

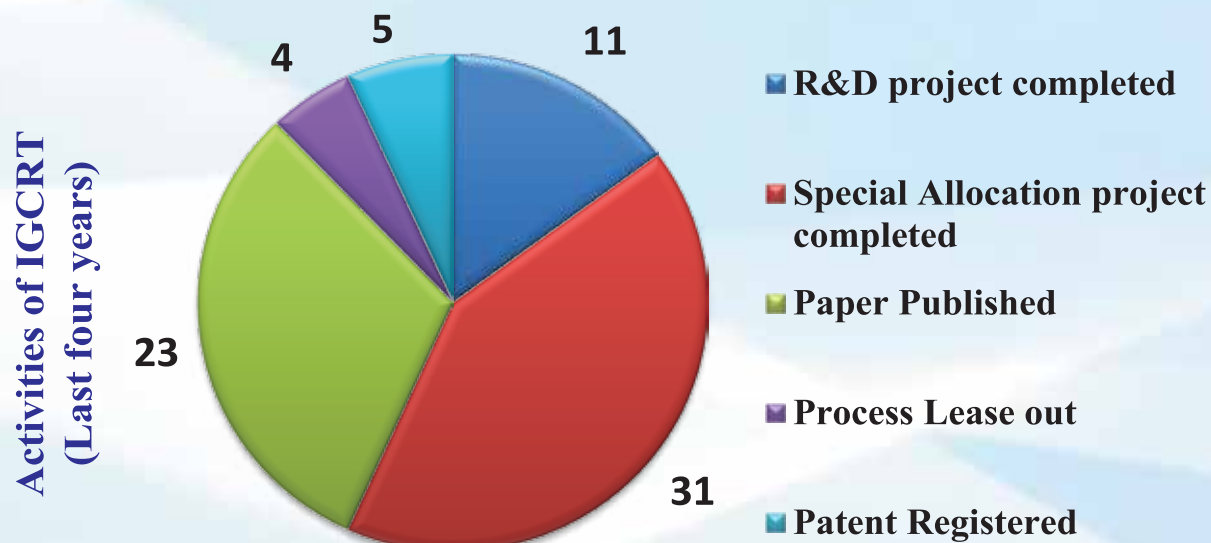
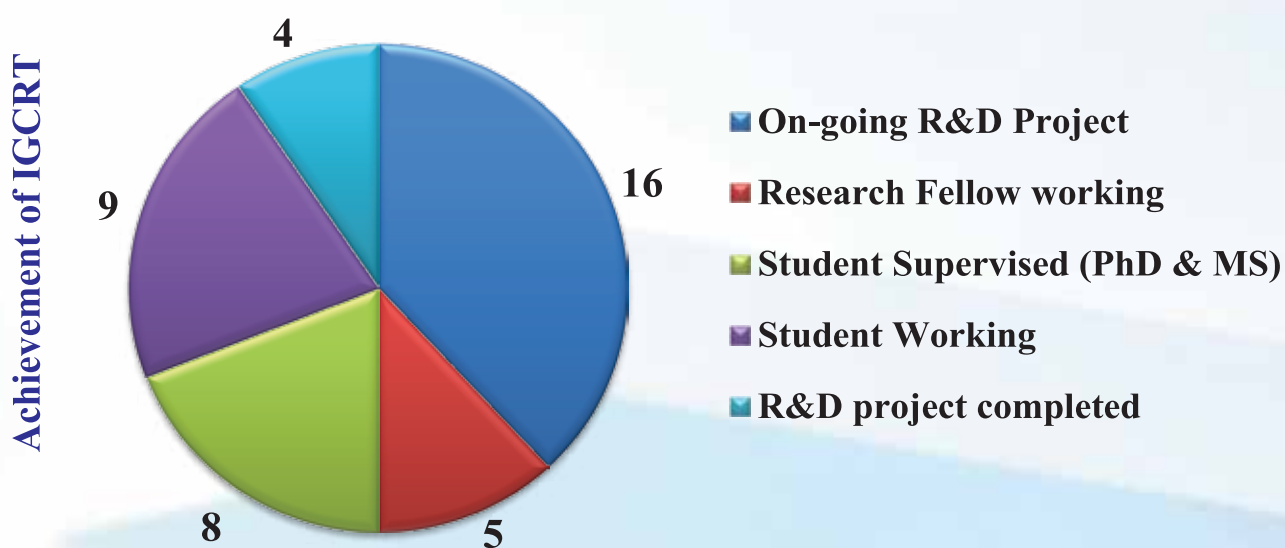
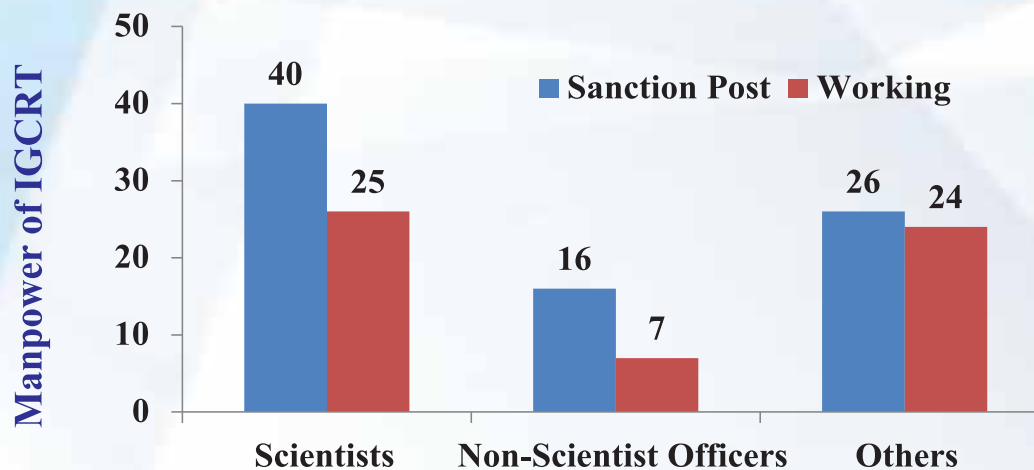


20th Annual Report 2021-2022 IGCRT

Institute of Glass and Ceramic Research and Testing (IGCRT)
Bangladesh Council of Scientific and Industrial Research (BCSIR)

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IGCRT AT A GLANCE



20th

Annual Report 2021-2022





Messages



MESSAGE FROM THE CHAIRMAN OF BCSIR

It is an immense pleasure to know that the Glass and Ceramic Research and Testing Institute (IGCRT), Bangladesh Council of Scientific and Industrial Research (BCSIR) is going to publish Annual Report for the year 2021-2022 like every year. This report intends to unfold the yearly research and development activities, achievements as well as full institutional information. I am overwhelmed to learn about the outstanding contribution of scientists in research especially in the field of industrial application during Mujib Year.

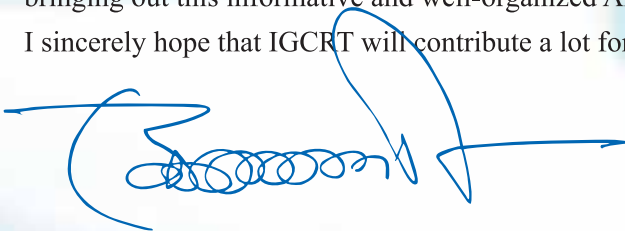
IGCRT started its journey as one of the mono-disciplinary research institutes of BCSIR on October, 2001 and carried out R&D projects to investigate glass and ceramic materials in Bangladesh. The magnificent journey of IGCRT continues from the very beginning and its achievements, particularly, in the field of R&D has always been rated excellent. This institute is not just confined in conducting research activities but also offer analytical services to various organizations, entrepreneurs and stake holders especially who are dealing with the export-import businesses. In addition, scientists of IGCRT supervise students of MS, M.Phil and PhD from different universities for their higher degrees and help them to move towards innovation through their knowledge and skills.

I also like to add that an important milestone, Memorandum of Understanding (MoU) between Council of Scientific and Industrial Research (CSIR) of India and Bangladesh Council of Scientific and Industrial Research (BCSIR) of Bangladesh was signed on 6th September 2022 in the presence of Honorable Prime Minister's of India and Bangladesh to establish a broad framework to promote scientific and technological cooperation. I am very truly optimistic that this attempt will help our institution to extend its research horizon to greater extend. I am indebted to express my heartfelt gratitude to the Honorable Prime Minister of the Govt. of the People's Republic of Bangladesh, Sheikh Hasina for her generous support to the enrichment of BCSIR by providing scientific facilities.

I am also grateful to Honourable Minister Architect Yeafesh Osman of Ministry of Science and Teghnology for his continuous support. I am thankful to Senior Sectarary of Ministry of Science and Technology Mr. Ziaul Hasan nde for his generous support in all aspects.

I would like to conduct my heartfelt appraisal to the director, scientists and all working forces of IGCRT for their venture and dedication in establishing this institute as one of the excellent research unit of BCSIR and the country as well. I specially convey my thanks to the publication team for their performance in bringing out this informative and well-organized Annual Report.

I sincerely hope that IGCRT will contribute a lot for accelerating and strengthening the R&D sector of BCSIR.



Professor Dr. Md. Aftab Ali Shaikh
Chairman, BCSIR



MESSAGE FROM THE DIRECTOR (ADDITIONAL CHARGE)

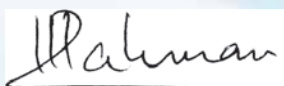
It is my pleased privilege to convey a few words for the “Annual Report 2021-22” of the Institute of Glass and Ceramic Research and Testing (IGCRT).

IGCRT has initiated functioning to support the nation under the banner of the Bangladesh Council of Scientific and Industrial Research (BCSIR) in 2002-2003 in the field of development of Glass, Ceramic and other connected material research. Now-a-days ceramic is not only measured as tableware but also as a material for art ware, sanitary wares and also for building materials. Not only that this institute works in developing the fields of glass, cement, composite cement, refractory, pigments, tiles, pottery porcelain etc., and also supervise the graduate students from the universities. Actually I am very delighted with research performance of my fellow scientists, technologist and also my staff members as they are persistent during their effort filled with the national interest and enhancing the face of BCSIR in country and world. I am satisfied to work with the members of the institute due to their accurately documentation almost all their studies, findings in the field of research & development deeds in appropriate custom.

I hope that the subjects and smartness of the demonstration of this report will be able to bring new approach, inspiration and courage to the scientists to commence new research projects on their applicable field of research.

I would like to express my earnest gratefulness to Professor Dr. Md. Aftab Ali Shaikh, Chairman, BCSIR for his motivation and direction to all scientists, which assisted tremendously to make this report

I would like to thank members of the editorial board and the scientists for their sincere collaboration and constant labors to bring out the report. I also thank the officers and staff members of this institute for their deepest support in this regard.



(Mohammad Habibur Rahman Bhyuia)

Director (Additional-Charge)

IGCRT, BCSIR, Dhaka.

MESSAGE FROM THE ADVISOR



(Dr. Shirin Akter Jahan)
PSO and Advisor
Annual Report Committee

It is a boundless pleasure for me to catch a chance to be the consultant of the Annual Report publication committee for the year 2021-22 for compiling all events of IGCRT, BCSIR, Dhaka. This report discloses overall R&D activities comprising the attainments: process development, publication, patent accepted, seminars and symposia attended and organized etc. Apart from these, student supervision of graduate, M. Phill, Ph.D. degrees, training courses availed and other activities by our scientists during the year and also technical support being provided to the industries are documented in this report.

I would like to express my truthful gratitude to Professor Dr. Md. Aftab Ali Shaikh, Chairman, BCSIR, for his stimulation and direction to all scientists, which facilitated immensely not only to the research conduct but also to prepare the report.

I am highly grateful to Mohammad Habibur Rahman Bhyuia, Director (Addl.-Charge), IGCRT, BCSIR, for his inspiration and positive suggestions while compiling this report.

I would like to express my heartfelt thanks to all members of the publication committee for their heartfelt struggles and assistance in compiling and publishing the report in time.

I owe a great to all scientists, officers, technicians and staffs of IGCRT for their spontaneous responses while organizing this report.

I am optimistic about that this report will support scientists, research fellows, entrepreneurs to have a rapid preview into overall accomplishments. Our humble but proud achievements over this short period have ascertained our strength and potential. And I sincerely trust that the institute has the potential to produce much more and the best is yet to come.

MESSAGE FROM THE CONVENOR



U Sarmeen

(Dr. Umme Sarmeen Akhtar)
SSO and Convenor
Annual Report Committee

It is a great pleasure for me to get an occasion to be the convener of the 19th Annual Report publication committee for the year 2021-22 for publishing all activities of IGCRT, BCSIR, Dhaka. This report divulges overall R&D accomplishments counting the achievements: publication, patent accepted, seminars, process development, and symposia appeared and organized etc.

I would like to express my sincere thankfulness to Professor Dr. Md. Aftab Ali Shaikh, Chairman, BCSIR, and Mohammad Habibur Rahman Bhyuia, Director (Addl.-Charge), IGCRT, BCSIR, Dr. Shirin Akter Jahan, PSO and Advisor, Annual Report Committee for their encouragement and guidance to all scientists, which aided tremendously to make the report.

I would like to express my heartfelt thanks to all members and member secretary of the publication committee for their frank hard work and assistance in compiling and publishing the report in time.

Our humble but honored successes over this small period have shown our strength and potential. And I honestly trust that the institute has the latent to yield much more and the best is yet to originate.

I owe a great to all scientists, officers, technicians and staffs of IGCRT for their spontaneous responses while organizing this report.

I hope that the subjects and style of this report will benefit to commence new research plans on their appropriate research field.

MESSAGE FROM THE MEMBER SECRETARY



(Bristy Biswas)
SO and Member Secretary
Annual Report Committee

It is my gigantic pleasure to acquire an occasion to be the Member secretary of the Annual Report publication committee for publishing all activities of IGCRT, BCSIR, Dhaka in the year 2021-22. This report exposes overall R&D activities including the achievements: publication, patent accepted, seminars, process development, and symposia attended and organized etc.

I hope that the contents and style of the presentation of this report will be able to bring new attitude, inspiration and courage to the scientists to undertake new research projects on their relevant field research.

I would like to express my sincere gratitude to Professor Dr. Md. Aftab Ali Shaikh, Chairman, BCSIR, Mohammad Habibur Rahman Bhyuia, Director (In-Charge), IGCRT, BCSIR, Dr. Shirin Akter Jahan, PSO and Advisor, Annual Report Committee, Dr. Umme Sarmeen Akhtar, SSO and convener, Annual Report Committee, for their inspiration and guidance to all scientists, which facilitated tremendously to organize the report.

I am also pleased and satisfied with the members of annual report committee for their relentless efforts and cooperation during this report preparation. I would like to thank members of the editorial board and the scientists, and all staff of IGCRT for their sincere cooperation to publish the report.

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Some Salient Features of IGCRT

Vision & Mission of IGCRT

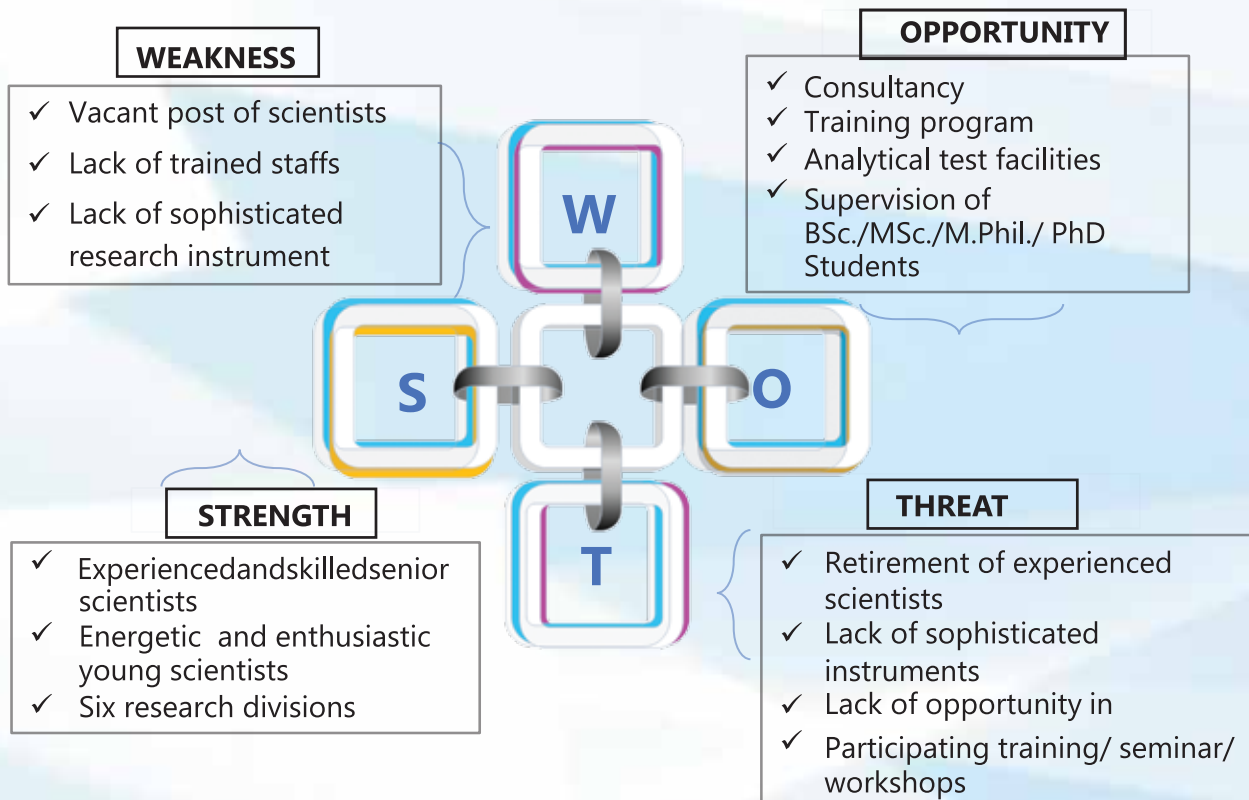
VISION

To achieve the status of a center of Excellence by the year 2021 for market driven scientific, industrial and technological research and innovation in glass and ceramics technology

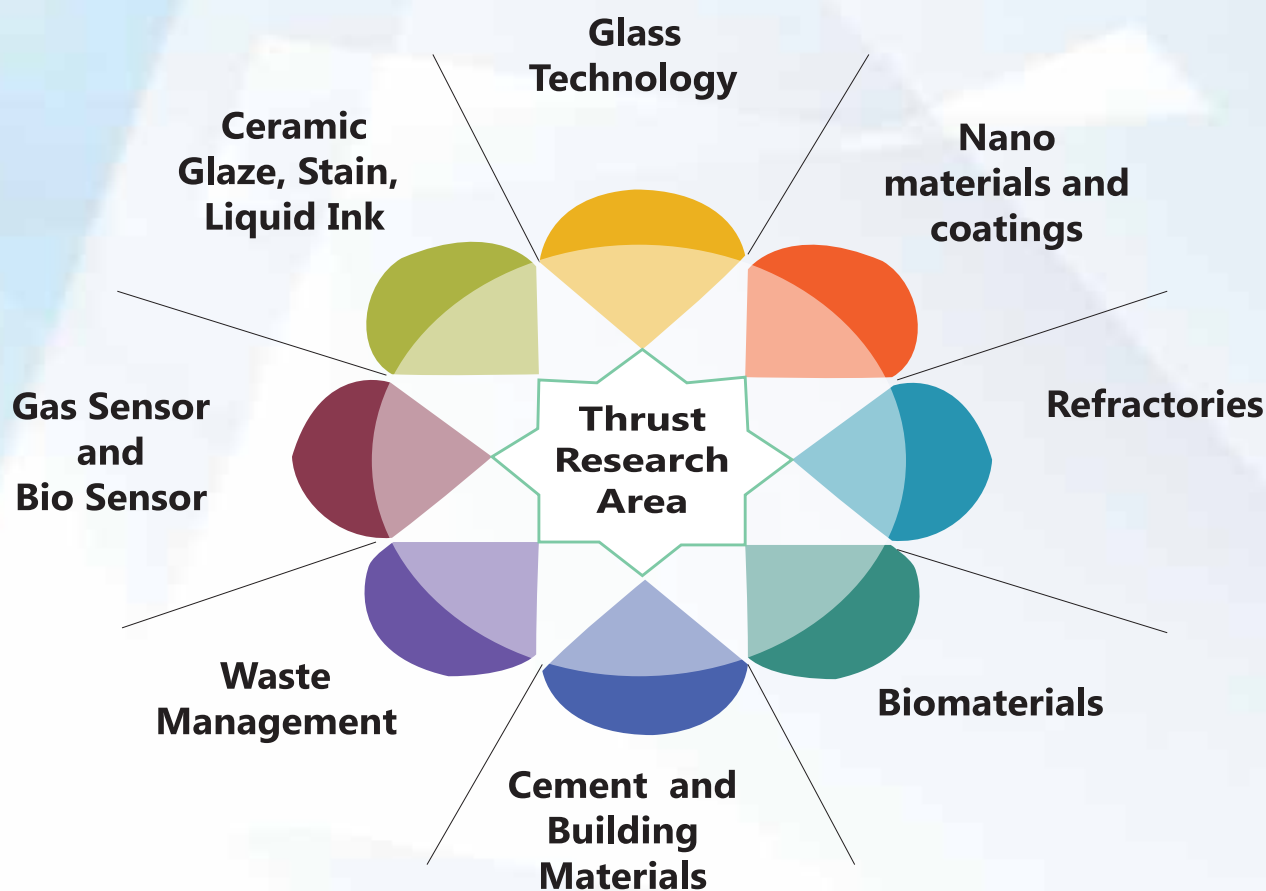
MISSION

To carry out, promote and guide scientific, industrial and technological research focusing glass, ceramics, and economic, environmental and societal benefits for the people of Bangladesh

SWOT analysis of IGCRT



Thrust Research Area



Stake Holders



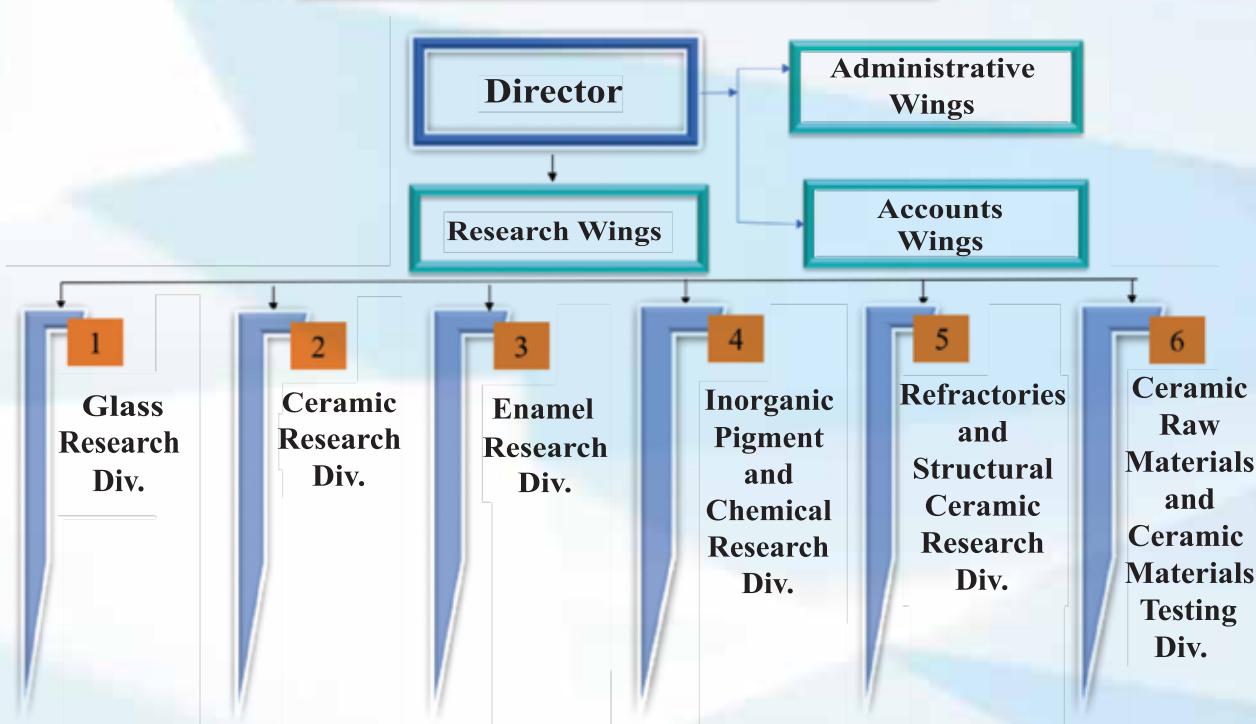
Preface

“Institute of Glass and Ceramic Research and Testing (IGCRT)” is the 4th mono disciplinary unit of BCSIR, emerged as institute in the year 2001 through the up-gradation of the “Division of Glass and Ceramic Technology” of BCSIR Laboratories Dhaka which was functional since 1955. The institute is a premier R&D organization dedicated to harnessing S%T capabilities in the field of glass, ceramics and allied materials for the strategic needs and also for the industrial and economic development of the country. Glass and ceramics and allied materials are increasingly becoming the materials of choice in the emerging technological scenario and the institute has been playing a significant role in these developments. IGCRT is poised to take on the challenge of the new millennium with the development of several new products and processes for future requirement.

Objectives

- To carry out R&D program in the field of glass, ceramic, refractories, building materials, inorganic pigment as well as on traditional ceramics
- To develop import substituted ceramic materials from locally available indigenous sources
- To undertake projects promoting environmentally sound technology
- To produce value added ceramic products through recycling of various industrial waste/by-products
- To develop market driven product
- To test of various raw materials as well as finished products
- To conduct training programs

Institutional Structure



Our Pride Moment



Celebration of National Days



Victory Day
16th December
2021

Independence Day
26th March,
2022



International Mother
Language Day
21st February
2022

Ceramic Research Division

- ❖ Removal of toxic elements from textile effluent by using ceramic based adsorbent

Ceramic Raw Materials and Ceramic Materials Testing Division

- ❖ Synthesis, Characterization and Functionalization of Nano Cobalt Ferrite (CoFe_2O_4)
- ❖ Development of ceramic based Nano spinel materials for humidity sensor
- ❖ Development of liquid ink (Blue, Magenta, Yellow & Black) for ceramic industries

Enamel Research Division

- ❖ Development of nano crystallized glass using coal ash
- ❖ Extraction of alumina (Al_2O_3) from coal fly ash (CFA) generated from coal based thermal power plants in Bangladesh

Glass Research Division

- ❖ Development of bioceramic polymer composite reinforced with graphene for treatment of tannery effluent
- ❖ Synthesis of calcium based compound from natural source for industrial application
- ❖ Synthesis of nano crystallite biomaterial and natural polymer based composite for treatment of textile effluent
- ❖ Application of hydroxyapatite for controlled drug delivery

Ongoing R&D Projects

Refractory and Structural Ceramic Research Division

- ❖ Production of silica refractory brick from river sand
- ❖ Production of Zeolite based composite material for Carbon-di-Oxide Scavenger
- ❖ Development of Expanding agent for bricks and aggregates
- ❖ Improvement of a process for commercial admixture used for concrete and cement industries
- ❖ Development of Geopolymer concrete blocks from locally available solid wastes
- ❖ Application of Response surface methodology for the Optimization of mix designed concrete using locally available materials



Ceramic Research Division

Removal of toxic elements from textile effluent by using ceramic based adsorbent

Associates:

Nigar Sultana Pinky, SO, PL
Dr. Sonjida Mustafi, PSO
Rexona Khanom, SSO

Duration:

July 2021-June 2023

Budget: 4.0 Lac

Objective:

- ❖ To develop a ceramic based adsorbent for the removal of toxic elements from textile industry effluent

Socio-economic importance:

- ❖ There is projection on water supply scarcity in near future. The main problem caused by water pollution is that it destroys aquatic ecosystem, cause serious health problem to human being as well as disrupts the natural food chain
- ❖ So it is our prime concern to treat the waste water before discharging to protect the aquatic ecosystem as well as to achieve sustainable development goal 6

Ceramic Raw Materials and Ceramic Materials Testing Division

Synthesis, Characterization and Functionalization of Nano Cobalt Ferrite (CoFe_2O_4)

Associates:

Md. Farid Ahmed, SO, PL
Nahid Sharmin, CSO & Director (Addl. Charge), PP&PDC
Md. Lutfor Rahman, SSO
Dr. Md. Murshed Hasan Sarker, SSO, BCSIR Labs. Rajshahi
Bristy Biswas, SO

Duration:

July 2019 - June 2023

Budget: 9.0 Lac

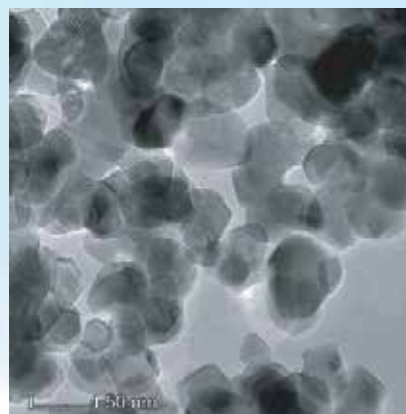
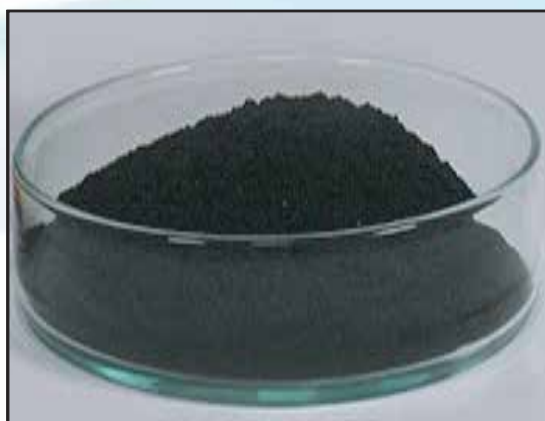
Objective:

- ❖ Synthesis of nano Cobalt Ferrite (CoFe_2O_4)
- ❖ Characterization of the synthesized nano particles
- ❖ Functionalization of nano Cobalt Ferrite (CoFe_2O_4)

Socio-economic importance:

- ❖ Cobalt ferrite magnetic nanoparticles (MNPs) are used as promising nano agent in magnetic separation, biosensors, targeted drug delivery, advanced magnetic resonance imaging (MRI), magnetic hyperthermia (MHT), immunoassay, tissue engineering, and cell separation technique
- ❖ Composite materials consisting of this MNP along with other nanomaterials such as metals, ceramics, polymers, etc. have also been reported with a focus on improving their biocompatibility, preventing aggregation and to impart multifunctional abilities.

Progress: Cobalt Ferrite (CoFe_2O_4) has been synthesized by following sol-gel method and product characterization is going on.



Synthesized cobalt ferrite (CoFe_2O_4)

Development of ceramic based Nano spinel materials for humidity sensor

Associates:

Md. Lutfur Rahman, SSO, PL
Bristy Biswas, SO
Md. Farid Ahmed, SO
Nahid Sharmin, CSO & Director (Addl. Charge), PP&PDC

Duration:

July 2019 - June 2023

Budget: 9.0 Lac

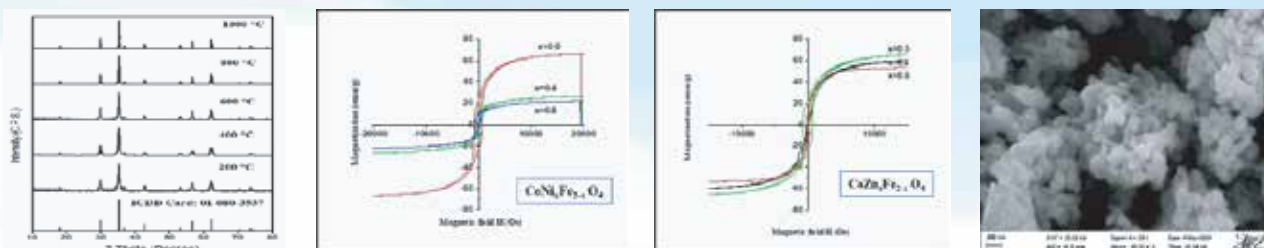
Objective:

- ❖ Synthesis of nano spinel materials
- ❖ Characterization of the synthesized products
- ❖ Measurements of electro-magnetic properties of the synthesized materials
- ❖ Measurement of humidity sensing properties for the selection of
- ❖ Fabrication of humidity sensor for industrial applications

Socio-economic importance:

- ❖ Spinel nano materials have promising applications such as high-density data storage, catalysts, gas sensors, rechargeable lithium batteries, information storage systems, magnetic bulk cores, magnetic fluids, and medical diagnostics and therapy etc
- ❖ A large number of metal oxides, mixed metal oxides and ferrites have shown better sensitivity to certain gas and humidity
- ❖ The desirable characteristics of humidity sensors are high sensitivity, good chemical and thermal stability and short response time
- ❖ The measurement of humidity has received great attention due to the recognized importance of water vapor concentration in many areas, such as meteorology, medicine, agriculture, various industries like tea processing industry, tiles industry, and transformer

Progress: Mg^{2+} , Co^{2+} , Cu^{2+} & Zn^{2+} Ferrites have been synthesized using different methods. MgFe_2O_4 doping with Ti and Zn, CuFe_2O_4 doping with Ce, Co & Sr, pure and nickel and zinc substituted cobalt ferrite and ZnFe_2O_4 doping with Mg have been prepared.



XRD pattern, magnetic properties by VSM and SEM image of the synthesized products

Development of liquid ink (Blue, Magenta, Yellow & Black) for ceramic industries

Associates:

Nahid Sharmin, CSO & Director (Addl. Charge), PL
 Shirin Akter Jahan, PSO
 Md. Lutfor Rahman, SSO
 Sabrina Mostofa, SSO
 Md. Farid Ahmed, SO
 Md. Ashraful Alam, SO
 Bristy Biswas, SO

Duration:

July 2019 - June 2023

Budget: 9.0 Lac

Objective:

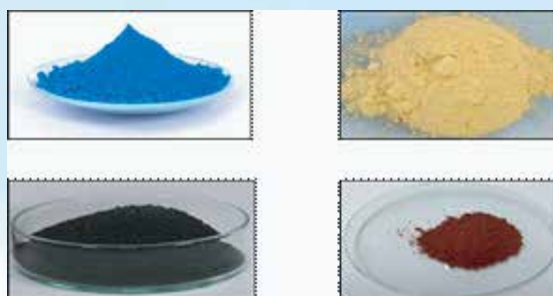
- ❖ Production of different color (Blue, Magenta, Yellow & Black) pigments of definite size and shape
- ❖ Characterization of the synthesized pigments
- ❖ Selection of appropriate solvents and surfactants for using the synthesized pigments as liquid inks
- ❖ Measurement of various properties viz. particle size, viscosity, density, surface tension, zeta potentials etc. of the liquid ink
- ❖ Application of developed liquid ink for ceramics decoration

Socio-economic importance:

- ❖ Ceramic inks are simply carriers of ceramic fine particles metallic oxide pigments that are used in automatic application techniques such as to decorate ceramic materials like tiles, tableware and other ceramics products through digital process
- ❖ Liquid inks are highly stable pigment with excellent resistance to light, weather, etc., which have resulted in their widespread use as a ceramic pigment
- ❖ Every year huge amounts of liquid ink are required for the digital decoration of ceramics tiles, tableware and sanitary wares
- ❖ The demand of liquid ink in ceramics industry is increasing rapidly, but there is no industry of liquid ink in our country. At present, all the liquid inks are imported from abroad. If the said project can be successfully completed, then it will mitigate the local demand as well as save huge foreign currency

Progress:

Four different colors (Blue, Black, Yellow & Red-Brown) have been synthesized. The process optimization for the development different colors and characterization are going on.



Developed Blue, Black, Yellow & Red-Brown

Enamel Research Division

Development of nano crystallized glass using coal ash

Associates:

Md. Saiful Quddus, SSO, PL
Md. Hasanuzzaman, SO
Mandira Saha, SO
Dr. Umme Sarmeen Akhtar, SSO
Muhammad Shahriar Bashir, PSO, IFRD
Dr. Sonjida Mustafi, PSO
Dr. Abdul Gafur, PSO, IFRD
Nahid Sharmin, CSO, IGCRT & Director, PP&PDC

Duration:

July 2020 - June 2024

Budget: 2.0 Lac

Objective:

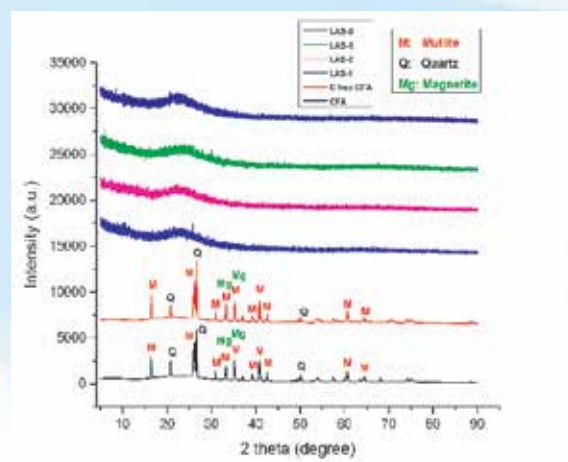
- ❖ To develop Nano-crystallized glass panel by utilizing locally available waste materials as an import substitute of natural stone and nano crystallized glass panel
- ❖ To develop a process technology for glass manufacturing industries of Bangladesh without changing their existing process units
- ❖ To synthesize Nano crystallized glass with increased fracture strength and fracture toughness
- ❖ To recycle the industrial hazardous waste materials like coal ash into the advanced materials

Socio-economic importance:

- ❖ Nano Crystallized glass Panels have exciting potential applications as countertop, kitchen top, wall cladding, facade, flooring, column/pillars, staircase, vanity sinks/basin, bathroom vanity top and so on.
- ❖ Nano Crystallized glass can be mass produced by the glass manufacturing industries of Bangladesh without changing the existing technologies

Progress:

- ❖ Few Lithium Aluminosilicate (LAS) glasses were successfully synthesized by mixing coal fly ash with different additives such as fluxing agent and network former then melted at about 1650°C, annealed at 600-700°C
- ❖ The synthesized glass properties were investigated by XRD and STA



XRD of Lithium-Aluminosilicate Glass & Coal Fly ash

Glass Research Division

Development of bioceramic polymer composite reinforced with graphene for treatment of tannery effluent

Associates:

Monika Mahmud, SO; PL
Dr. Samina Ahmed, CSO
Shirin Akter Jahan, PSO
Dr. Md. Humayun Kabir, SSO
Md. Sahadat Hossain, SO
Mashrafi Bin Mobarak, SO

Duration:

July 2020-June 2022

Budget: 2.0 Lac

Objective:

- ❖ The aim of this study is to develop the conventional bio ceramic-polymer composite with advance reinforcing materials for tannery water treatment process.

Socio-economic importance:

- ❖ Clean water is one of the goals of sustainable development our country. However clean and safe water still a burning question. For water treatment bioceramic material is used from a very long time. Our target is to develop a bioceramic-polymer composite by involving advance reinforcing material. This material possesses extraordinary mechanical properties which makes a potentially good reinforcement on bioceramic –polymer composites. Additionally the developed composite will be able to enhance efficiency in water treatment by dynamic separation. As our country still depended on imported bioceramic materials, thereby development of a composite using advance material will have a great impact on our economy.

Synthesis of calcium based compound from natural source for industrial application

Associates:

Md. Sahadat Hossain, SO, PL
Dr. Samina Ahmed, CSO
Shirin Akter Jahan, PSO
Monika Mahmud, SO
Mashrafi Bin Mobarak, SO

Duration:

July 2021 – June 2023

Budget: 2.5 Lac

Objective:

- ❖ Synthesis of calcium based compound from waste materials
- ❖ Purified calcium based compound can be used in our industrial sector

Socio-economic importance:

- ❖ High demand (3,00,000 MT per year) of calcium based compounds, for which we have to depend on the foreign source. These compounds can be synthesized from locally available source.

Synthesis of nano crystallite biomaterial and natural polymer based composite for treatment of textile effluent

Associates:

Md. Sahadat Hossain, SO, PL
Dr. Samina Ahmed, CSO
Monika Mahmud, SO
Mashrafi Bin Mobarak, SO
Dr. Md. Humayun Kabir, SSO, INARS

Duration:

July 2021-June 2023

Budget: : 3.0 Lac

Objective:

- ❖ Nano crystallite biomaterials will be synthesized to prepare bio-composite material for treating textile effluent

Socio-economic importance:

- ❖ Pollutants from textile effluent are directly or indirectly affecting the environment as well as human life. For a better and healthier life the effluent from textile industries must be reduced. This project will help to reduce the coloring agent or dye of textile industries for clean environment.

Application of hydroxyapatite for control release drug delivery

Associates:

Mashrafi Bin Mobarak, SO, PL
Dr. Samina Ahmed, CSO
Md. Sahadat Hossain, SO
Monika Mahmud, SO
Dr. Md. Humayun Kabir, SSO, INARS

Duration:

July 2021- June 2023

Budget: 3.0 Lac

Objective:

- ❖ The aim of this study is to synthesize Hydroxyapatite for control release drug delivery and evaluate the drug release profile

Socio-economic importance:

- ❖ Control release of antibiotic with bioactive hydroxyapatite will be more effective way of dispense of antibiotic. No recorded data were obtained for the control release drug delivery. This technology will be a great addition to the medical sector

Refractory and Structural Ceramic Research Division

Production of Zeolite based composite material for Carbon-di-Oxide Scavenger

Associates:

Nahid Sharmin, CSO, IGCRT & Director, PP&PDC
 Dr. Shirin Aktar Jahan, PSO
 Md. Sagirul Islam, SSO
 Juliya Khanam, SSO
 Md. Saiful Quddus, SSO
 Md. Golam Mostofa, SO
 Md. Shahadaat Hossain, SO

Duration:

July 2020 - June 2023

Budget: 3.0 Lac

Objective:

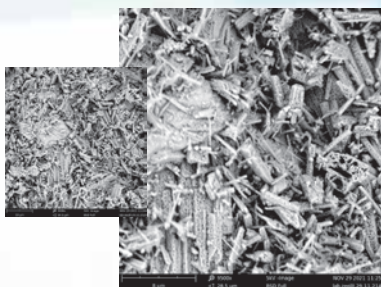
- ❖ Synthesis of zeolite from locally available raw materials
- ❖ Development a technology by using zeolite based nanocomposite for carbon-di-oxide capture

Socio-economic importance:

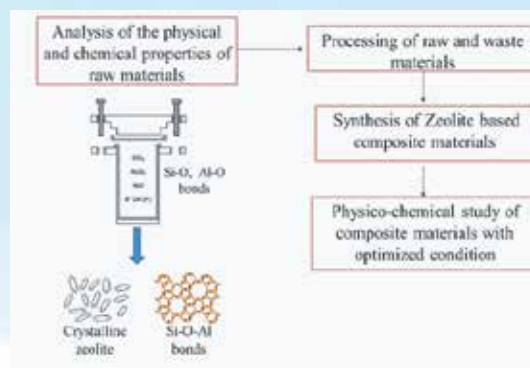
- ❖ Research on technical development of CO₂ capture as well as green/clean environment one of the prime goal of the present government in Bangladesh
- ❖ Zeolite has many uses including concrete production, soil-conditioners, catalysts in drug (pharmaceutical) production and in the petrochemical industry and animal food
- ❖ For clean environment, daily purpose and catalytic activity for industrial use of zeolite are very important and useful
- ❖ Our proposed targeted technology would be low cost, effective highly efficiency, of course environment friendly and easily fabricated which would be greatly contributed in the development of sustainable technology
- ❖ This Special R&D project will strength the ongoing process of developing climate change and human fundamental resources

Progress:

- ❖ Zeolite based composite materials have been synthesized
- ❖ Characterization of composite material has been completed
- ❖ Preparation of composite material is going on for Carbon-di-Oxide Scavenger



SEM Images of Synthesized Product



Zeolite based composite material Synthesis

Production of silica refractory brick from river sand

Associates:

Md. Sagirul Islam, SSO, PL
Nahid Sharmin, CSO
Dr. Umme Sarmeen Akhtar, SSO
Mohammad Golam Mostafa, SO
Md. Shahadat Hossain, SO

Duration:

July 2020 - June 2023

Budget: 5.0 Lac

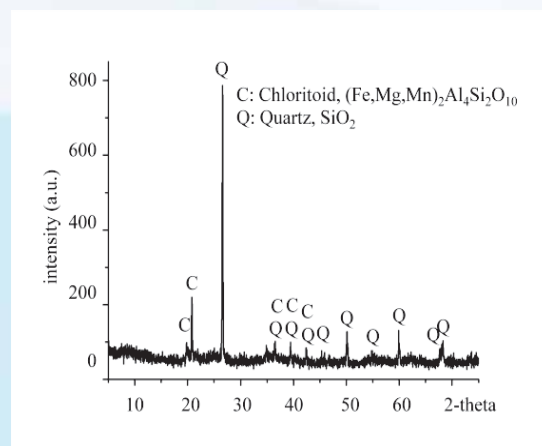
Objective:

- ❖ Development of environment friendly silica refractory brick
- ❖ Utilization of river sand as raw material to solve the river navigation problem

Socio-economic importance:

- ❖ The sands of Bangladesh's rivers are potentially and economically important hosts for silica sand resources
- ❖ Silica sand is one of the most abundant minerals that can be found in diverse ways such as in quartz crystals, huge forming hills, quartz sand or silica sand, sand stone and so forth
- ❖ The first work of this project is based on extraction of silica sand from sands of the Padma River and quantification and qualification of extracted silica sand as glass and and then utilize the quartz sand as raw materials of refractory brick
- ❖ River sands contain high amount of silica which can be used in many sectors such as glass making sectors, the refractory applications required a high purity, construction etc

Progress: Preliminary investigations had been done to determine the physical, chemical, thermal and mechanical properties with mineralogical constitution of raw materials by XRD analysis. Different amounts of fire clay were added as binder to the river sand of silica bricks. The specimens molded according to ASTM standards by using semi-dry pressing method at pressure. After drying process at 110°C the specimens fired at firing temperatures (1000, 1100, 1200, 1300 and 1400)°C. The fired specimens have been investigated to determination the physical properties including bulk density, porosity, and the mechanical properties including compressive strength and thermal properties including thermal conductivity.



XRD of Refractory sample

Development of Expanding agent for bricks and aggregates

Associates:

Dr. Umme Sarmeen Akhtar, SSO, PL
Md. Sagirul Islam, SSO
Md. Saiful Quddus, SSO
Mohammad Golam Mostafa, SO
Md. Shahadaat Hossain, SO

Duration:

July 2020 - June 2022

Budget: 2.5 Lac

Objective:

- ❖ To develop a process for synthesizing of expanding agent for building materials
- ❖ To optimize the synthesis process
- ❖ To apply the optimized product into building materials

Socio-economic importance:

- ❖ The expanding/binding materials make low density of building materials
- ❖ It can minimize the dead load problem
- ❖ It can save building from earthquake force
- ❖ It has higher thermal insulation properties than conventional one
- ❖ This project will be cost effective and environment friendly which have a better impact on the socioeconomic development



Expansion of Bricks and Aggregatess

Progress:

- ❖ Physico-chemical study of raw materials was determined
- ❖ Expanding agent of different composition was prepared
- ❖ Optimization of mixing ratios of expanding agents with raw materials for proper shape has been going on

Improvement of a process for commercial admixture used for concrete and cement industries

Associates:

Dr. Umme Sarmeen Akhtar, SSO, PL
Md. Sagirul Islam, SSO
Juliya Khanom, SSO
Md. Saiful Quddus, SSO
Md. Ashraful Alam, SO
Mohammad Golam Mostafa, SO

Duration:

July 2020 - June 2022

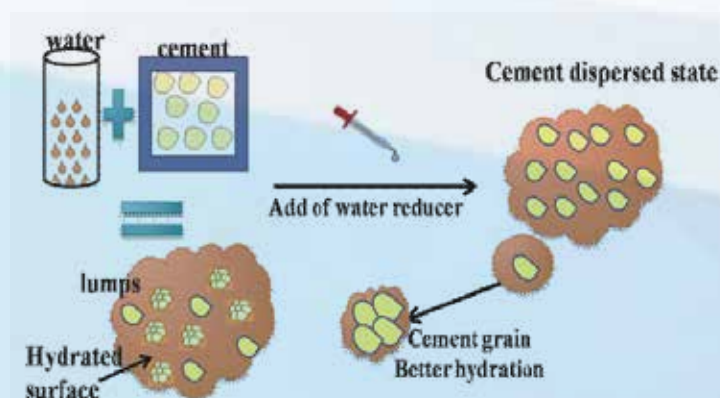
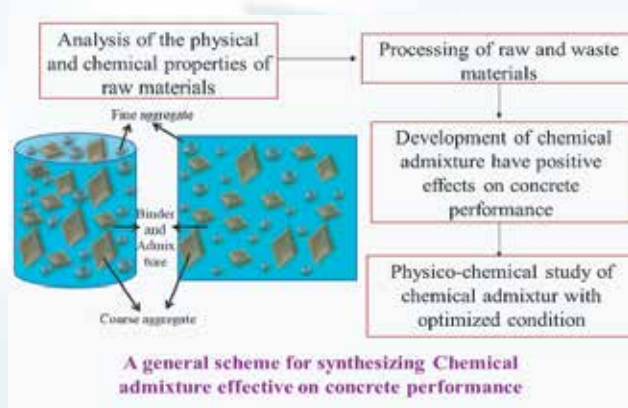
Budget: 3.0 Lac

Objective:

- ❖ To develop a process for synthesizing water reducer, retarder, accelerating admixture which could be used in cement and concrete industries of Bangladesh
- ❖ To develop import substitute chemical admixture production method
- ❖ To optimize the synthesis procedure of admixture

Socio-economic importance:

- ❖ Building/ Construction chemicals are becoming one of the significant elements of chemical business playing a significant part in global infrastructure growth as well as Bangladesh
- ❖ The demand for chemical admixture for cement and concrete industries in Bangladesh is increasing day by day
- ❖ Admixture can enhance the workability, durability, fluidity, adjusting setting time of the concrete structure



Progress:

- ❖ Optimzation the mixing ratio of admixture with cement has been completed
- ❖ Development of different physical properties has been goin on
- ❖ Characterizaion of Admixture has been going on

Development of Geopolymer concrete blocks from locally available solid wastes.

Associates:

Md. Sagirul Islam, SSO, PL
Nahid Sharmin, CSO & Director, PP & PDC
Dr. Umme Sarmeen Akhtar, SSO
Mohammad Golam Mostafa, SO
Md. Shahadat Hossain, SO

Duration:

July 2020 - June 2022

Budget: 2.0 Lac

Objective:

- ❖ To develop geopolymer concrete from locally available solid wastes
- ❖ To Optimize the Geopolymer concrete mix design with different solid wastes

Socio-economic importance:

Geopolymer concrete is a sustainable, economical, eco-friendly, and high-strength concrete. The GPC utilizes industrial solid wastes like flyash and slag as binding material and is activated by the alkaline solution containing NaOH and Na_2SiO_3 in the design mix. The experimental investigation analyzes both GPC and OPC concrete's physical and mechanical properties for the same mix design and analyzes the concrete's cost and sustainability. The GPC has less embodied energy compared to the OPC concrete. The cost of the GPC at a bulk level reduced the cost of up to 40% of the OPC concrete.

Progress:

Geopolymer concrete (GPC) is one of the sustainable means to reduce CO_2 emissions and energy utilization during the production and utilization during the production and utilization of cement in the construction industry. Geopolymers are amorphous aluminosilicates which can be produced by the reaction between silica and aluminosilicate in an alkaline medium (NaOH and/or KOH) at ambient or elevated (30-100 °C) temperature. Due to its simple, energy efficient and eco-friendly production method, excellent durability and good mechanical properties, geopolymers can replace conventional materials from low tech application (building industry, waste immobilisation) to high tech industry (ceramics with special properties, composites).



Before Curing



After Curing

- The grinding fineness improved the geopolymer uniaxial compressive strength from the initial 2.6 MPa up to 7.9 MPa.
- The optimum NaOH concentration of the alkaline activator was 8 M for 60 °C heat treatment (maximum compressive strength was 14.3 MPa) and 10 M for 90 °C.

Application of Response surface methodology for the Optimization of mix designed concrete using locally available materials

Associates:

Dr. Umme Sarmeen Akhtar, SSO, PL
Dr. Md. Anwar Hossain, PSO, BCSIR Laboratories, Dhaka
Md. Sagirul Islam, SSO

Duration:

July 2021 - June 2022

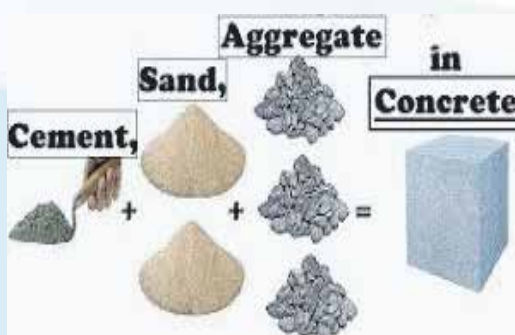
Budget: 3.0 Lac

Objective:

- ❖ Optimize of mix design of concrete for the production of high-performance concrete with higher compressive strength
- ❖ Production of high-performance concrete with locally available raw materials.
- ❖ Evaluate of the effects of these parameters on the quality of concrete production by using response surface methodology

Socio-economic importance:

The construction industries are growing faster. The use of concrete as a construction material is in great demand, thus requiring the industry to make a wide choice in the selection of its building components. In order to meet the increasing demand on the performance of these components, it is necessary to adapt waste material recycling to compensate the lack of natural resources and obtain alternative ways conserving the environment. Concrete is the most widely used construction material all over the world.



Mix designed of concrete

Progress:

Raw materials collection has been completed. R&D related Minor Equipment, Consumable, Chemicals, Raw Materials, Glassware have been purchased. Samples are being prepared through two types of categories (with or without admixture addition) according to M20 grade mix designs. Concrete cylinder molds with and without admixture have been prepared for 3, 7, 28, 60- and 90-days curing period. It takes a long time to get test results. Optimization of Mix design of concrete is required for proper rise of its compressive strength. So therefore a 6 months extension is mandatory for this project completion.

Ceramic Research Division

- ❖ *Preparation of Bio-char from waste materials for Portable Ceramic Water Filter*
- ❖ *Development of light weight Ceramic tiles from waste plastic materials of Bangladesh*

Inorganic Pigment and Chemical Research Division

- ❖ *Development of antimicrobial coating for ceramic tile*

Ceramic Raw Materials and Ceramic Materials Testing Division

- ❖ *Synthesis of magnetite based nano composites adsorbent for the treatment of organic dye contaminated textile waste water*

Completed R&D Projects

Glass Research Division

(Special Allocation Project)

- ❖ *Development of nano-hydroxyapatite based adsorbent for environmental application*



Ceramic Research Division

Preparation of Bio-char from waste materials for Portable Ceramic Water Filter

Associates:

Dr. Sonjida Mustafi, PSO, PL
Rexona Khanom, SSO
Md. Mahfujul Hasan, SO
Nigar Sultana Pinky, SO

Duration:

July 2020 - Jun 2022

Budget: 3.5 Lac

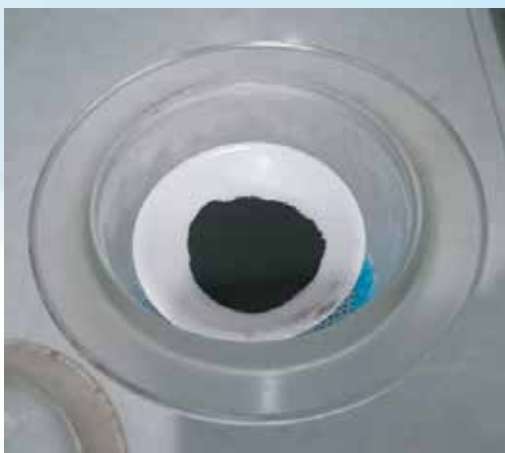
Objective:

- ❖ Development of process for portable ceramic water purification system
- ❖ Solid Waste management of Bangladesh
- ❖ Characterization of the prepared products

Socio-economic importance:

- ❖ By establishing Bio-char and water filter industries, it can contribute to our GDP as well as create employment opportunities
- ❖ It also helps to reduce environmental pollution of Bangladesh
- ❖ Bio-char can directly contribute to the SDGs of our country

Outcome: Efficient biochar has been produced.



Biochar

Development of light weight Ceramic tiles from waste plastic materials of Bangladesh

Associates:

Dr. Sonjida Mustafi, PSO, PL
Rexona Khanom, SSO
Md. Mahfujul Hasan, SO
Nigar Sultana Pinky, SO

Duration:

July 2020 - Jun 2022

Budget: 4.0 Lac

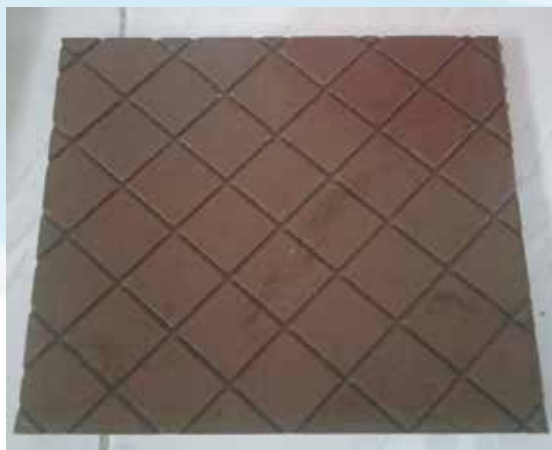
Objective:

- ❖ Plastic Waste Management of our country
- ❖ Development of process for cost effective light weight ceramic tiles

Socio-economic importance:

- ❖ Accumulation of waste plastic materials can result into hazardous effects to both human and aquatic life. Utilization of these waste plastic materials to produce cost effective ceramic tiles and to protect the environment is time demand
- ❖ It will reduce the dependency of imported ceramic raw materials from other countries and save the foreign money

Outcome: Light weight Ceramic tiles has been developed



Plastic tiles

Ceramic Raw Materials and Ceramic Materials Testing Division

Synthesis of magnetite based nano composites adsorbent for the treatment of organic dye contaminated textile waste water

Associates:

Juliya khanam, SSO, PL
Nahid Sharmin, CSO & Director, PP&PDC
Dr. Shirin Akter Jahan, SSO
Dr. Umme Sarmeen Akthar, SSO
Bristy Biswas, SO
Md. Hasanuzzaman, SO
Mashrafi Bin Mobarak, SO

Duration:

July 2020 - June 2022

Budget: 2.5 Lac

Objective:

- ❖ To develop magnetite based nano composites
- ❖ To optimize the process technology for cost minimization
- ❖ To characterize synthesized nano composites
- ❖ To apply synthesized nano composites for waste water treatment

Socio-economic importance:

- ❖ Many of the industrial units drain out effluents directly into the river Shitalakkhya, Burigonga, Turag, Dhalessshori near Dhaka, Narayangong and Gajipur
- ❖ Untreated effluent has been discharged into the river by the industries with several major sources of contaminants, as a result adverse effect on the environment and other ecological receptor such as: the deadly poisonous toxic industrial effluent seriously affected the aquatic lives and the farming also affected because the surrounding lands have become unsuitable for cultivation
- ❖ The polluted water causes harms such as painful skin diseases, diarrhea, food poisoning, and gastrointestinal problems in the short term and serious health implications such as respiratory problems when toxic materials accumulate body in the long term
- ❖ Global warming is a direct result of the pollutants released by such industries

Inorganic Pigment and Chemical Research Division

Development of antimicrobial coating for ceramic tile

Associates:

Dr. Shirin Akter Jahan, PSO, PL
Nahid Sharmin, CSO
Sabrina Mostofa, SSO
Md. Ashraful Alam, SO
Md. Khokan Chandra Modak, SO
Mandira Saha, SO
Dr. Sahana Parveen, CSO, IFST

Duration:

July, 2019-June 2022

Budget: 8.75 Lac

Objective:

- ❖ To develop an antimicrobial coating material for ceramic tiles
- ❖ To apply this prepared coating material on ceramic tiles to prevent transmission of infection for a healthy life.

Socio-economic importance:

- ❖ Antimicrobial tiles disinfect, sanitize, reduce, or mitigate growth or development of microbes while protecting surfaces from contamination, fouling, or deterioration caused by bacteria, viruses, fungi, protozoa, algae, or slime.
- ❖ Antibacterial tiles can be widely used in hospital, toilet, bathroom, kitchen etc. where the level of sanitation must be as high as possible.

Achievement:

- i) Preparation of silver nano particles as antimicrobial agent using sol-gel processes with different concentrations and temperature has been completed
- ii) The mentioned samples were prepared using microemulsion processes with different water in oil ratio has been completed
- iii) The synthesized composites have been characterized by Scanning electron microcopy (SEM), X-ray powder diffraction (XRD) and Nano Particle Size Analyser
- iv) Microbial reduction test was done with different types of gram positive and gram negative bacteria. Microbial reduction test shows that these coated tiles are 60-96% effective against bacteria. The results are given below-

SL No.	Test Microorganism	Percentage of Reduction
01.	Psedomonas aeruginosa	96%
02.	Bacillus subtillis	61%
03.	Escherichia coli	74%
04.	Staphylococcus aureus	86%



Special Allocation Project

Glass Research Division

Development of nano-hydroxyapatite based adsorbent for environmental application

Associates:

Dr. Samina Ahmed, CSO
Md. Sahadat Hossain, SO

Duration:

July 2021 - June 2022

Budget: 3.0 Lac

Objective:

- ❖ To synthesize nano hydroxyapatite from waste materials to treat industrial effluent

Socio-economic importance:

- ❖ To synthesize nano hydroxyapatite from waste materials to treat industrial effluent. Different industries discharge different types of contaminants to the environment such as dye, salts, surfactants, heavy metals and mineral oils as the textile effluent. The presence of color mostly in wastewaters is due to the discharge of unfixed dyes, which are incapable of reacting with the fabrics. Discharge of untreated textile mill effluents is known to cause adverse environmental impacts. It is mandatory to treat such wastewaters for the protection of environment and ecosystems. Therefore development of nano-hydroxyapatite based adsorbent to treat industrial effluents will have significant socio-economic importance in this regard.

Present status: The project has completed successfully.

Achievement: One manuscript has been submitted titled “Enriched crystal structure and band gap exploiting copper doping in bio-ceramic for amplified quantum yield to photo catalyze textile dye”. Md. Sahadat Hossain, Supanna Malek Tuntun, Newaz Mohammad Bahadur and Samina Ahmed*, Materials Chemistry Frontiers, Submitted, 2022.

Ceramic Research Division

- ❖ *Production of Low Cost Lead Free Ceramic tableware*

Ceramic Raw Materials and Ceramic Materials Testing Division

- ❖ *Development of Nickel Ferrite Nanoparticles in pure and doped forms for photocatalysis of textile effluent*

Inorganic Pigment and Chemical Research Division

- ❖ *Modification of organoclay for the removal of pharmaceutical contaminates from water*
- ❖ *Antimicrobial activity of Silver and Copper doped Titania Coating substrate*

Glass Research Division

- ❖ *Preparation of biocompatible bio-scaffold from waste natural sources for orthopedic application*
- ❖ *Preparation of ceramic-graphene oxide based composite for the removal of textile dyes from aqueous system*

Proposed R&D Projects

Refractory and Structural Ceramic Research Division

- ❖ *Development a process for the production of polyoxometalate and study of its photo catalytic activity*
- ❖ *Quality Assessment of different type of clays for refractory industries in Bangladesh*



Ceramic Research Division

Production of Low Cost Lead Free Ceramic tableware

Associates:

Rexona Khanom, SSO, PL
Dr. Sonjida Mustafi, PSO
Nigar Sultana Pinky, SO

Duration:

July 2022- June 2024

Budget: 3.0 Lac

Objective:

- ❖ Production of Lead free piezoelectric perovskite ceramic
- ❖ To prevent Lead (Pb) leaching to foods, drinks and beverages
- ❖ To reduce import of raw materials from abroad
- ❖ Production of tablewares of various structured and decorative shapes
- ❖ Recycling of Leaded ceramic tablewares waste

Socio-economic importance:

- ❖ Lead zirconate titanate (PZT), $Pb(Zr_x Ti_{1-x})O_3$ is one of the most promising, smart, environment friendly, Lead free piezoelectric ceramic perovskite material, exhaustively studied piezo system having relatively low manufacturing cost, it will be got importance and newly preferential material for the production of ceramic tablewares of Bangladeshi industries.

Ceramic Raw Materials and Ceramic Materials Testing Division

Development of Nickel Ferrite Nanoparticles in pure and doped forms for photocatalysis of textile effluent

Associates:

Bristy Biswas, SO, PL
Nahid Sharmin, CSO & Director (Addl. Charge), PP & PDC
Md. Habibur Rahman Bhyuian, CSO & Director (Addl. Charge), IGCRT
Md. Lutfor Rahman, SSO
Juliya Khanam, SSO
Md. Farid Ahmed, SO

Duration:

July 2022- June 2024

Budget: 3.0 Lac

Objective:

- ❖ Synthesis of Nano Nickel Ferrite ($NiFe_2O_4$) particles
- ❖ Development of modified Nickel Ferrite system
- ❖ Characterization of the synthesized Nano particles
- ❖ Application of the synthesized nano particles as photo catalyst using different dyes

Socio-economic importance:

- ❖ Remediation of industrial effluents
- ❖ Reduction of environmental pollution
- ❖ Recycling of water resources

Glass Research Division

Preparation of ceramic-graphene oxide based composite for the removal of textile dyes from aqueous system

Associates:

Monika Mahmud, SO, PL
Dr. Samina Ahmed, CSO
Md. Habibur Rahman Bhyuian, CSO & Director (Addl. Charge), IGCRT
Dr. Shirin Akter Jahan, PSO
Dr. Sabina Yasmin, SSO
Md. Sahadat Hossain, SO
Mashrafi Bin Mobarak, SO

Duration:

July 2022 -June 2024

Budget: 10.0 Lac

Objective:

- ❖ Synthesis of calcium phosphate-based compounds from waste natural source
- ❖ Synthesis of organic polymer from waste material
- ❖ Preparation of bio-scaffold from calcium based compounds and organic polymer

Socio-economic importance:

As our country still depended on imported ceramic materials for water treatment, thereby development of a new composite using advance material will have a great impact on our economy material will have a great impact on our economy.

Preparation of biocompatible bio-scaffold from waste natural sources for orthopedic application

Project Advisor: Prof. Dr. Md. Aftab Ali Shaikh, Chairman, BCSIR

Associates:

Md. Sahadat Hossain, SO, PL
Dr. Samina Ahmed, CSO
Monika Mahmud, SO
Mashrafi Bin Mobarak, SO
Dr. Shirin Akter Jahan, PSO
Md. Najem Uddin, SO, BCSIR Laboratories, Dhaka

Duration:

July 2022 - June 2024

Budget: 21.0 Lac

Objective:

- ❖ Synthesis of calcium phosphate-based compounds from waste natural source
- ❖ Synthesis of organic polymer from waste material
- ❖ Preparation of bio-scaffold from calcium based compounds and organic polymer

Socio-economic importance:

Import substitute biomaterials will be synthesized from locally available waste sources to minimize the local demand.

Inorganic Pigment and Chemical Research Division

Modification of clay for the removal of pharmaceutical contaminants from water

Associates: Sabrina Mostofa, SSO, PL Dr. Shirin Akter Jahan, PSO Md. Ashraful Alam, SO Dr. Samina Ahmed, CSO, Dhaka Lab. Dr. Md. Humayun Kabir, SSO, INARS Dr. Sabina Yasmin, SSO, INARS Raton Kumar Biswas, SO	Duration: July 2022 – June 2024 Budget: 5.0 Lac
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Objective:

- ❖ Modification of organoclay using different surfactants.
- ❖ Modified clay use as efficient adsorbent for the removal of pharmaceutical contaminants from water

Socio-economic importance

- ❖ In Bangladesh there are many pharmaceutical company and huge amount of wastes produce during manufacturing, housekeeping and maintenance operations everyday which are being directly discharged into the surrounding channel, agricultural fields, irrigation channels, surface water and mostly enter into Turag and Shitalakkhya River
- ❖ The project aims to develop organoclay and apply these products in removal of pharmaceutical pollutants which would be a significant step in the context of environmental pollution in Bangladesh. Thus it has a significant role in managing the clean environment in the context of our country

Antimicrobial activity of Silver and Copper doped Titania Coating substrate

Associates: Md. Ashraful Alam, SO, PL Dr. Shirin Akter Jahan, PSO Sabrina Mostafa, SSO Dr. Samina Ahmed, CSO Md. Najem Uddin, SO, BCSIR Laboratories Dhaka Raton Kumar Biswas, SO	Duration: July 2022 - June 2024 Budget: 2.0 Lac
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Objective:

- ❖ To Develop an antimicrobial coating
- ❖ To Measure the antimicrobial activity of the coating

Socio-economic importance:

- ❖ To achieved the microbe free environment
- ❖ Prevent the originate of microbial growth
- ❖ Ensure the safety health, hygiene and environment



Refractory and Structural Ceramic Research Division

Quality Assessment of different type of clays for refractory industries in Bangladesh

Associates: Md. Golam Mostofa, SO, PL Dr. UmmeSarmeen Akhtar, SSO Md. Sagirul Islam, SSO Juliya Khanam, SSO	
Duration: July 2022 -June 2024	Budget: 1.90 Lac

Objective:

- ❖ Main objectives of this project is to evaluate the Characteristics of local clay from different areas in Bangladesh
- ❖ To make a Quality Assessment database of locally available clay which is beneficial for ceramic industries.

Socio-economic importance

- ❖ Clay industry is playing a vital role in the development of infrastructure as the economy of Bangladesh is growing over the years
- ❖ At present, clay manufacturer's association found that there is required capacity of 60 million tons per annum in Bangladesh
- ❖ According to the market research by USADA at the end of 2019 the market size of the ceramics industry in Bangladesh was Tk 7,550 core

Development a process for the production of polyoxometalate and study of its photo catalytic activity

Associates: Dr. Umme Sarmeen Akhtar, SSO, PL Dr. Shirin Aktar Jahan, PSO Md. Sagirul Islam, SSO Md. Golam Mostofa, SO Gorungo Ray, SO Fahmidul Haque, RC	
Duration: July 2022 - June 2024	Budget: 4.75 Lac

Objective:

- ❖ Synthesis of polyoxometal based water oxidation photo catalyst
- ❖ Standardization of polyoxometal based water oxidation photo catalyst

Socio-economic importance

- ❖ Polyoxometalates (POMs), which are anionic metal oxide clusters, have recently attracted considerable attention as photocatalysts because of their unique photo induced charge-transfer properties, redox properties, acid–base properties, photochemical response, ionic charge, conductivity, and ionic weights and reactivities. Water-soluble polyoxometalate complexes, such as silicododecatungstate [SiW₁₂O₄₀]⁴⁻, have been known for the past 20 years to be efficient homogeneous photo catalysts for the formation of H₂ from acidic aqueous solutions containing alcohol (typically methanol) where the alcohol acts as an electron source to the photo catalysts and the reduced photo catalysts cause the reduction of H⁺ in water to H₂.

Annual Development Project (ADP)

Project Name: **‘Strengthening of Institute of Glass and Ceramic Research and Testing (IGCRT) of BCSIR’**

Project duration: 01 July 2018 to 31 December 2022

Ministry of Science and Technology

Bangladesh Council of Scientific and Industrial Research (BCSIR)

Implementation Progress:

Procurement of 21 advanced instruments and installation have been successfully completed under SIGCRT project of BCSIR

The establishment of world class laboratories and the development of advanced technologies in the field of glass and ceramics are in progress

The scientists working in IGCRT have been completed training program on glass and ceramics in National Institute of Technology, Rourkela, Odisha, India

On 15 June 2021, the workshop titled “মুজিববর্ষের প্রতিশ্রুতি, কাচ-সিরামিক শিল্প উন্নয়নে অগ্রগতি” was successfully completed with the active participation of stakeholders

Scientists of IGCRT have been successfully completed training program on “Fundamentals of Industrial and Advanced Glass and Ceramic Technology” in the Department of Ceramic Engineering of NITR, India in the following subjects:

- (i) Development of high energy-density Ni-rich layered NMM oxide cathodes for Next-Generation Cobalt-Free Li-Ion Batteries
- (ii) Mechanochemical synthesis of high entropy oxide for functional application
- (iii) Synthesis of calcium deficit hydroxyapatite in pure form for advanced application as biomaterial
- (iv) Development of high strength light weight porous ceramic
- (v) Development of borohydride-derived Europium-doped zirconia nanoparticles for photoluminescence studies
- (vi) Fabrication and characterization of ferroelectric based semiconducting oxide materials for photo-ferro/piezocatalytic applications
- (vii) Synthesis of bioglass/bioactive glass by melt quenching and sol-gel method
- (viii) Synthesis of Europium-doped zirconia as photoluminescence materials

**Training Program by SIGCRT
Project of BCSIR in NITR , India**

**Inaugural
Ceremony**



International training program on
“Fundamentals of Industrial and
Advanced Glass and Ceramic
Technology” at Department of Ceramic
Engineering, in National Institute of
Technology, Rourkela, Odisha, India
from 25th May 2022 to 23rd June 2022
under the SIGCRT project of BCSIR

Some Glimpse of our Journey



Class Session



Experimental Session



Industry Visit



Farewell

Facilities of SIGCRT Project



X-ray Photoelectron Spectrometer (XPS)

XPS is used to analysis the surface for elemental composition, empirical formula, chemical state and electronic state of the elements within a material

TEM determines crystalline structures, particle size, internal fractures and contamination of materials



Transmission Electron Microscope (TEM)



Vibrating Sample Magnetometer (VSM)

VSM identifies magnetic moment information of entire samples

WD-XRF provides high precision analyses of major and minor elements in a wide variety of samples



Wavelength Dispersive X-Ray Fluorescence Spectrometer (WDXRF)



X-ray Diffractometer (XRD)

XRD identifies crystal structure lattice parameter size, shape and stresses in the material crystallographic texture

STA determines melting and crystallization behavior, glass transition temperature, specific heat capacity, kinetic study, reaction enthalpies etc.



Simultaneous Thermal Analyzer (STA)



**Dynamic light scattering
particle size analyzer**

DLS determines size of nanoparticles, latex size, and colloid size etc. and particles sizes less than nanometer size

Dilatometer identifies coefficient of thermal expansion, glass transition temperature etc.



**Transmission Electron
Microscope (TEM)**



**Thermal Conductivity
Meter**

It measures thermal properties such as heat flow, thermal conductivity, thermal diffusivity, and heat capacity.

It measures impedance, susceptance, resistance, capacitance, inductance of electrical components



Impedance Analyzer



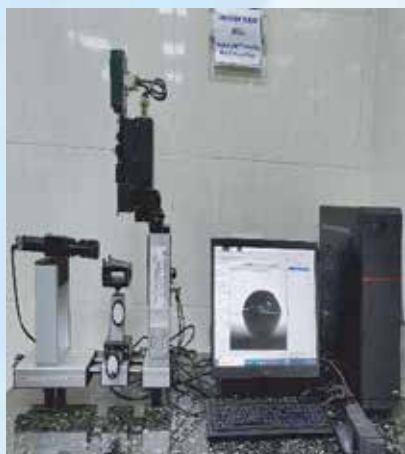
**Mercury Intrusion
Porosimeter**

It measures total intrusion volume, total pore area, volume median pore diameter, bulk density, skeletal density, and porosity

It determines all kind of pore size including open pore, close pore, blind pore, through pore, contact angle etc.



Capillary Flow Porometer



Drop Shape Analyzer

It determines the contact angle and the surface tension from the shadow image of a sessile drop or from the shadow image of pendant drop

UV-vis-NIR determines the optical properties (transmittance, reflectance and absorbance) of liquids and solids.



UV-Vis-NIR Spectrophotometer



Glass Melting Furnace (1800 °C)

It is used to melt various mixture of raw materials to produce glass

It is used to anneal the molten glass



Annealing Furnace (1200 °C)



Furnace (1400 °C)

It is used for calcining, tempering, annealing, sintering

It is used for high temperature sintering and refractories production



Furnace (1800 °C)

R&D Outputs Paper Published

1. Modification of the crystallographic parameters in a biomaterial employing a series of gamma radiation doses. *Molecular Systems Design and Engineering*, (Accepted, 15 June 2022), Md. Sahadat Hossain, Md. Aftab Ali Shaikh, Md. Saifur Rahaman and Samina Ahmed
2. New analytical models for precise calculation of crystallite size: Application to both synthetic (hydroxyapatite) and natural (eggshell) crystalline material. *Chemical Papers*, (Accepted, 6 June 2022), Md. Sahadat Hossain, Monika Mahmud, Mashrafi Bin Mobarak, Sazia Sultana, Md. Aftab Ali Shaikh and Samina Ahmed.
3. Probing the photocatalytic competency of hydroxyapatite synthesized by solid state and wet chemical precipitation method. *Journal of Molecular Structure*, 2022, 1252, 132142, Mashrafi Bin Mobarak, Md. Sahadat Hossain, Monika Mahmud, Sazia Sultana, Zenefar Yeasmin and Samina Ahmed.
4. Coupled effect of particle size of the source materials and calcination temperature on the direct synthesis of hydroxyapatite. *Royal Society Open Science*. 2021, 8, 210684, Md. Sahadat Hossain, Monika Mahmud, Sazia Sultana, Mashrafi Bin Mobarak, M. Saiful Islam and Samina Ahmed.
5. Redispersible polymer powder modified cementitious tile adhesive as an alternative to ordinary cement-sand grout. *Heliyon*. 2021, 7, e08411, Mashrafi Bin Mobarak, Md. Sahadat Hossain, Monika Mahmud and Samina Ahmed
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14. Synthesis of nano-sized magnetic iron oxide by a simple and facile co-precipitation method. *Bangladesh Journal of Scientific and Industrial Research*, Bangladesh J. Sci. Ind. Res. 57(2), 67-76, 2022. J. Khanam*, M. F. Ahmed, SK. M. Zaman, N. Sharmin and S. Ahmed.
15. Microfibrillated Cellulose-Silver Nanocomposite Based PVA Hydrogels and Their Enhanced Physical, Mechanical and Antibacterial Properties. *Journal of Polymers and the Environment (Springer)*, 30, 2875–2887 (2022), Md. Sabbir Hasan, Jannat Al Foisal, G. M. Arifuzzaman Khan, Rownok Jahan, Md. Hasanuzzaman, Md. Shamsul Alam, M. Minnatul Karim, M. A. Gafur Muhammad Angkan Khan, Md. Abdus Sabur.
16. Natural Sunlight Driven Photocatalytic Removal of Toxic Textile Dyes in Water Using B-Doped ZnO/TiO₂ Nanocomposites. *Catalysts (MDPI)*, 2022, 12, 308. Romana Akter Shathy, Shahriar Atik Fahim, Mithun Sarker, Md. Saiful Quddus ,Mohammad Moniruzzaman, Shah Md. Masum, and Md. Ashraful Islam Molla.

Process Accepted/Submitted

Sl. No	Process Title	Status
1.	Preparation of superplasticizer as concrete admixture	Leased out
2.	Development a process of chemical admixture used for concrete and cement industries	Leased out
3.	Development of Energy Efficient Brick from solid wastes	Ready for leased out

Patent Accepted/Submitted

Sl. No	Patent Titles	Name of The Scientists	Status
1.	Development of a process to induce antibacterial and antifungal properties in hydroxyapatite with the aid of gamma radiation.	Md. Sahadat Hossain, Prof. Dr. Md. Aftab Ali Shaikh, Monika Mahmud, Md. Mashrafi Bin Mobarak, Md. Md. Saifur Rahaman (AEC) and Samina Ahmed	Submitted
2.	Synthesis of nano-cellulose from used jute (<i>Corchorus capsularis</i>) fabrics.	Md. Sahadat Hossain, Monika Mahmud, Md. Mashrafi Bin Mobarak, and Samina Ahmed	Submitted
3.	Development of 2D material incorporated metal based composite adsorbent for combating environmental pollutants	Monika Mahmud, Md. Sahadat Hossain, Mashrafi Bin Mobarak, and Samina Ahmed	Submitted
4.	A process for the synthesis of copper (II) oxide nano-particle using fish scale (<i>labeo rohita</i>)	Mashrafi Bin Mobarak, Monika Mahmud, Md. Sahadat Hossain, and Samina Ahmed	Submitted
5.	The preparation of nano-sized magnetic materials, strontium hexaferrite for ceramic field	Nahid Sharmin, Md. Lutfor Rahman, Md. Farid Ahmed, Bristy Biswas	Submitted
6.	Production of Vermi and Organic Vermicompost from a composition using Bean seeds and vermi.	Rexona Khanom	Submitted

Other Portfolios

Seminar/Conference/Workshop/Training

Sl. No	Name of the Seminar/Conference/Workshop/Training	Name of the Participants
1.	International training program on “Fundamentals of Industrial and Advanced Glass and Ceramic Technology” at Department of Ceramic Engineering, National Institute of Technology, Rourkela, Odisha, India from 25th May 2022 to 23rd June 2022 under the ambit of “Strengthening of Institute of Glass and Ceramic Research and Testing (IGCRT) of BCSIR” project	Dr. Shirin Akter Jahan, PSO Md. Lutfor Rahman, SSO Juliya Khanam, SSO, Md. Farid Ahmed, SO, Bristy Biswas, SO Md. Sahadat Hossain, SO Md. Ashraful Alam, SO Md. Hasanuzzaman, SO



Sl. No	Name of the Seminar/Conference/Workshop/Training	Name of the Participants
2.	In-house training on “X-Ray Diffractometer (XRD)” held on 02-06 January, 2022 at Institute of Glass and Ceramic Research and Testing, BCSIR, Dhaka	Md Sahadat Hossain, SO Md. Ashraful Alam, SO Bristy Biswas, SO (Trainer)
3.	In-house Training on X-ray photoelectron spectroscopy (XPS), IGCRT, BCSIR, Dhaka from 19-23 September, 2021	Dr. Shirin Akter Jahan, PSO Dr. Umme Sarmeen Akhtar SSO Md. Saiful Quddus, SSO (Trainer)



Training program on XRD



Training program on XPS



Seminar/Conference/Workshop/Training

Sl. No	Name of the Seminar/Conference/Workshop/Training	Name of the Participants
4.	In-house training on “E-Governance and Innovation Action Plan” held on 18 May, 2022 at Institute of Food Science and Technology, BCSIR, Dhaka	Md. Farid Ahmed, SO, Bristy Biswas, SO
5.	In-house Training on BET Sorptometer, CARF, BCSIR, Dhaka from 7-11 November, 2021	Juliya Khanam, SSO Sabrina Mostofa, SSO Mandira Saha, SO
7.	In-house training on the Operating and Maintenance of BET Sorptometer. From Nov 05-09, 2021 at CARF, BCSIR	Dr. Umme Sarmeen Akhtar, SSO Md. Saiful Quddus, SSO Md. Hasanuzzaman, SO (Trainer)
8.	In-house Training on “Fatigue Testing Machine and Creep Testing Machine”. From 22-26th May, 2022	Dr. Umme Sarmeen Akhtar, SSO Md. Sagirul Islam, SSO Mohammad Golam Mostofa, SO
9.	International training on “Chemical Security Training for Chemical and Pharmaceutical Industry in Bangladesh” organized by CRDF global (Civilian Research and Development Foundation, U.S. Civilian Rese), March 15-17, 2022	Sabrina Mostofa, SSO
10.	In-house Training on Field Emission Scanning Electron Microscope (FESEM) March 20-24, 2022.	Md. Lutfor Rahman, SSO Sabrina Mostofa, SSO Bristy Biswas, SO Mashrafi Bin Mobarak, SO
11.	In House Training course on “Gas Chromatography-Mass Spectrometry (GC-MS)” held on 13-17 February, 2022 at IFST, BCSIR, Dhaka.	Md. Saiful Quddus, SSO
12.	In House Training course on “Theometer, Microviscometer, Rrefractometer with Density Module” held on 03-07 April, 2022 at BCSIR Dhaka Laboratories.	Md. Saiful Quddus, SSO
13.	In House Training course on “Nuclear Magnetic Resonance Spectrometer” held on 05-09 September, 2021 at INARS, BCSIR, Dhaka.	Mandira Saha, SO Monika Mahmud, SO Md. Hasanuzzaman, SO
14.	In House Training course on “High Performance Liquid Chromatography (HPLC)” held on 14-18 November, 2021 at IFST, BCSIR, Dhaka.	Jannatun Nayeem, SSO Mandira Saha, SO

Seminar/Conference/Workshop/Training

Sl. No	Name of the Seminar/Conference/Workshop/Training	Name of the Participants
15.	In-house Training course on “Wavelength Dispersive X-Ray Fluorescence (WD-XRF)” held on 06-10 March, 2022 at IMMM, BCSIR, Joypurhat	Md. Lutfor Rahman, SSO Mandira Saha, SO Md. Ashraful Alam, SO
16.	In-house training on “X-Ray Diffractometer (XRD)” held on 02-06 January, 2022 at Institute of Glass and Ceramic Research and Testing, BCSIR, Dhaka	Mashrafi Bin Mobarak, SO
17.	78th Training Program of Network of Instrument Technical personnel and User scientists of Bangladesh (NITUB) on the “Use, maintenance and trouble-shooting of Gas Chromatography (GC)” HELD FROM 27-31 March, 2022 at Department of Chemistry, University of Dhaka, Dhaka-1000, Bangladesh	Mandira Saha, SO
18.	In House Training course on “Gas Chromatography-Tandem Mass Spectrometry (GC MS/MS)” held on 21-25 November, 2021 at IFST, BCSIR, Dhaka	Md. Hasanuzzaman, SO Mohammad Golam Mostofa, SO
19.	In-house Training course on “FTIR and UTM instrumentation and application” held on 8-12 May 2022, at LRI, BCSIR	Md. Sahadat Hossain, SO
20.	In-house Training course on “Raman Spectroscopy Analysis” held on 4-8 July 2022, at CARF, BCSIR	Md. Sahadat Hossain, SO
21.	Stakeholder meeting held on 26th January 2022	All The Scientists of IGCRT



Training program on Accreditation



Training program on WDXRF



Thesis Supervision

Sl. No	Name of the Student/ Department/University	Research area	Name of the Supervisors	Status
01.	Md. Rashib Hasan Applied Chemistry and Chemical Engineering, Islamic University, Kushtia	Synthesis and characterization of red iron oxide from iron enriched waste materials	Juliya Khanam, SSO	Completed
02.	Mahdee Muhammad Nafee Department of Chemistry Dhaka University	Synthesis of chemicals admixtures and their uses in OPC	Dr. Umme Sarmeen Akhtar, SSO	Completed
03.	Monmon Poddar Department of Chemistry Comilla University	Synthesis, Characterization and Properties of Nano Cobalt Aluminate for Ceramic Ink	Nahid Sharmin CSO & Director, (Addl. Charge)	On-going
04.	Sumaiya Islam Department of Chemistry Comilla University	Synthesis, Characterization and Properties of Nano Zinc Ferrite and its modified System for Humidity Sensing	Md. Lutfor Rahman, SSO	On-going
05.	Fazle Bari Sagor Department of Chemistry Jahangirnagar University	Adsorptive removal of ciprofloxacin from wastewater by Alginate coated Mg-Al Layered Double Hydroxide	Nahid Sharmin CSO & Director, (Addl. Charge)	Completed
06.	Md. Mijanur Rahman Nahid Department of Chemistry Jahangirnagar University	Synthesis of chloroacetic acid/Mg-Al Layered Double Hydroxide (LDH) nanocomposite and adsorption ciprofloxacin from wastewater Hydroxide (LDH)	Md. Lutfor Rahman, SSO	Completed
07.	Md. Humayun Kabir Department of Chemistry Dhaka University	Synthesis of expanding agent for light-weight concrete or aggregates	Dr. Umme Sarmeen Akhtar, SSO	Completed
08.	Md. Zesanur Rahman Noakhali Science & Technology University	Biochar	Dr. Sonjida Mustafi, PSO	Completed
09.	Niger Sultana Noakhali Science & Technology University	Zeolite synthesis	Md. Saiful Quddus, SSO	Completed
10.	Yasmin Akter Munni Noakhali Science & Technology University	Glass Ceramics	Md. Saiful Quddus, SSO	Completed
11.	Supanna Malek Tuntun	Biomaterial	Dr. Samina Ahmed, CSO	On-going

Students Who Completed/Pursuing PhD/M. Phil

Sl. No	Name of the Student/ Department/University	Research area	Name of the Supervisors	Status
01.	Md. Mehidi Hassan Khan Khulna University of Engineering and Technology	Advance ceramic	Dr. Sonjida Mustafi, PSO	On-going
02.	Nasima Akter Department of Applied Chemistry and Chemical Engineering University of Dhaka	Biomaterials	Dr. Samina Ahmed, CSO	On-going
03.	Md. Farhad Ali Institute of Leather Engineering and Technology University of Dhaka	Environmental friendly composite	Dr. Samina Ahmed, CSO	On-going

MISCELLANEOUS

Name of the Directors and Duration

Sl. No	Name	Duration	
		From	To
01.	Dr. Aftab Uddin Ahmed	20.12.1997	14.04.2002
02	Dr. Md. Tozammel Hossain	15.04.2002	17.04.2003
03	Dr. Sanowar Hossain Mondal	18.04.2003	19.01.2006
04	Dr. Mojibur Rahman	20.01.2006	19.12.2006
05	Mrs. Fahima Rokasana	20.12.2006	31.12.2007
06	Dr. Kazi Nasreen Faruque	01.01.2008	31.01.2011
07	Dr. Husna Parvin Nur	01.02.2011	08.08.2011
08	Mr. Mainul Ahsan	09.08.2011	14.04.2012
09	Dr. Husna Parvin Nur	15.04.2012	20.05.2014
10	Mrs. Mahfuza Khanam	21.05.2014	14.10.2014
11	Dr. Parvin Noor	15.10.2014	09.07.2015
12	Dr. AJM Tahuran Neger	10.07.2015	14.05.2017
13	Dr. Samina Ahmed	15.05.2017	03.07.2018
14	Nahid Sharmin	04.07.2018	04.08.2021
15	Md Habibur Rahman Bhuiyan	05.08.2021	To date

DIFFERENT COMMITTEES OF IGCRT

01. Direct Purchase Committee

01	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Convener
02	Md. Lutfur Rahman, SSO, IGCRT	Member
03	Accounts Officer, IGCRT	Member
04	Concerned Scientists	Member
05	Md. Saiful Quddus, SSO, IGCRT	Member-Secretary

02. Open Tendering Committee (PPR-2008,Act-07,Rule-02)

01	Dr. Sonjida Mustafi, PSO, IGCRT	Convener
02	Sabrina Mustafa, SSO, IGCRT	Member
03	Md. Mamunur Rashid Khan, Administrative Officer (Addl. Charge), IGCRT	Member-Secretary

03. RFQ Committee (PPR-2008, Act-08, Rule-2)

01	Dr. Sonjida Mustafi, PSO, IGCRT	Convener
02	Md. Mustafizur Rahman, Deputy- Director (Audit & Pension)	Member
03	Md. Ashraful Alam, SO, IGCRT	Member-Secretary

04. Tender Evaluation Committee (PPR-2008,Act-08,Rule-2)

01	Director, IGCRT	Convener
02	Dr. Md. Ibrahim Miah, Assistant Professor, Microbiology, DU	Member
03	Dr. Sayka Ahmed, Assistant Professor, Chemistry, DU	Member
04	Dr. Shirin Aktar Jahan, PSO, IGCRT	Member
05	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Member-Secretary

05. E-GP TOC Committee

01	Md. Lutfur Rahman, SSO, IGCRT	Convener
02	Accounts Officer, IGCRT	Member-Secretary

6. E-GP TEC Committee

01	Director, IGCRT	Convener
02	Md. Robiul Islam, Sr. Eng., PP&PDC	Member
03	Md. Lutfur Rahman, SSO, IGCRT	Member-Secretary

07. Technical Sub Committee (PPR-2008,Act-08(14),Rule-02)

01	Md. Saiful Quddus, SSO, IGCRT	Convener
02	Md. Farid Ahmed, SO, IGCRT	Member
03	Mashrafe Bin Mubarak, SO, IGCRT	Member-Secretary

08. Price Evaluation and Specification Preparing Committee

01	Md. Sagirul Islam, SSO, IGCRT	Convener
02	Md. Kamrul Hasan, Assistant Professor, Chemistry, DU	Member
03	Sabrina Mustafa, SSO, IGCRT	Member-Secretary

09. Technical Inspection and Acceptance Committee

01	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Convener
02	Mr. Sarker Kamruzzaman, PSO, PP&PDC, BCSIR, Dhaka	Member
03	Concerned Person/User	Member
04	Store In-Charge, IGCRT	Member
05	Bristy Biswas, SO, IGCRT	Member-Secretary

10. Instruments and Others Repairing Committee

01	Sabrina Mustafa, SSO, IGCRT	Convener
02	Rexona Khanam, SSO, IGCRT	Member
03	Concerned Scientists	Member
04	Mandira Saha, SO, IGCRT	Member-Secretary

11. Vehicles Repairing Committee

01	Md. Lutfur Rahman, SSO, IGCRT	Convener
02	Md. Golam Mostafa, SO, IGCRT	Member
03	Accounts Officer, IGCRT	Member-Secretary

12. Electricity Saving Committee

01	Monika Mahmud, SO, IGCRT	Convener
02	Nigar Sultana Pinky	Member
03	Md. Mamunur Rashid Khan, Administrative Officer (Addl. Charge), IGCRT	Member-Secretary

13. Running R & D projects progress review & Supervision of activities of the training program of Bangladesh Glass and Ceramic Institute's students Committee

01	Dr. Shirin Aktar Jahan, PSO, IGCRT	Convener
02	Md. Hasanuzzaman, SO, IGCRT	Member
03	Monika Mahmud, SO, IGCRT	Member-Secretary

14. Integrity Committee

01	Director, IGCRT	Convener
02	Division In-charge (IPRD, GRD, CRD, RSCRD, CRMCMT, ERD)	Member
03	Md. Saiful Quddus, SSO, IGCRT	Member-Secretary

15. APA Team

01	Director, IGCRT	Team Leader
02	Juliya Khanam, SSO, IGCRT	Member
03	Sabrina Mostafa, SSO, IGCRT and Member-Secretary, Innovation Team, IGCRT	Member
04	Md. Saiful Quddus, SSO, IGCRT and Member-Secretary, Integrity Committee, Member, Citizen Charter and Grievance Redress Officer, IGCRT	Member
05	Mandira Saha, SO, IGCRT and Member, Innovation Team, IGCRT	Member
06	Administration Officer (In-Charge), and Alternative	Member
07	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Focal Point

16. E-Governance/Innovation Team

01	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Convener
02	Mashrafe Bin Mobarak, SO, IGCRT	Member
03	Mandira Saha, SO, IGCRT	Member
04	Md. Mamunur Rashid Khan, Administrative Officer	Member
05	(Addl. Charge), IGCRT Sabrina Mustafa, SSO, IGCRT	Member-Secretary

17. Citizen Charter Committee

01	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Convener
02	Md. Saiful Quddus, SSO, IGCRT	Member
03	Md. Sagirul Islam, SSO, IGCRT	Member-Secretary

18. Grievance Redress Settlement (GRS) Related Focal Point

01	Md. Saiful Quddus, SSO, IGCRT	Grievance Redress Officer
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19. Right to Information Committee

01	Director, IGCRT	Appellate Officer
02	Dr. Umme Sarmeen Akhtar, SSO, IGCRT	Information Officer
03	Administrative Officer (Addl. Charge)	Alternative Information Officer

20. Website Updating Committee

01	Md. Sagirul Islam, SSO, IGCRT	Convener
02	Md. Golam Mostafa, SO, IGCRT	Member
03	Mandira Saha, SO, IGCRT	Member-Secretary

21. Social Welfare Committee

01	Director, IGCRT	Convener
02	Division In-charge (IPRD, CRD, RSCRD)	Member
03	Md. Sharif Hossain Patwary, Accounts Officer	Member-Secretary

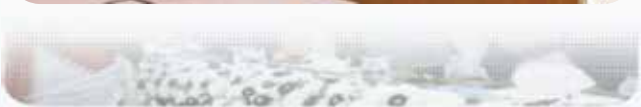
Name of Scientists/Officers/Staffs with Designation Research Wing

Sl No.	Name	Designation
01.	Md Habibur Rahman Bhuiyan	Chief Scientific Officer, Director (In-charge)
02.	Dr. Samina Ahmed	Chief Scientific Officer
03.	Nahid Sharmin	Chief Scientific Officer
04.	Dr. Shirin Akter Jahan	Principal Scientific Officer
05.	Dr. Sonjida Mustafi	Principal Scientific Officer
06.	Mashudur Rahaman	Principal Scientific Officer
07.	Dr. Kanika Mitra	Principal Scientific Officer
08.	Dr. Samia Tabassum	Principal Scientific Officer
09.	Dr. Umme Sarmeen Akhtar	Senior Scientific Officer
10.	Md. Sagirul Islam	Senior Scientific Officer
11.	Juliya Khanam	Senior Scientific Officer
12.	Rexona Khanom	Senior Scientific Officer
13.	Sabrina Mostafa	Senior Scientific Officer
14.	Md. Saiful Quddus	Senior Scientific Officer
15.	Jannatun Nayeem	Senior Scientific Officer
16.	Farzana Khan Rony	Senior Scientific Officer
17.	Md. Lutfur Rahman	Senior Scientific Officer
18.	Farah Nigar	Scientific Officer
19.	Md. Farid Ahmed	Scientific Officer
20.	Md. Ashraful Alam	Scientific Officer
21.	Monika Mahmud	Scientific Officer
22.	Md. Sahadat Hossain	Scientific Officer
23.	Md. Golam Mostafa	Scientific Officer
24.	Mandira Saha	Scientific Officer
25.	Md. Hasanuzzaman	Scientific Officer
26.	Mashrafe Bin Mobarak	Scientific Officer
27.	Nigar Sultana Pinky	Scientific Officer
28.	Bristy Biswas	Scientific Officer
29.	Gourango Roy	Scientific Officer
30.	Roton Kumar	Scientific Officer
31.	Md. Abdullah Al Muhit	Scientific Officer
32.	Moha. Nuruzzaman	Scientific Officer
33.	Md. Yusuf	Scientific Officer
34.	Md. Fahmidul Haque	Research Chemist
35.	Md. Saidul Islam	Senior Glass Blower

SI No.	Name	Designation
36.	Md. Khademul Islam	Junior Technician
37.	Md. Ismail Hossain	Junior Technician
38.	Ahmed Hossain	Junior Technician
39.	Md. Ismail Bhuiyan	Junior Technician
40.	Golam Muhammad	Junior Technician
41.	Md. Abdul haque	Junior Technician
42.	Urmi Akhter	Junior Technician
43.	Robiul Alam	Junior Technician
44.	Md. Yusub Ali	Junior Technician
45.	Sabrina Sultana	Laboratory Attendant
46.	Salma Akhter	Laboratory Attendant
47.	Md. Rajib Ahmed	Laboratory Attendant
48.	Ruhul Amin	Laboratory Attendant
49.	Md. Abdul Kader	Driver
50.	Badal	Cleaner
51.	Shova Rahman	Cleaner
52.	Moyna	Cleaner

Administrative Wing

01.	Md. Mamunur Rashid Khan	TO & Administrative Officer (Addl. Charge)
02.	Md. Sharif Hossain Patwary	Accounts Officer
03.	Md. Masud Karim	Head Assistant
04.	Nasrin Sultana	PA to Director
05.	Farhana Shaon	LDA/Computer operator
06.	Shamim Jamadar	LDA/Computer operator
07.	Mrs. Fouzia Akhter	Office Assistant
08.	Md. Sakhawat Hossain	Office Assistant
09.	Nasrin Sultana	Office Assistant



Stakeholder Meeting

Integrity Award



Md. Lutfor Rahman, Senior Scientific Officer



Golam Muhammad, Junior Technician



Md. Sakhawat Hossain, Office Assistant

Some Remarkable moments

Annual report handover to
honorable Chairman Sir



Industry Visit



PHP float glass industry,
Barabkinda, Chattogram



Karnafuli Paper Mills (KPM)



Standard Ceramic Industries Ltd,
Joydebpur, Gazipur



Ex-Ceramic Industries Limited,
Shreepur, Gazipur



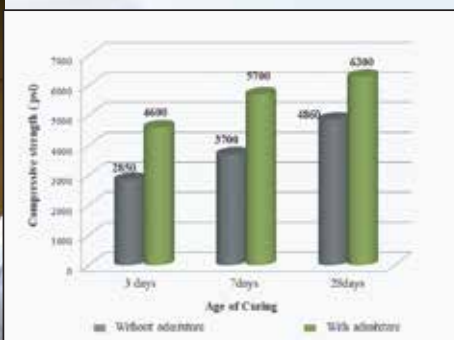
The scientists from IGCRT, BCSIR
visited BTPP on December 22, 2021



Shah cement, Munshiganj, Dhaka

Leased Out Process

Development of Chemical Admixture for Early High-Strength Concrete



M/S:CEMIX Chemical Industries Ltd.



Preparation of super-plasticizer as concrete admixture



Superplasticizer as concrete admixture
— A product of ORD, VOROT, BCSH



M/S SS Properties

Lagshoi Seminar



Long life
Treated
Bamboo

Water
Purification
Filter



Seminar and exhibition on “Application and Expansion of Locally Developed Lagshoi (Appropriate) Technology (Long life treated bamboo and Water Purification filter)” – Organized by the Ministry of Science and Technology, Bangladesh, participated about 30 Upazilas in various districts all over Bangladesh from 2021-2022. To popularize, adoption and dissemination program of appropriate technology of BCSIR to rural mass people.



Editorial Committee



1. Md. Habibur Rahman Bhyuia, CSO & Director (Addl. Charge)	Advisor
2. Dr. Shirin Akter Jahan, PSO	Advisor
3. Dr. Umme Sarmeen Akhtar, SSO	Convener
4. Mandira Saha, SO	Member
5. Md. Sahadat Hossain, SO	Member
6. Md. Hasanuzzaman, SO	Member
7. Nigar Sultana Pinky, SO	Member
8. Bristy Biswas, SO	Member- Secretary

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Institute of Glass and Ceramic Research and Testing (IGCRT)

Bangladesh Council of Scientific and Industrial Research (BCSIR)

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