladesh Pharmaceutical Journal, 26(1), 28-35.

44. Ahmed, K. S., Farzana, M., Rahman, S. E., Jahan, I. A., Khan, T. A., Al-Mansur, M. A., ... & Hossain, H. (2023). Viscum monoicum: A New Source of Polyphenolic Compounds Responsible for Antioxidant and Anti-Inflammatory Activities. Journal of Herbs, Spices & Medicinal Plants, 1-20.https://doi.org/10.1080/10496475.2023.2182394, 2023 Taylor & Francis Group, LLC.

45. Islam, M. S., Al Mansur, M. A., Rakhi, S. A., Sarkar, M. R., Kuddus, M. R., & Ahmed, F. (2022). Antioxidant, thrombolytic, cytotoxic and antibacterial activities of leaves of Vitex peduncularis. Bangladesh Journal of Scientific and Industrial Research, 57(4), 239-246. DOI: https://doi.org/10.3329/bjsir.v57i4.62651.

46. Uddin, M. R., Khandaker, M. U., Abedin, M. J., Akter, N., Molla Jamal, A. S. I., Sultana, R., ... & Sulieman, A. (2021). Quality assessment of bottled and unbottled drinking water in Bangladesh. Water, 13(15), 2026.

47. Rahman, M. M., Yeasmin, M. S., Uddin, M. J., Hasan, M., Shaikh, M. A. A., Rahman, M. S., & Maniruzzaman, M. (2023). Simultaneous abatement of Ni2+ and Cu2+ effectually from industrial wastewater by a low cost natural clay-chitosan nanocomposite filter: Synthesis, characterization and fixed bed column adsorption study. Environmental Nanotechnology, Monitoring & Management, 20, 100797.

48. Nasiruddin, M., Islam, A. R. M. T., Siddique, M. A. B., Hasanuzaman, M., Hassan, M. M., Akbor, M. A., ... & Kumar, S. (2023). Distribution, sources, and pollution levels of toxic metal (loid) s in an urban river (Ichamati), Bangladesh using SOM and PMF modeling with GIS tool. Environmental Science and Pollution Research, 30(8), 20934-20958.

49. Tarek, Y. A., Debnath, S. C., Uddin, M. R., Ahmed, S., Moniruzzaman, M., Jahan, T., ... & Jamal, A. S. I. M. (2022). Harvested rainwater quality of Dhaka and its importance as the alternative to surface and groundwater. ECS Transactions, 107(1), 18813.

50. Mubin, A. N., Arefin, S., Mia, M. S., Islam, A. R. M. T., Bari, A. M., Islam, M. S., ... & Malafaia, G. (2023). Managing the invisible threat of microplastics in marine ecosystems: Lessons from coast of the Bay of Bengal. Science of The Total Environment, 164224. Science of the Total Environment (SCI and Scopus Indexed Q1 Journal, IF: 10.753), DOI: https://doi.org/10.1016/j.scitotenv.2023.164224

51. Rahman, M. S., Reza, A. H. M., Siddique, M. A. B., Akbor, M. A., & Hasan, M. (2023). Accumulation of arsenic and other metals in soil and human consumable foods of Meherpur district, southwestern Bangladesh, and associated health risk assessment. Environmental Sciences Europe, 35(1), 1-22..DOI: https://doi.org/10.1186/s12302-023-00751-2

52. Akter, B., Shammi, M., Akbor, M. A., Yasmin, S., Nahar, A., Akhter, S., & Uddin, M. K. (2023). Preparation and characterization of biochar: A case study on textile and food industry sludge management. Case Studies in Chemical and Environmental Engineering, 7, 100282.

53. Nahar, A., Akbor, M. A., Pinky, N. S., Chowdhury, N. J., Ahmed, S., Gafur, M. A., ... & Chowdhury, F. (2023). Waste newspaper driven activated carbon to remove polycyclic aromatic hydrocarbon from wastewater. Heliyon.

54. Pinky, N. S., Mobarak, M. B., Mustafi, S., Rahman, M. Z., Nahar, A., Saha, T., & Bahadur, N. M. (2023). Facile preparation of micro-porous biochar from Bangladeshi sprouted agricultural waste (corncob) via in-house built heating chamber for cationic dye removal. Arabian Journal of Chemistry, 105080.

Training offered

❖ Mehedi hasan and Abu Bakar Siddique provided six days long 81st training program of NITUB on the use, maintenance, trouble-shooting and applications of Atomic Absorption Spectrometer (AAS) organized by Network of Instrument Technical personnel and User scientists of Bangladesh (NITUB) during 24-30, December 2022 at Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.

❖ A. H. M. Shofiul Islam Molla Jamal successfully completed In house training on Nuclear Magnetic Resonance (NMR) held on 05-09 November, 2021

❖ Dr. Humayun offered Training Course on Gas Chromatography Mass Spectrophotometer (GC-MS), 13-17 February 2022, INARS, Bangladesh Council of Scientific and Industrial Research (BCSIR).

❖ Dr. Humayun offered Training Course on Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS), 09-23 April 2023, Central Analytical and Research Facilities (CARF), Bangladesh Council of Scientific and Industrial Research (BCSIR).

Training obtained

❒ Dr. Sabina obtained 81st training programme of NITUB on **'Atomic Absorption Spectroscopy (AAS)**, held on 24, 26-30 December 2022 at INARS, BCSIR, Dhaka.

❒ Tajnin jahan Successfully completed the in-house training on "**Gas Chromatography – Mass Spectometry (GC-MS)**" organized by **INARS**, BCSIR during 15-19 January, 2023 at Bangladesh Council of Scientific and Industrial Research (**BCSIR**), Dhaka, Bangladesh.

❒ Tajnin Jahan attended and successfully completed the in-house training as a trainer on "**Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)**" conducted by **Center for Analytical and Research Facilities, BCSIR, Dhaka** during 09-13 April, 2023 at Bangladesh Council of Scientific and Industrial Research (**BCSIR**), Dhaka, Bangladesh

❒ Rashed Mahmud attended and successfully completed the Training program on "**Programmable Logic Controller (PLC)**" organized by **Planning and Development Division, BCSIR, Dhaka** during 02-06 April 2023 at Bangladesh Council of Scientific and Industrial Research (**BCSIR**), Dhaka, Bangladesh.

❒ Rashed Mahmud attended and successfully completed the Training program on "**Ultra violet, Visible and Infrared (UV-VIS & IR) Spectrometer**" organized by **Network of Instrument Technical personnel and User Scientists of Bangladesh (NITUB)** held from 06-11 May 2023 at Department of Chemistry, University of Dhaka.

❒ Mehedi hasan attended and successfully completed the Training program on "**Nuclear Magnetic Resonance (NMR)**" organized by **Planning and Development Division, BCSIR, Dhaka** during 16-20 October 2022 at Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.

❒ Mehedi Hasan Attended and successfully completed the Training program on "**Inductively Coupled Plasma Mass Spectrometry (ICPMS)**" organized by **Central Analytical Research Facilities (CARF), BCSIR, Dhaka** during 12-16 February 2023 at Bangladesh Council of Scientific and Industrial Research **(BCSIR),** Dhaka, Bangladesh.

❒ H. M. Shofiul Islam Molla Jamal successfully completed In house training on "**Wavelength Dispersive X-Ray Fluorescence (WD-XRF)**" held on 06-10 March, 2022

❒ Atikur Rahman attended and successfully completed the Training program on "**Inductively Coupled Plasma Mass Spectrometer**" organized by Planning and Development Division, BCSIR, Dhaka during 12-16 February 2023 at Bangladesh Council of Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh.

❒ Sharmin Ahmed attended and successfully completed the Training program on Operation and maintenance of "**Dumas Protein Analyzer and Fat extractor**" held on 04-08 December 2022.

Participation in Seminar/Conference/Symposium

1. Dr. Humayun Participated as oral presenter in BCSIR, Bangladesh-CSIR, India, Joint symposium held on 30-31 May 2022 at BCSIR, Dhaka, Bangladesh.

2. Sharmin Ahmed participated on oral presentation titled on "`Isolation and Characterization of Arsenic Resistant Bacteria from Garden Soil and Evaluate Their Role in Salt Tolerance and N2 Cycle" in BCSIR Congress-2022, 01-03 December 2022, BCSIR Dhaka, Bangladesh ("Integrated Approach for Adapting 4IR")

3. Dr. Sabina Yasmin participated as oral presenter in International Conferences on Environmental Protection for Sustainable Development (ICEPSD-2022), held on 2-4 September 2022 at University of Dhaka, Bangladesh

4. Participated as oral presenter in BCSIR Congress-2022, held on 01-03 December 2022 at BCSIR, Dhaka, Bangladesh

5. Md. Abu Bakar Siddique. Handling and Management of Chemicals in the Laboratory and Industry: Chemical Safety, Security, and Risk Mitigation Strategies. International Conference on Environmental Protection for Sustainable Development (ICEPSD)-2022 organized by the Forest and Environment Affairs sub-committee of Bangladesh Awami League on 02-04 September 2022. Serial number: PP-39, Technical Session: TS-F (Innovations in Environmental Science and Engineering). Day 2: 03 September 2022 (Saturday).

6. Md. Abu Bakar Siddique*, Ummey Hafsa Bithi, Aninda Nafis Ahmed, M. A. Gafur, Akter Hossain Reaz, Chanchal Kumar Roy, Md. Mominul Islam, Shakhawat H. Firoz. Preparation of Manganese Oxide Nanoparticles with Enhanced Capacitive Properties Utilizing Gel Formation Method. International Conference on Environmental Protection for Sustainable Development (ICEPSD)-2022 organized by the Forest and Environment Affairs sub-committee of Bangladesh Awami League on 02-04 September 2022. Serial number: OP-F4, Technical Session: TS-F (Innovations in Environmental Science and Engineering). Day 1: 02 September 2022 (Friday).

7. Mehedi Hasan, Md. Abu Bakar Siddique, Md. Moazzem Hossain, Md. Ahedul Akbor, Rahat Khan, Sayed M. A. Salam. Toxic elements in the commercially available branded cigarettes in Bangladesh and evaluation of human health risks associated with inhalation exposure. International Conference on Environmental Protection for Sustainable Development (ICEPSD)-2022 organized by the Forest and Environment Affairs sub-committee of Bangladesh Awami League on 02-04 September 2022. Serial number: OP-J2, Technical Session: TS-J (Toxicology). Day 1: 02 September 2022 (Friday).

8. Participated in 'International Conference on Environmental Protection for Sustainable Development (ICEPSD)-2022' organized by the Forest and Environment Affairs sub-committee of Bangladesh Awami League on 02-04 September 2022 and presented an oral presentation entitled "Toxic elements in the commercially available branded cigarettes in Bangladesh and evaluation of human health risks associated with inhalation exposure".

9. Participated in 'BCSIR Congress -2022', organized by BCSIR, Dhaka, Bangladesh on 1-3 December 2022 and presented an oral presentation entitled "Graphene oxide, cellulose, and chitosan based adsorbents for the removal of Cd and Pb from contaminated water".

Bangladesh Council of Scientific and Industrial Research
Institute of National Analytical Research and service (INARS)
In-house Training schedule-2022-2023(July- June)

INARS always organizes hands on practical training internally all the year around.it provides practical knowledge of a certain research parameter to the scientists of INARS.

Sl. No.	Name of the parameter	Name of the Instrument	Date/ Day	Trainee	Trainer	Supporting Staff	Course coordinator
1.	^{1}H & ^{13}C	NMR Spectrometer	16-17 October 22	Shofiul Islam Mollah Jamal, SSO Md. Ripaj Uddin, SO Aynun Nahar, SO	Shamim Ahmed, PSO Dr. Muhammad Abdullah Al Mansur, PSO	Sahela Sultana, LDA Nurul Islam, Jr. Tech	Md. Ahedul Akbor, SSO
2.	C,H,N,S	Elemental Analyzer	30-31 October 22	Md. Abu Bakar Siddique, SSO Ismail Hossain, RC Tajnin Jahan, SO	Shamim Ahmed, PSO Dr. Sabina Yasmin, SSO	Sahela Sultana, LDA Moin Uddin, Lab Attendnt.	Dr. Muhammad Abdullah Al Mansur, PSO
3.	Residual Alcohols, PAH	Gas Chromatograph (GC)	09-10 November 22	Dr. Sabina Yasmin, SSO Shahnaz Sultana , SO Md. Mehedi Hasan, SO	Md. Ahedul Akbor, SSO Aynun Nahar, SO	Sahela Sultana, LDA Md. Abu Hanif, Lab Attendant	Shamim Ahmed, PSO
4.	Alkalinity, Free Chlorine	Titrimetric	23-24 November 22	Khondoker Pervaze Ahmed,Technician Md. Saleh Ahmed, Technician Md. Shahjalal Sarker, Jr. Tech.	Md. Ahedul Akbor, SSO Shofiul Islam Mollah Jamal, SSO	Sahela Sultana, LDA Jomir Ali, Lab Attendant	Shamim Ahmed, PSO
5.	Phosphate, NH$_3$	UV-Visible Spectrometer	07-08 December 22	Md. Abu Bakar Siddique, SSO Md. Mehedi Hasan, SO Md. Ismail Hossain, RC	Dr. Muhammad Abdullah Al Mansur, PSO Tajnin Jahan, SO	Sahela Sultana, LDA Md. Shiper Miah, Lab Attendant	Shamim Ahmed, PSO
6.	Na, K	Flame Photometer	14-15 December 22	Tajnin Jahan, SO Md. Saleh Ahmed, Jr. Tech. Md. Shahjalal Sarker, Jr. Tech.	Md. Ahedul Akbor, SSO Md. Abu Bakar Siddique, SSO	Sahela Sultana, LDA Md. Abu Hanif, Lab Attendant	Shamim Ahmed, PSO
7.	pH, Conductivity	Multimeter	04-05 January 23	Shahnaz Sultana, SO Md. Saleh Ahmed, Jr. Tech. Jahangir Alam, Jr. Tech.	Dr. Muhammad Abdullah Al Mansur PSO Dr. Humayun Kabir, SSO	Woaz Kazi, LDA Ahammad Ali Islam, Lab. Tech	Md. Ahedul Akbor, SSO
8.	TDS,TSS	Gravimetric	18-19 January 2023	Md. Khandaker Parvez Ahammed , Jr. Tech. Md. Saleh Ahmed, Jr. Tech. Md. Shahjalal Sarker, Jr. Tech.	Dr. Sabina Yasmin, SSO Md. Abu Bakar Siddique, SSO	Sahela Sultana, LDA Nurul Islam, Jr. tech	Dr. Muhammad Abdullah Al Mansur, PSO
9.	COD, BOD	Titrimetric	08-09 February 23	Md. Khandaker Parvez Ahammed , Jr. Tech. Md. Moin Uddin, Lab Attendnt. Md. Shiper Miah, Lab Attendnt.	Shahnaz Sultana, SO Md. Jahangir Alam, Jr. Tech.	Amir Hossain, MLSS Nasima Begum, Jr. Tech.	Md. Ahedul Akbor, SSO

Sl. No.	Name of the parameter	Name of the Instrument	Date/ Day	Trainee	Trainer	Supporting Staff	Course coordinator
10.	Color, NH_3	UV-Visible Spectrometer	22-23 February 23	Aynun Nahar, SO Shahnaz Sultana, SO Md. Ismail Hossain, RC	Tajnin Jahan, SO Md. Ripaj Uddin, SO	Woaz Kazi, LDA Jahangir Alam, Jr. Tech.	Dr. Muhammad Abdullah Al Mansur, PSO
11.	Acidity, CO_2, Hardness	Titrimetric	01-02 March 23	Md. Khandaker Parvez Ahammed, Jr. Tech. Jomir Ali, Lab Attendant. Md. Shahjalal Sarker, Jr. Tech.	A. H.M. Shofiul Islam Mollah Jamal, SSO Md. Ripaj Uddin, SO	Sahela Sultana, LDA Md. Abu Hanif, Lab Attendnt.	Dr. Muhammad Abdullah Al Mansur, PSO
12.	Arsenic (As), Mercury (Hg)	AAS	16-17 March 23	Dr. Humayun Kabir, SSO Dr. Sabina Yasmin, SSO Md. Ripaj Uddin, SO	Md. Abu Bakar Siddique, SSO Md. Mehedi Hasan, SO	Ahammad Ali Islam, Lab. Tech Nasima Begum, Jr. Tech.	Md. Ahedul Akbor, SSO
13.	H_2O_2, Glycerene	Titrimetric	05-06 April 23	Md. Abu Bakar Siddique, SSO Sharmin Ahmed, SO Md. Jahangir Alam, Jr. Tech	Dr. Humayun Kabir, SSO A. H.M. Shofiul Islam Mollah Jamal, SSO	Sahela Sultana, LDA Nurul Islam, Jr. Tech.	Dr. Muhammad Abdullah Al Mansur, PSO
14.	Ecoli, Coliform	Microbiological	16-17 April 23	Dr. Humayun Kabir, SSO Sharmin Ahmed, SO Md. Ripaj Uddin, SO	Shahnaz Sultana , SO Dr. Sabina Yasmin, SSO	Sahela Sultana, LDA Amir Hossain, MLSS	Md. Ahedul Akbor, SSO
15.	Leas (Pb), Cadmium (Cd)	AAS	10-11 May 23	Sharmin Ahmed, SO Shofiul Islam Mollah Jamal, SSO Aynun Nahar, SO	Md. Abu Bakar Siddique, SSO Md. Mehedi Hasan, SO	Woaz Kazi, LDA Nasima Begum, Jr. Tech.	Dr. Muhammad Abdullah Al Mansur, PSO
16.	Turbidity, Salinity	Multimeter	24-25 May 23	Md. Ismail Hossain, RC Md. Jahangir Alam, Jr. Tech Md. Moin Uddin, Lab. Attendnt.	Dr. Humayun Kabir, SSO Dr. Sabina Yasmin, SSO	Sahela Sultana, LDA Md. Shiper Miah, Lab Attendnt.	Md. Ahedul Akbor, SSO
17.	Total N_2	Kjheldal Nitrogen	07-08 June 23	Shofiul Islam Mollah Jamal, SSO Md. Mehedi Hasan, SO Sharmin Ahmed, SO	Dr. Humayun Kabir, SSO Aynun Nahar, SO	Woaz Kazi, LDA Amir Hossain, MLSS	Dr. Muhammad Abdullah Al Mansur, PSO
18.	Caffeine	HPLC	18-19 June 23	Dr. Sabina Yasmin, SSO Tajnin Jahan, SO Sharmin Ahmed, SO	Dr. Humayun Kabir, SSO A. H.M. Shofiul Islam Mollah Jamal, SSO	Sahela Sultana, LDA Md. Moin Uddin, Lab. Attendnt.	Md. Ahedul Akbor, SSO

Student Supervision

Name and session of students	Name of university	Subject	Degree	Title of thesis	Name of Supervisor	Working Duration
Md. Sumon Ahmed, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Analysis of Antibiotic residue in Poultry Chicken	Dr. Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Nishat Tasnim Bristy, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	An efficient adsorptive removal of Bisphenol-A from river water of	Dr. Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Khadija Akhter Poly, Session: 2020-2021	Jagannath University	Pharmacy	M.S.	Development and characterization of Artificial Blood	Dr. Muhammad Abdullah Al-Mansur, PSO	02.01.2023-01.01.2024
Abir Sufi Islam, Session: 2022-2023	Jahanginagar University	Environmental Science	M.S.	Elemental contamination level in the water, sediment and aquatic species (fish, crab and snail) in the Buriganga river and associated risks assessment	Md. Abu Bakar Siddique, SSO	02.01.2023-01.01.2024
Sunjida Akhter, Session: 2020-2021	Hajee Mohammad Danesh Science and Technology University	Environmental Science	M.S.	Elemental contamination level in the water, sediment and aquatic species in the Bongshai river and associated risks assessment	Dr. Muhammad Abdullah Al-Mansur, PSO	02.01.2023-01.01.2024
Md.Toha, Session: 2021-2022	Bangladesh University of Professionals	Environmental Science	M.S.	Determination of Trace Metals from Landfill Sites in Dhaka City	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Amina Saleha, Session: 2020-2021	University of Dhaka	Environmental Science	M.S.	Physicochemical and Microbiological Contamination Analysis in Drinking Water of Different Hospitals in Dhaka City	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024

Shova Akter Session: 2022-2023	Khulna University	Environmental Science	M.S.	Heavy metal accumulation in the different soil aggregate fraction through atmospheric deposition	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Ananya Bhuiya, Session: 2020-2021	Noakhali Science and Technology University	Oceanography	M.S.	Method Development and Validation to Analyze Organochlorine Pesticides in Water and Fishes of Pond and River	Dr. Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Bishoonath Paul, Session: 2020-2021	Jagannath University	Pharmacy	M. Pharm.	Antibiotics residue analysis in Poultry Chicken	Dr.Md. Humayun Kabir, SSO	02.01.2023-01.01.2024
Md Shakib Khan, Session: 2021-2022	Noakhali Science and Technology University	Fisheries and Marine Science	M.S.	Trace metal toxicity assessment in available fish and shellfish species from southeastern coast of Bangladesh and their impact on human health	Md. Abu Bakar Siddique , SSO	02.01.2023-01.01.2024
Md. Abu Hasnat, Session: 2019-2020	Begum Rokeya University, Rangpur	Chemistry	M.S.	Assessment of trace elements and multi parameters of water quality in Rangpur city: A case study of Shamasundari canal, Rangpur, Bangladesh	Mehedi Hasan, SO	02.01.2023-01.01.2024
Asef Raj, Session: 2020-2021	University of Dhaka	Pharmacy	M. Pharm.	Phytochemical and biological investigations of leaves of Ceriops decandra (Family: Rhizophoracease)	Dr. Muhammad Abdullah Al-Mansur, PSO	02.01.2023-01.01.2024
Md Rayhanul Islam Rayhan,	Jahanginagar University	Environmental Science	M.S.	Investigation of polychlorinated Biphenyls in Indoor Air of Dhaka, Bangladesh	Dr. Md. Ahedul Akbor,	10.10.2022-09.10.2023
Mr. Md. Mehedi Hasan, Session: 2020-2021	Lincon University College, Malaysia	Chemistry	M.S.	Investigation of thermo-kinetic and thermo chemical conversion and combustion behavior of different indigenous solid wastes for potential energy production.	Dr. Muhammad Abdullah Al-Mansur, PSO	10.10.2022-09.10.2023

Mehreen Farid, Session: 2020-2021	Chattogram veteran ary and Animal Sciences University	Applied Chemistry and Chemical Technology	M.S.	An effective method development to analyse sulfa drugs residue in bovine milk	Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Razia Sultana Ankhy, Session: 2019-2020	University of Dhaka	Chemistry	M.S.	Source apportionment of atmospheric brown carbon by the analysis of the spectral characteristicsandchromophores of brown carbon in the ambient air of Dhaka city, Bangladesh	Dr. Md. Ahedul Akbor, PSO	10.10.2022-09.10.2023
Md. Sohag Hossain, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Synthesis of Reduced Graphene Oxide Based Nanocomposite and its Application in Antibiotic Adsorption from Aqueous Media.	Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Ilnaz Fargul Chowdhury, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Fabrication of Graphene Oxide Based Hydrogel for the Removal of Dyes and Antibiotics from Aqueous Solutions.	Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
NishatTashin, Session: 2020-2021	University of Dhaka	Chemistry	M.S.	Preparation of Graphene Oxide Metal Oxide-Hydrogel Composite for Waste water Treatment.	Dr. Sabina Yasmin, SSO	10.10.2022-09.10.2023
Md. Amran Hossen Suvo, Session: 2020-2021	University of Dhaka	Physics	M.S.	Graphene Oxide (GO) based semiconducting Nanocomposites	Dr. Sabina Yasmin, SSO	10.10.2022-09.10.2023
Ndia Bulbul, Session: 2020-2021	Hajee Mohammad Danesh Science and Technology	Food Science and Nutrition	M.S.	Impact of Abamectin pesticide exposure on tea-leaf metabolome and tea quality: A metabolomics	1.Shamim Ahmed, PSO 2. Dr. Md. Humayun Kabir, SSO	10.10.2022-09.10.2023
Abdur Rouf Azad, Session: 2019-2020	Chittagong University of Engineering And	Chemistry	M.Phill.	-----	Md. Ripaj Uddin, SO	10.10.2022-09.10.2023
Sagor Das, Session: 2019-2020	Jagannath University	Pharmacy	M. Pharm.	Development and Characterization of Artificial Meat	Md. Ripaj Uddin, SO	10.10.2022-09.10.2023

Research Fellow

Research Fellow	University	Supervisor	Research Title
Shaifa Abrarin (05.01.2022)	University of Chittagong, Chittagong	Md. Abu Bakar Siddique, SSO, INARS, Dhaka	Level of some chemical elements in the industrial effluents, soil, and human-edible plant parts near the Gazipur industrial region, Bangladesh
Md.Sanwar Hossain (30.06. 2022)	Jashore University of Science & Technology, Jashore	Dr. Sabina Yasmin, SSO, INARS, Dhaka	Synthesis of Graphene Oxide-Based Nanocomposite and its Applications
Nushrat Jahan Chowdhury (30.06.2022)	Jahangirnagar University, Dhaka	Dr. Md. Ahedul Akbor, PSO, INARS, Dhaka	Investigation, Ecological & Health Risk Assessment of Polychlorinated Biphenyls, Organochlorine Pesticides & Organophosphate Pesticides in the Environmental Matrix of Turag River
Nasrin Akter Bhuiyan (30.06.2022)	Noakhali Science and Technology University, Noakhali	Sharmin Ahmed Trisha, SO, INARS, Dhaka	Determination of Antibiotic Resistance & Relevant Resistance Genes in Isolated Bacteria From Poultry Samples, Bangladesh
Md. Yeasin Pabel (01.03.2023)	University of Dhaka, Dhaka	Dr. Humayun Kabir, SSO, INARS, Dhaka	Graphene-Based Nanocomposites for the Electrochemical Sensing of Trace Level Arsenic in Aqueous Media
Nisat Taslum Jhumur (01.03.2023)	Jahangirnagar University, Dhaka	A.H.M Shofiul Islam Molla Jamal, SSO, INARS, Dhaka	Source Apportionment & Hydro-geochemical Evaluations of Shallow Groundwater & Its Suitability of Drinking & Irrigation Purposes in Kaligonj Upazila of Satkhira District, Southwestern Part of Bangladesh

Degree/award achieve

Dr. Muhammad Abdullah Al Mansur PSO, INARS, Dhaka and Dr. Md. Ahedul Akbor, PSO, INARS, Dhaka awarded with Doctor of Philosophy (PhD).

Strategic Objectives, Activities, Performance indicators and Goals of INARS 2022-2023:

Strategic Objectives	Activities	Performance Indicators	Target 2021-22	Achievement 2021-22	Target 2022-23
1	2	3	4	5	6
1.Increase support for science and technology research	1.1 Research assistance in thesis / report editing	1.1.1 Supervising Thesis / Report	6	7	8
	1.2 Science and technology training	1.2.1 Trained manpower	18	19	20
	1.3 Method validation aimed at increasing the capacity of sample analysis	1.3.1 Validated method	5	6	7
2.Popularization of science and technology	2.1 Organizing seminars and workshops on science	2.1.1 Organized seminars and workshops	12	13	14
	2.2 Learning sessions on current issues	2.2.1 Learning sessions on current issues	0	0	1
3. Innovation of eco-friendly and sustainable technology for socio-economic development	3.1 Implementation of projects adopted for innovation and development of science, industry and technology	3.1.1 Ongoing and completed R&D project	5	6	7
	3.2 Informing stakeholders of research results	3.2.1 Proverbs and books published in scientific journals	6	10	11
		3.2.2 Organized seminars and workshops	1	1	1
	3.3 Transferable technology invented for industrial and commercial use	3.3.1 Process	1	1	1
		3.3.2 Patents	1	1	1
	3.4 Technology / Procedure Leasing and signing of Memorandum of Understanding (MoU)	3.4.1 Lease granted and Memorandum of Understanding signed	1	1	1
	3.5 Identification and solution of technical problems by inspecting industrial establishments	3.5.1 Inspection of industrial establishments and solution of identified problems	2	4	5
	3.6 Provide sample analysis and technical services	3.6.1 Analysis Services provided	1100	1130	1200

ANNUAL REPORT
2022-2023
(Analytical Facilities)
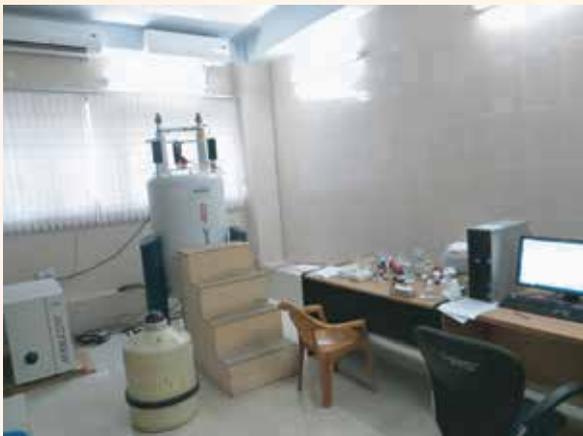
Nuclear Magnetic Resonance Spectrometer

Gas Chromatograph

Gas Chromatograph -Mass Spectrometer

High Performance Liquid Chromatograph

Prep. High Performance Liquid Chromatograph

Atomic Absorption Spectrometer

Ion Chromatograph

UV-Visible Spectrometer

Total Organic Carbon Analyzer

Elemental Analyzer

Fourier Transform Infrared Spectrometer (FT-IR)

Auto Analyzer

Sample Matrix

Arsenic Filter Verification

Chemical Raw Materials
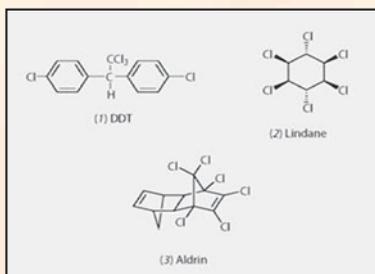
Coal, Oil and Petroleum Products

Drinking Water/Ground Water/Surface Water/Industrial Water/Waste Water

Drinks/Beverage

Feed, Fish, Vegetables

Synthetic Compounds

Soil and Minerals

Hand Sanitizer

1. Arsenic (As)	2. Phosphate (PO_4^{2-})/P	3. Fluoride (F-)	4. Chloride (Cl^-)
5. Nitrite (NO_2^-)	6. Bromide (B^-)	7. Nitrate (NO_3^-)	8. Sulphate (SO_4^{2-})
9. Iron (Fe)	10. Conductivity	11. Manganese (Mn)	12. pH
13. Total Dissolved Solids (TDS)	14. Hardness	15. Copper (Cu)	16. Zinc (Zn)
17. Sodium (Na)	18. Potassium (P)	19. Alkalinity	20. Oil & Grease
21. Aluminium (Al))	22. Cobalt (Co)	23. Nickel (Ni)	24. Lead (Pb)
25. Cadmium (Cd)	26. Chromium (Cr)	27. Calcium (Ca)	28. Magnesium (Mg)
29. Mercury (Hg)	30. Total Organic Carbons (TOC)	31. Phenolic Compounds	32. Acidity
33. Total Solids (TS)	34. Total Suspended Solids (TSS)	35. Turbidity	36. Ammonia (NH_3)
37. Chemical Oxygen Demand (COD)	38. Biological Oxygen Demand (BOD)	39. Salinity	40. Aldrin (Pesticides)
41. Alpha-BHC (Pesticides)	42. Beta-BHC (Pesticides)	43. Delta-BHC (Pesticides)	44. Gamma-BHC (Pesticides)
45. Alpha Chlordane (Pesticides)	46. Gamma Chlordane (Pesticides)	47. 4,4' -DDD (Pesticides)	48. 4,4' -DDE (Pesticides)
49. 4,4' -DDT (Pesticides)	50. Dieldrin (Pesticides)	51. Endrin (Pesticides)	52. Endrin aldehyde (Pesticides)
53. Endrin ketone (Pesticides)	54. Endosulfan I (Pesticides)	55. Endosulfan II (Pesticides)	56. Endosulfan sulphate(Pesticides)
57. Heptachlor (Pesticides)	58. Heptachlor Epoxide (Pesticides)	59. Methoxychlor (Pesticides)	60. Acenapthene (PAH)
61. Acenaphtylene (PAH)	62. Anthracene (PAH)	63. Benzo (a) anthracene (PAH)	64. Benzo (a) pyrene (PAH)
65. Benzo (k) fluoranthene (PAH)	66. Benzo (g,h,i) perylene (PAH)	67. Benzo (b) fluoranthene (PAH)	68. Chrysene (PAH)
69. Dibenze (a,h) anthracene (PAH)	70. Fluoranthene (PAH)	71. Fluorene (PAH)	72. Indeno (1,2,3-cd) pyrene (PAH)
73. Phenanthrene (PAH)	74. Pyrene (PAH)	75. Carbonate (HCO_3^-) hardness by Titration Method	76. Non-carbonate Hardness
77. Negative Hardness	78. Carbon di-oxide (CO_2)	79. Carbonate by Titration Method	80. Bi carbonate (HCO_3^-) by Titration Method
81. Chlorine (Cl_2)	82. Elemental Analysis- Carbon (%C)	83. Elemental Analysis- Hydrogen (%H)	84. Elemental Analysis- Nitrogen (%N)
85. Elemental Analysis- Sulphur (%S)	86. Total Nitrogen	87. Color	88. Odour

Other Analytical parameter

Additives	Selenium (Se)
Adulterants	Silica (SiO2)
Antimony (Sb)	Silicon (Si)
Appearance	Silver (Ag)
Barium (Ba)	Solvent Residue
Boron (B)	Strontium (Sr)
Cytotoxicity	Temperature
Dissolved Oxygen	Taste
Elemental Analysis-Oxygen (%O)	Tin (Sn)
Gold (Au)	Vanadium (V)
Pesticides residue	Volatile Organic Compounds (VOC)
Poly Chlorinated Biphenyls (PCB)	Total Coliform
Persistent Organic Pollutants (POPs)	Total Plate Count
Purity (Organic Solvent)	*E. Coli*
Molybdenum (Mo)	

For analytical service, please visit us at http://bcsir.eserve.org.bd/users/login or contact us at the following address:
Analytical Service Cell (ASC)
Dr. Qudrat-I-Khuda Road, Dhanmondi, Dhaka-1205, Bangladesh.
Telephone: + 88 02 9671108, Fax: +88 02 9671108, E-mail. asc@bcsir.gob.bd

List of Employees of INARS

List of Scientists

Sl No.	Name	Designation	Field of Specialization	E-mail	Phone
1.	Sarker Kamruzzaman Director (Addl. Charge)	Cheif Scientific Officer	Chemical Engineering	tuhin940@yahoo.com	01755944973
2.	Shamim Ahmed	Principal scientific Officer	Analytical, Environmental & Natural Product Chemistry, ISO 17025:2005 accreditation	shamimchem@yahoo.com shamiminars@bcsir.gov.bd	01959906726
3.	Dr. Muhammad Abdullah Al-Mansur	Principal scientific Officer	Analytical, Environmental & Natural Product Chemistry, ISO 17025:2005 accreditation	nayeembcsir@gmail.com	01715010829
4.	Shakila Akter	Principal scientific Officer	Analytical, Environmental & Natural Product Chemistry, ISO 17025:2005 accreditation	shakilabcsir@yahoo.com	01913382006
5.	Dr.Md. Ahedul Akbor	Senior scientific Officer	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	akborbcsir@yahoo.com	01816188859
6.	Dr. Md. Humayun Kabir	Senior scientific Officer	Analytical & Environmental Chemistry,	h.kabir79@yahoo.com	01906750461
7.	Dr. Sabina Yasmin	Senior scientific Officer	Analytical Chemistry, ISO 17025:2005 accreditation	sabinausha@yahoo.com	01908468186
8.	Md. Abu Bakar Siddique	Senior scientific Officer	Inorganic, Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	sagor.bcsir@gmail.com	01723454310
9.	AHM Shofiul Islam Molla Jamal	Senior scientific Officer	Analytical & Environmental Chemistry, ISO 17025:2005 accreditation	shofiuljamal@yahoo.com	01717258753
10.	Aynun Nahar	Scientific Officer	Applied Chemistry & Chemical engineering	aynunacce@gmail.com	01754220089
11.	Rokaia Sultana	Scientific Officer	Microbiology	rokaiasultana@rocketmail.com	01515288830
12.	Tajnin Jahan	Scientific Officer	Organic Chemistry	tajninjahan03@gmail.com	01929412262
13.	Shahnaz Sultana	Scientific Officer	Microbiology	shahnazsultana339@gmail.com	01521569814
14.	Mehedi Hasan	Scientific Officer	Organic Chemistry	hasan.mehedi013@gmail.com	01750952484
15.	Sharmin Ahmed Trisha	Scientific Officer	Microbiology	sharmin.du.93@gmail.com	01538195452
16.	Md.Atikur Rahman	Scientific Officer	Organic Chemistry	atik243246@gmail.com	01721205542
17.	Rashed Mahmud	Research Physicist		rashedmahmud1971@gmail.com	01711212067

Technical Personnel in Laboratory

Sl. No.	Name	Designation	E-mail	Phone
1.	Md. Khandaker Parvez Ahammed	Technician	parvez.bcsir@gmail.com	01747855599
2.	Md. Saleh Ahmed	Technician	salehahamed.bcsir@yahoo.com	01758808327
3.	Md. Nurul Islam	Technician		01726101456
4.	Md. Jahangir Alam	Jr. Technician	Jahangirbcsir8888@gmail.com	01722930929
5.	Shah Jalal Sharkar,	Jr. Technician		01762678958
6.	Ahmed Ali Islam	Technician		01718635031
7	MD. Jomir Ali	Sr. Lab Attendant		01920003495
8.	Moin Uddin	Sr. Lab Attendant	moininarsbcsir2017@gmail.com	01910433143
9.	Md. Sipar Miah	Lab Attendant	Kazi_shiper_ahmed@live.com	01716679075
10.	Md. Hanif Miah	Lab Attendant		01918969265

Personnel in Administration Section

Sl. No.	Name	Designation	E-mail	Phone
1.	Sheikh Md. Wazed Ali	Assistant Administrative Officer (Addl. Charge)	alimdsikender@gmail.com	01817590675
2.	Md. Woaz Kazi	LDA	Mkwoaz_1994@gmail.com	01688376427
3.	Shamima Akter	Office assistant	Shamima.0162@gmail.com	01623283092
4.	Md. Amir Hossen	MLSS	Amirtapon4898@gmail.com	01872647972
6.	Dithi Rani Dhoom	Cleaner		

Personnel in Accounce section

Sl. No.	Name	Designation	E-mail	Phone
1.	Sheikh Md. Wazed Ali	Assistant Accounts Officer (Addl. Charge)	alimdsikender@gmail.com	01817590675
2.	Rokhsana Akhter	UDA	Akterrokhsanan47@gmaiol.com	01675213957
3.	Nasima Begum	Junior Technician		01726779710

Committees of INARS 2022-23

Tender opening committee:

Sl. No.	Name	
1.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Convener
2.	Umme Sharmin Akter, SSO, IGCRT, BCSIR, Dhaka.	Member
3.	Dr. Sabina Yasmin, SSO, INARS, BCSIR, Dhaka.	Member Secretary

Request for Quotation (RFQ) Process and direct purchase committee:

Sl. No.	Name	
1.	Dr. Sabina Yasmin, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Mosharoff Hossain, PSO, IFRD, BCSIR, Dhaka.	Member
3.	Sheikh Md. Wazed Ali, Accounts Officer (Addl-charge), INARS, BCSIR, Dhaka	Member Secretary

Tender evaluation committee:

Sl. No.	Name	
1.	Shamim Ahmed, Ex-Director, INARS, BCSIR, Dhaka.	Convener
2.	Dr. Enamul Hoque, Associate Professor, Department of Chemistry, University of Dhaka.	Member
3.	Sharmin Nishat, Lecturer, Department of Chemistry, BUET, Dhaka	Member
4.	Md. Mahbub Hasan Khan, Director, BCSIR, Dhaka	Member
5.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka	Member
6.	Dr. Sabina Yasmin, SSO, INARS, BCSIR, Dhaka	Member
7.	Sheikh Md. Wazed Ali, Accounts Officer (Addl-charge), INARS, BCSIR, Dhaka.	Member Secretary

Technical Sub-Committtee:

Sl. No.	Name	
1.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Dr. Md. Monarul Islam, SSO, Dhaka lab, BCSIR, Dhaka.	Member
3.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka. Aynun Nahar, SO, INARS, BCSIR, Dhaka.	Member Secretary

Technical Specification Committtee:

Sl. No.	Name	
1.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka.	Convener
2.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Member
3.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka	Member
4.	Aynun Nahar, SO, INARS, BCSIR, Dhaka	Member Secretary

Verification Committee (Apparatus and Chemicals):

Sl. No.	Name	
1.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Mohammad Moniruzzaman, PSO, BCSIR Laboratory, Dhaka.	Member
3.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka.	Member Secretary

Repair Committee

Sl. No.	Name	
1.	Md. Abu Bakar Siddique, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Sadequl Islam, ME, BCSIR, Dhaka.	Member
3.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka.	Member
4.	Dr. Sabina Yasmin, SSO, INARS, BCSIR, Dhaka.	Member Secretary

Research & Development (R&D) Monitoring

Sl. No.	Name	
1.	Shamim Ahmed, Ex- Director (addl. Charge), INARS, BCSIR, Dhaka.	Convener
2.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka.	Member
3.	Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Member Secretary

Integrity and Ethics Committee:

Sl. No.	Name	
1.	Shamim Ahmed, ex-Director (addl. Charge), INARS, BCSIR, Dhaka.	Convener
2.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Member
3.	Dr. Md. Ahedul Akbor, PSO, INARS, BCSIR, Dhaka	Member
4.	Md. Abu Bakar Siddique, SSO, INARS, BCSIR, Dhaka.	Member
5.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Member Secretary

Innovation Committee:

Sl. No.	Name	
1.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Tajnin Jahan, SO, INARS, BCSIR, Dhaka.	Member
3.	Md. Ripaj Uddin, SO, INARS, BCSIR, Dhaka.	Member Secretary

Service Provide and Implementation Committee:

Sl. No.	Name	
1.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Convener
2.	Md. Ripaj Uddin, SO, INARS, BCSIR, Dhaka.	Member Secretary

GRS Committee:

Sl. No.	Name	
1.	Shamim Ahmed, PSO, INARS, BCSIR, Dhaka.	Appeal Officer
2.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka	Grievance Mitigation Officer

Information right Committee:

Sl. No.	Name	
1.	Dr. Md. Ahedul Akbar, PSO, INARS, BCSIR, Dhaka.	Convener
2.	Shahnaz Sultana, SO, INARS, BCSIR, Dhaka.	Member Secretary

Annual Progress Report

Sl. No.	Name	
1.	Shamim Ahmed, Director, INARS, BCSIR, Dhaka.	Team Leader
2.	Dr. Muhammad Abdullah Al-Mansur, PSO, INARS, BCSIR, Dhaka.	Convener
3.	Dr. Md. Ahedul Akbar, PSO, INARS, BCSIR, Dhaka.	Member
4.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka.	Member
5.	Md. Ripaj Uddin, SO, INARS, BCSIR, Dhaka.	Member
6.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Focal point

Web-site Update Committee:

Sl. No.	Name	
1.	Md. Ripaj Uddin, SO, INARS, BCSIR, Dhaka.	Convener
2.	Mehedi Hasan, SO, INARS, BCSIR, Dhaka.	Member
3.	Shahnaz Sultana, SO, INARS, BCSIR, Dhaka.	Member Secretary

4th Revolution Challenge Progress Report Committee:

Sl. No.	Name	
1.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka	Convener
2.	Tajnin Jahan, SO, INARS, BCSIR, Dhaka.	Member Secretary

Monthly Coordinated Program Progress Report Committee:

Sl. No.	Name	
1.	Dr. Md. Humayun Kabir, SSO, INARS, BCSIR, Dhaka	Convener
2.	Shahnaz Sultana, SO, INARS, BCSIR, Dhaka.	Member Secretary

ISO Implementation Committee:

Sl. No.	Name	
1.	Dr. Md. Ahedul Akbar, PSO, INARS, BCSIR, Dhaka.	Convener
2.	AHM Shofiul Islam Molla Jamal, SSO, INARS, BCSIR, Dhaka.	Member Secretary

Photo Gallery

Group Activities of INARS

Stakeholder meeting

APA signing programme

Farewell ceremony

Presentation delivery in stakeholder meeting

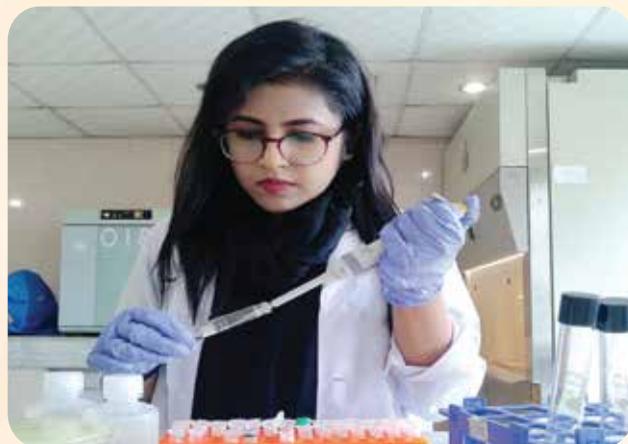Stakeholder meeting

ISO activities

Scientists were working in AAS room

Scientists were working in wet lab

Scientsist were working in IC room

Microbiologist was working in microbiological lab

Scientist were working in UV instrument

Cleaning and washing glassware

BCSIR-BNACWC training programme

In-house training on GC-MS

In-house training on Conductivity

In-house training on IC

Monthly coordination meeting

R&D presentation

BCSIR Stoll of Ekushe Boi mela

Directorship charge handover

BCSIR Stoll of Ekushe Boi mela

Official kits giving ceremony

Lagshoi seminar

Presentation delivery in lagshoi seminar

Conference award giving ceremony

Semiar of P&D

Conference certificate ceremony

Conference certificate ceremony

Lab visit of School student

Lab visit of School student

Suddachar prize award

Best presenter award

Group discussion in ISO room

Analytical report preparation

Administration division

Administration division

Institute of National Analytical Research and Service (INARS)
Bangladesh Council of Scientific & Industrial Research (BCSIR)

Dr. Qudarat -i-khuda Road, Dhanmondi
Dhaka-1205, Bangladesh
Email: dir-inars@bcsir.gov.bd
Tel: +88 02 9664959, Fax: +88 02 58611767
Web: http://inars.bcsir.gov.bd, www.bcsir.gov.bd