

the complex tectonics and implications for earthquake hazard assessment. During the field work, attempt was made to estimate the rupture zone of 1950 Great Assam Earthquake through Paleoseismological Methods (Trenching).



The group photo of the International Team



Collection of samples at the trenching site

Exclusive study on Sikkim Earthquake of 2011, Mw 6.9 : The 18 September 2011 Sikkim Himalaya earthquake of Mw 6.9 (focal depth 50 km, NEIC report) with maximum intensity of VII on MM scale (www.usgs.gov) occurred in the Himalayan seismic belt (HSB), to the north of the main central thrust. Neither this thrust nor the plane of detachment envisaged in the HSB model, however, caused this strong devastating earthquake. The Engdahl–Hilst–Buland (EHB) relocated past earthquakes recorded during 1965–2007 and the available global centroid moment tensor) solutions are critically examined to identify the source zone and stress regime of the September 2011 earthquake. The depth section plot of these earthquakes shows that a deeper (10–50 km) vertical fault zone caused the main shock in the Sikkim Himalaya. The NW (North-West) and NE (North-East) trending transverse fault zones cutting across the eastern Himalaya are the source zones of the earthquakes. Stress inversion shows that the region is dominated by horizontal NNW-SSE (North of North-

West-South of South-East) compressional stress and low angle or near horizontal ENE-WSW (East of North-East-West of South-West) tensional stress; this stress regime is conducive for strike-slip faulting earthquakes in Sikkim Himalaya and its vicinity. The Coulomb stress transfer analysis indicates positive values of Coulomb stress change ΔS_f for failure in the intersecting deeper fault zone that produced the four immediate felt aftershocks ($M \geq 4.0$).

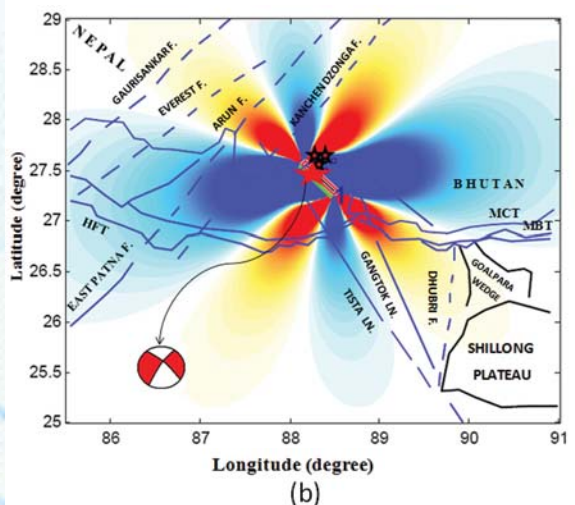
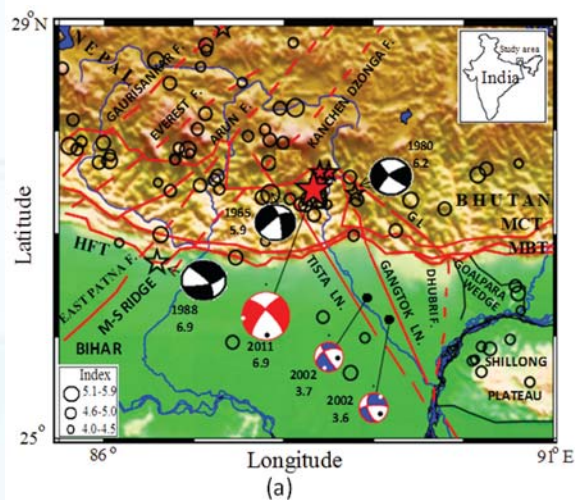


Figure (a) Tectonic map of the Sikkim Himalaya showing the epicentres of EHB relocated earthquakes (1965–2007). The September 18, 2011 main shock and four significant aftershocks ($M > 4.0$) are shown by red stars. (b) Change in Coulomb static stress on optimally oriented strike-slip plane due to slip on the rupture of the September 18, 2011 earthquake Mw 6.9. The hot colors (red) indicate the increase in coulomb stress and the light color (Blue colors) indicate the decrease in stress.

Material Sciences

Materials Sciences Area comprises three divisions, viz., Materials Science, Coal Chemistry and Cellulose Paper & Pulp Division. In these divisions, R & D works are being continued in the areas of (i) nanoparticles, coordination complexes, layered materials, nano material coated membranes etc. for separation and catalysis of organic reactions, (ii) construction materials, (iii) bio-pulping and bio-bleaching for paper, (iv) value added products from lignocellulosic wastes, (v) composite materials, (vi) resource quality assessment of North Eastern coal, (vii) clean coal initiatives etc., which have resulted in technologies, publications, patents, PhDs and also testing, analytical & consultancy services.

A) International Collaboration

Project Title: Synthesis and Reactivity of Nanoporous Metal-Silica Composites – Novel Heterogeneous Catalysts for Selective Oxidation Reactions.

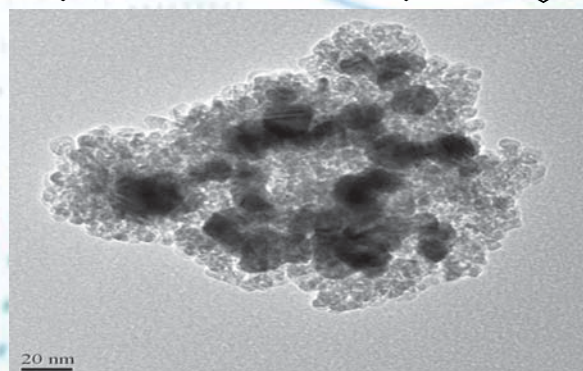
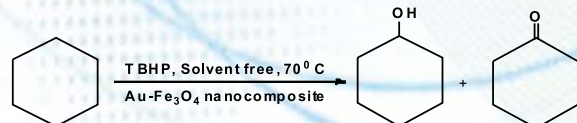
Project No: GPP-287

Funding Agency: DST, New Delhi and Russian Foundation for Basic Research (RFBR)

PI & Members: Dr Lakshi Saikia (Indian-PI), Dr Oxana A Kholdeeva (Russian-PI): Boreskov Institute of Catalysis, Novosibirsk; Russia, Dr. Dipak Kumar Dutta

Salient Achievements:

Synthesis of Au⁰ nanoparticles on Ti containing mesoporous silica and neat nanoporous silica was carried out and its characterization were carried out. The catalytic evaluation for oxidation of cycloalkane has been performed and maximum conversion upto 24 % was achieved.



A) National Collaboration

(i) Network Projects

Project Title: Nanomaterials: Applications and Impact on Safety, Health and Environment (NanoSHE).

Work Component at NEIST, Jorhat: Nanoparticles (Metal and Metal Oxides): Impact on Safety and Environment.

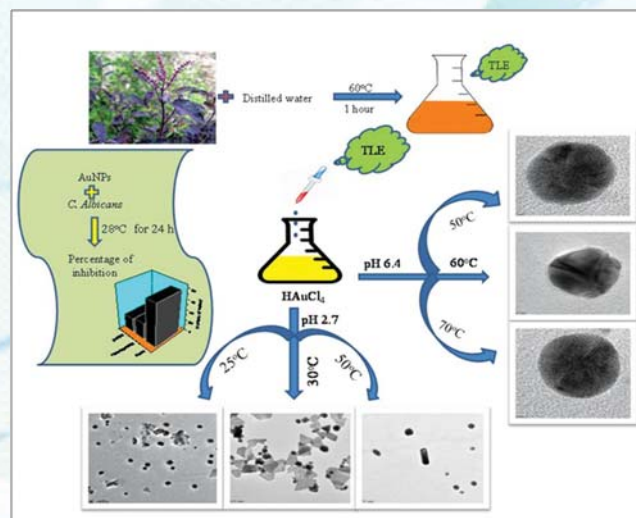
Project No: BSC-112

Funding Agency: CSIR-New Delhi

PI & Members: Dr Dipak Kumar Dutta (PI, Activity-I), Dr Lakshi Saikia, Dr Pinaki Sengupta, Dr Bibek Jyoti Borah, Dr TC Bora, Dr Ratul Saikia, Dr Montu Bhuyan (PI, Activity-II), Dr P R Bhattacharyya

Salient Achievements:

Gold nanoparticles (AuNPs) were synthesized by following the bioprospective route. Aqueous solution of HAuCl₄ was treated with aqueous *Krishna Tulsi* Leaf Extract (TLE) at different condition as depicted. Synthesized AuNPs were further tested for biological activity against different microbes and found activity against *Candida albicans*. Antifungal activity was shown for only triangular pyramidal and spherical (prepared at 50°C) shaped AuNPs and percentage of inhibition was 62.5 and 67.5 % respectively.



Project Title: Zero Emission Research Initiative for solid waste (ZERIS).

Work Component at NEIST, Jorhat: New composite materials for apparel and goods from leather waste of EI shaving, buffing dust and dyed trimmings.

Project No: CSC-103

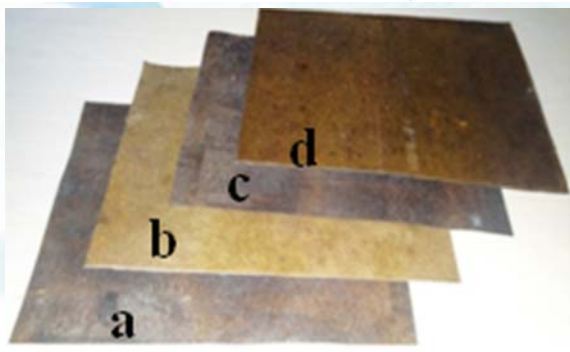
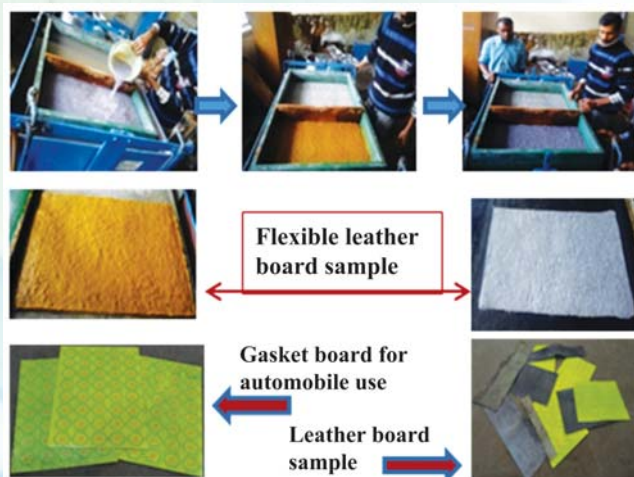
Funding Agency: CSIR, New Delhi

PI & Members: Dr T Goswami (PI), Dr D Kalita, Dr D Dutta, Ms Puspa K Das

Salient Achievements:

Modification of leather wastes (EI saving and dyed trimmings) by chemi-mechanical and enzymatic process and characterized the modified leather wastes. A process for manufacturing flexible board from the blends of natural fibre and dyed trimmings & optimized the process parameter in lab scale. Also, optimized a process for preparation of an emulsion to be used as additives. Developed of some leather substitute products and gasket material from the blends of natural fibre and leather waste material.

Process for manufacturing flexible board from leather waste



a= Natural fibre + dyed trimmings
 b= Pulp fibre +dyed trimmings
 c= Jute fibre board
 d= Natural fibre+ dyed trimmings + EI saving

Sample	Bulk density(cc/gm)	Ash (%)	Moisture (%)	pH	Nitrogen (%)
Buffing dust	5.917	12.95	6.86	4.07	8.24
EI savings	5.649	8.45	8.89	3.29	6.79
Dyed trimmings	3.89	7.45	8.05	2.27	6.62

Physico- chemical properties of leather waste material

Project Title: Nano Oxidic Membrane Reactors by Green Chemical Approach: Membrane and Adsorbent Technology Platform for Effective Separation of Gases and Liquids.

Project No: CSC-104

Funding Agency: CSIR-New Delhi

PI & Members: Dr Rajib L Goswamee (PI), Dr Mrs Aradhana Goswami

Objective:

Design of mixed metal oxide nano sheet based Inorganic Membrane Reactors for environmentally/industrially important applications having following S&T Elements –

- Synthesis of nano oxide dispersions.
- Coating over suitable performs to form thin films having catalytic and membrane properties.
- Design and Fabrication of Catalytic Membrane Reactor for Conversion of CH₄ and N₂O.

Salient Achievements:

Prepared coated ceramic honeycomb catalysts with two different configurations of both open ended channels and closed ended channels. While the open ended honeycombs find application as structured catalyst support for various important environmental and synthetic catalytic applications the honeycomb monoliths with close ended channels closely resembles ceramic membranes. They were coated through MOCVD route with nano oxides of different catalytically active oxides of transition metal ions from metal diketonates of various metals like Cu, Cr and Zn. Shown below in Fig 1 SEM EDXA patterns of such mixed metal diketonates prepared in the laboratory. Also shown in Fig 2 SEM pictures of diketonates of such metals and their corresponding EDXA patterns which were deposited over honeycomb perform supplied by ARCI Hyderabad. Fig 3 gives macro images of both open channel and closed channel coated honeycombs.

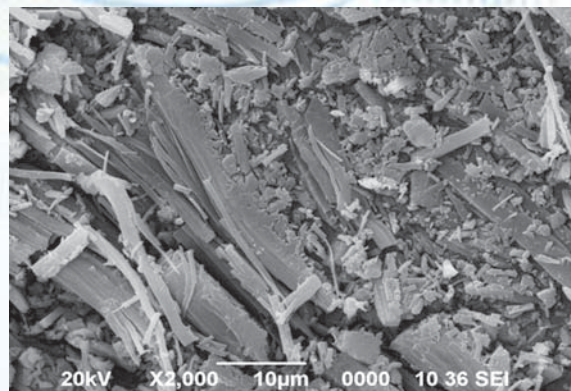


Fig: (A) The SEM image

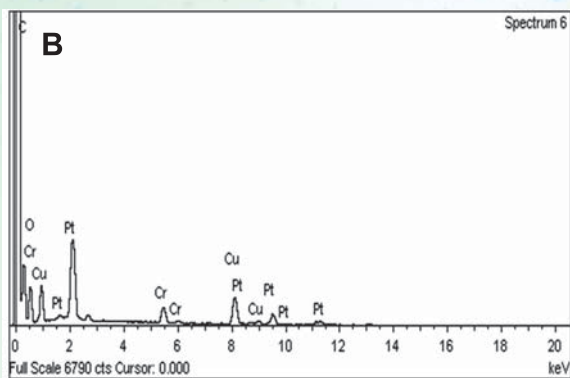


Fig: (B) EDXA pattern of Cu-Cr-Diketonate

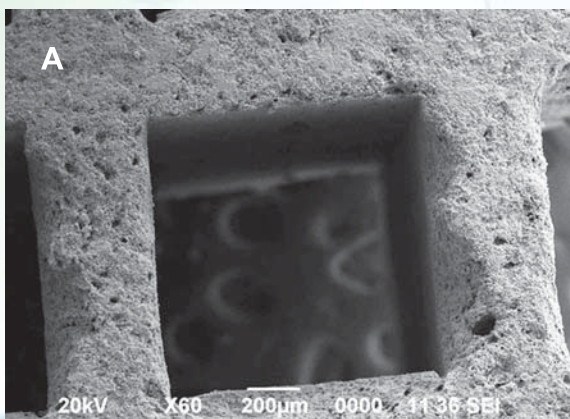


Fig: (A) SEM showing coating of Diketonates over honey comb

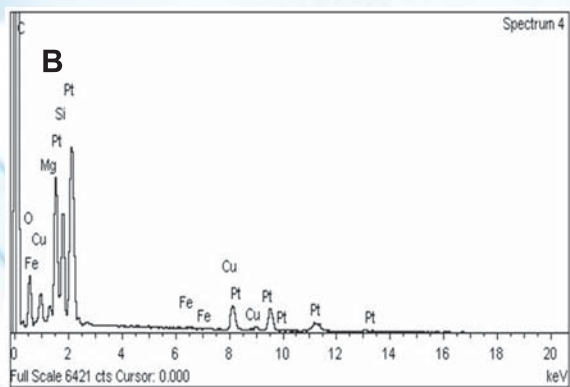


Fig: (B) Corresponding EDXA pattern



Fig: Image of honeycombs of mixed metal Diketonates coated over



Fig: One end blocked Open channel coupons

Project Title: Catalysts for Specialty Chemicals (CSC).

Work Component at NEIST, Jorhat: Nanostructured Materials and Metal Complexes for Efficient Catalysis.

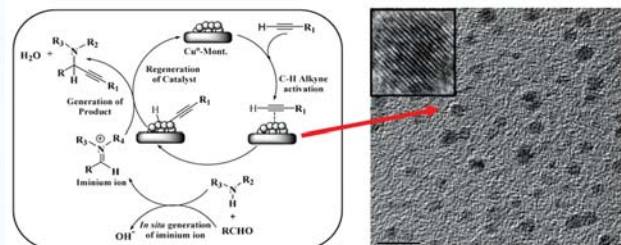
Project No: CSC-125

Funding Agency: CSIR-New Delhi

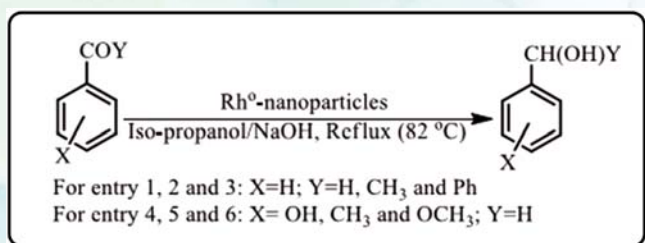
PI & Members: Dr Dipak Kumar Dutta (PI), Dr Dilip Konwar, Dr Lakshi Saikia, Dr Pinaki Sengupta, Dr Bibek Jyoti Borah

Salient Achievements:

Efficient three-component coupling reactions catalyzed by Cu⁰-nanoparticles stabilized on modified montmorillonite clay: Cu⁰-nanoparticles were synthesized into the nanopores of modified montmorillonite and their catalytic performance was tested in three component (A3) coupling reactions of aldehyde, amine and alkyne to synthesize propargylamines. The synthesized Cu⁰-nanoparticles exhibit a face centered cubic (fcc) lattice and serve as an efficient green and heterogeneous catalyst for three-component coupling via C-H alkyne activation to synthesize propargylamines with excellent yields (82-94%) and 100% selectivity under mild reaction conditions.



Stabilized Rh⁰-nanoparticles-Montmorillonite clay composite: Synthesis and catalytic transfer hydrogenation reaction: Rh⁰-nanoparticles of around 5 nm size distributed homogeneously into the nanopores of acid activated montmorillonite clay were synthesized. The synthesized Rh⁰-nanoparticles-clay composites are of below 5 nm size and fully reduced to metallic state. The supported metal nanoparticles serve as efficient heterogeneous catalyst for reduction of some important aromatic carbonyl compounds leading to corresponding alcohols through transfer hydrogenation up to 100% conversion (GC) and selectivity, where isopropanol was used as both solvent and reductant. The catalyst remained active for several runs without significant loss of its catalytic activities.



Project Title (Process part): Metal and metal oxide based nanoparticle assembled on iron oxide and oxy (hydroxide) for water purification.

Project No: CSC-131

Funding Agency: CSIR-New Delhi

PI & Members: Dr Manash Ranjan Das (PI), Dr Sekh Mahiuddin, Mr Tapas Das, Mr Om Prakash Sahu, Ms Archana Yadav

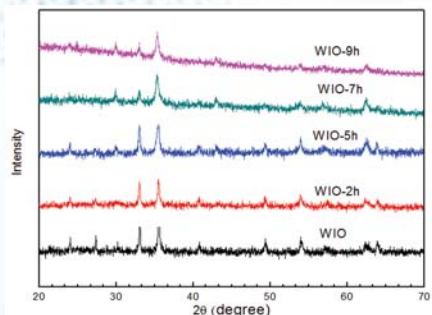
Objective:

- Development of iron oxide nano particles with tailored surface properties for the removal of harmful toxic ions, bacteria and protozoa from water.

Salient Achievements:

Waste iron oxide samples were ground in a planetary mill and the milling time and mill rotational speed were varied. The ground products were then characterized to investigate crystallite size reduction by X-ray diffraction line broadening.

Fig: X-ray difratogram of the waste iron oxide sample



TEM analysis of iron oxide nanopowder synthesized by mechanical ball milling method was carried out to study the morphology, particle size, size distribution, crystalline property of the particles. It was observed that with the increase in milling time, the particles tend to be spherical and smaller in size. TEM images of iron oxide nanopowder namely milling at 2, 5 and 9 h and at 600 rpm are shown below.

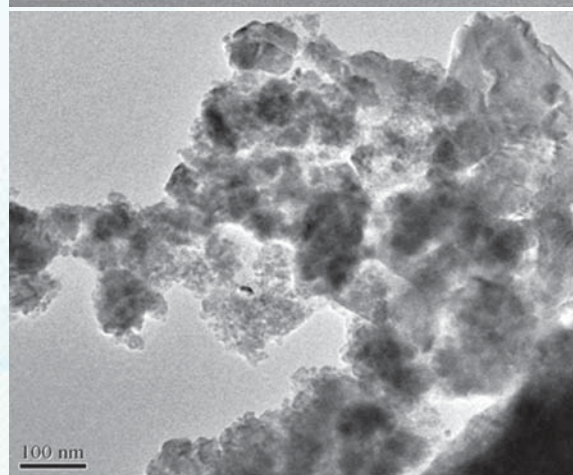
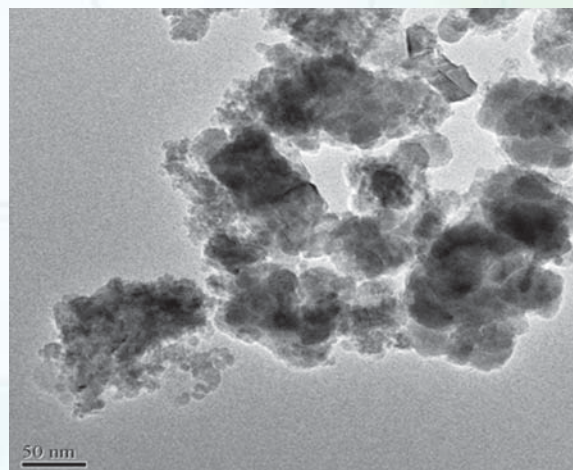
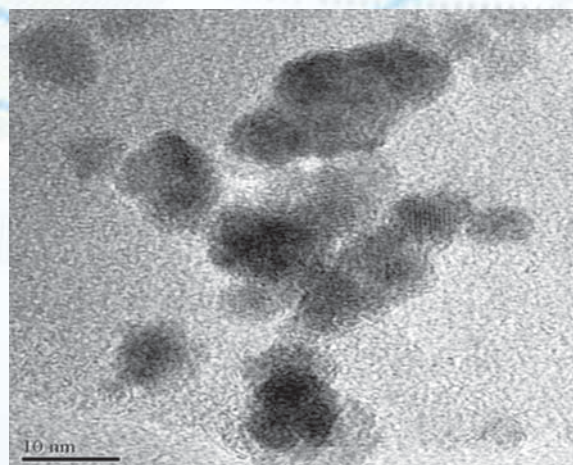


Fig: TEM Images of waste iron oxide at 2h grinding



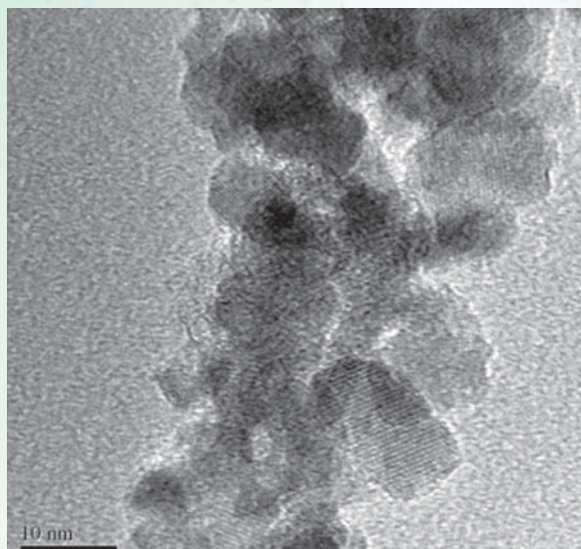


Fig: TEM Images of waste iron oxide at 5h grinding

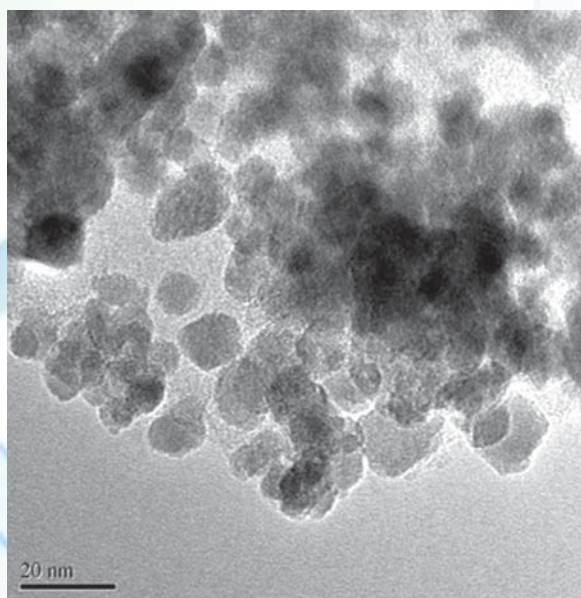
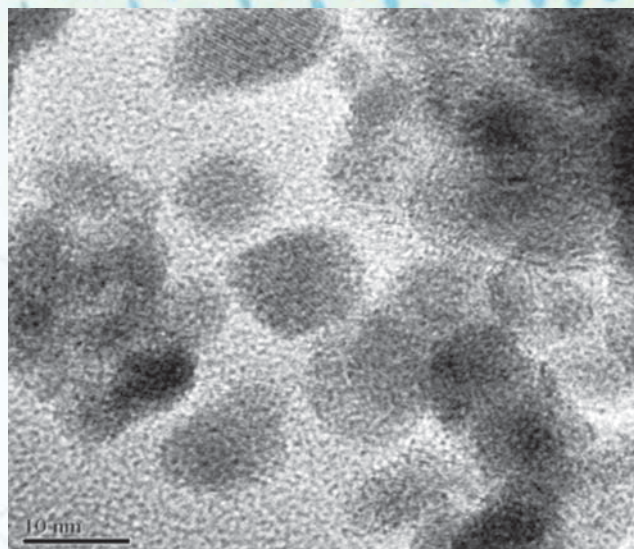
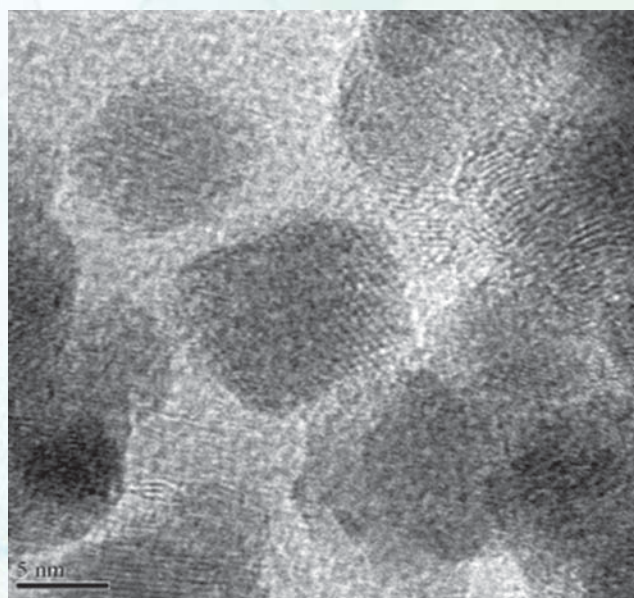


Fig: TEM Images of waste iron oxide at 9h grinding



Photocatalytic degradation of the methyl blue using iron oxide nanopowder in presence of sunlight was investigated. The photodegradation of the methyl blue was studied at different concentration. It is observed that more than 95% degradation of the methyl blue is achieved within 2 h. Fig. shows that the degradation of the methyl blue dye mole against time.

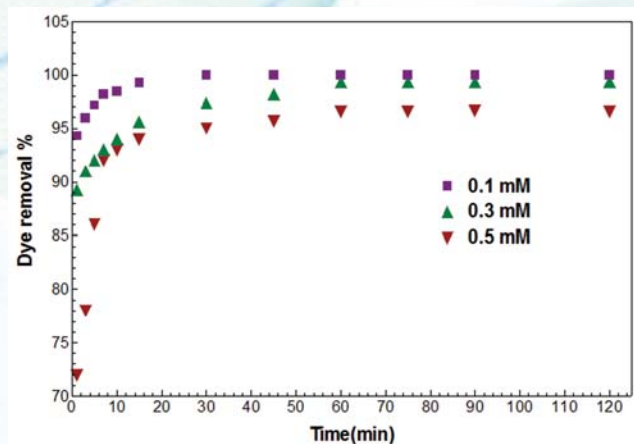


Fig: Percentage of the photocatalytic degradation of methyl blue against time

Project Title: Environmental Research Initiative for Paper and Process Industry (ERIPP).

“Clean technology for pulp processing”- CSIR-NEIST (WP).

Project No: CSC-131

Funding Agency: CSIR, New Delhi

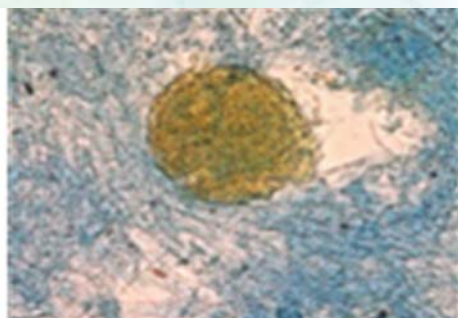
PI & Members: Dr T Goswami (PI), Dr D Kalita, Dr D Dutta, Ms Puspa K Das

Salient Achievements:

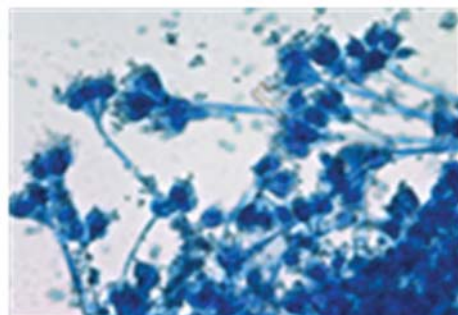
Six lignolytic fungal strains have been identified. Optimization of xylanase & laccase enzyme production from three potential fungal strains. Microbial treatment reduce 50-55 % lignin from bamboo with minimum degradation of cellulose. Also, reduced tensile strength of bamboo by 45-50 %. Microbial treatment reduced 30-40% chemical consumption during pulping also reduced energy consumption during chipping.



Microbial degradation of lignin after 60 days of treatment



Inonotus pachyphloeus

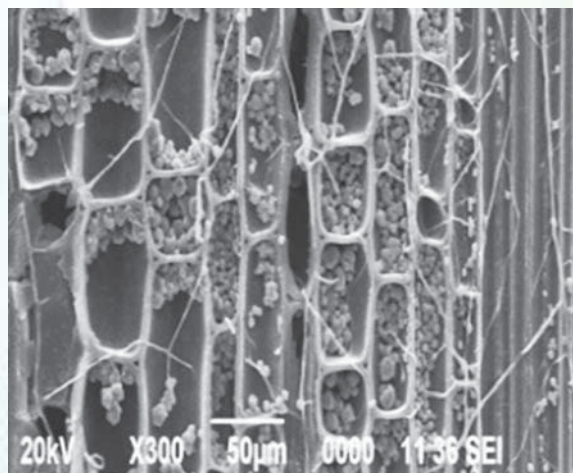


Penicillium meleagrinum

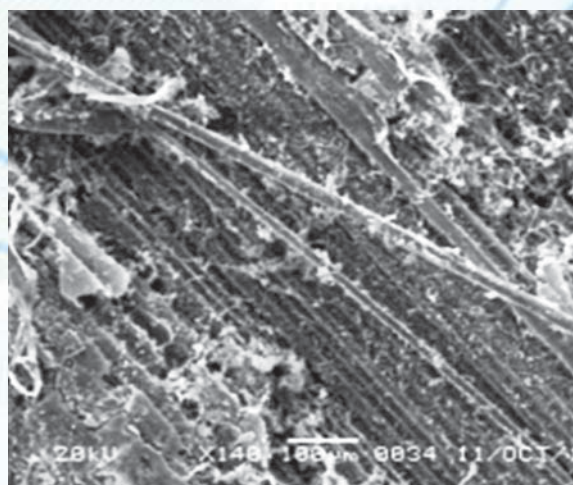


Culture preparation in Bioreactor

Fig: Identified lignolytic fungus



SEM of bamboo after 30days of microbial treatment



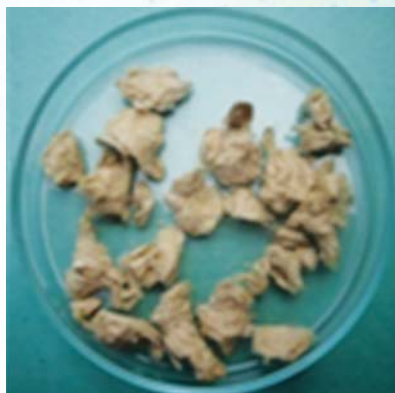
SEM of bamboo after 60days of microbial treatment

Experimental setup on microbial degradation of lignin in bamboo and pulp

Bleached pulp with 70 % brightness



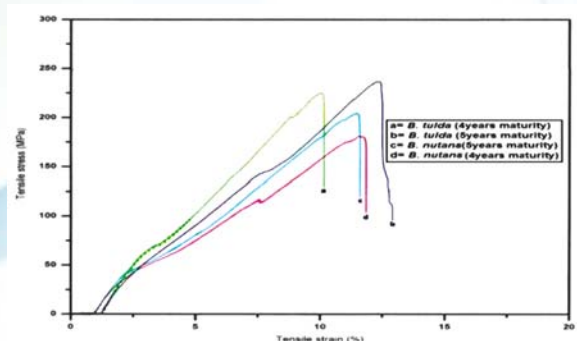
Unbleached pulp



Xylanase treated (4 hrs.) unbleached pulp



Xylanase + H₂O₂ treatment



Ultimate tensile strength of enzyme bamboo

Properties of enzyme treated bamboo

Bamboo sample	Lignin (%)	Cellulose (%)	Tensile strength (N/mm ²)
Control	28.0	64.0	197.51
30 days	23.0	63.1	178.80
45 days	18.5	62.7	161.09
60 days	15.64	59.8	159.62
90 days	12.5	55.5	116.16

ANNUAL REPORT 2014 : 2015

Project Title: Speciality Materials Based On Engineered Clays (SPECS).

Work Component at NEIST, Jorhat:

Development of layered indigenous Montmorillonite clay based composites for adsorption and catalysis.

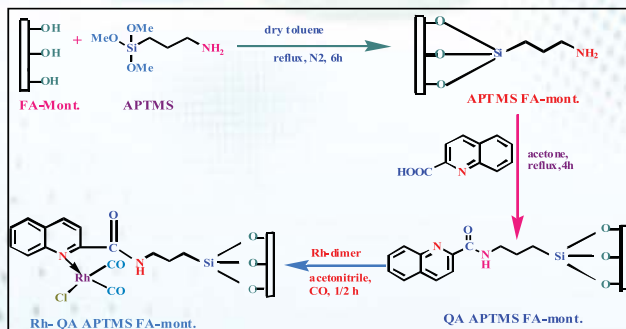
Project No: CSC-135

Funding Agency: CSIR-New Delhi

PI & Members: Dr Dipak Kumar Dutta (PI), Dr Lakshi Saikia, Dr Pinaki Sengupta, Dr Bibek Jyoti Borah

Salient Achievements:

Activated montmorillonite clay immobilized Rh carbonyl catalyst for carbonylation of methanol to acetic acid: A Rhodium based catalytic precursor is prepared through immobilization of [Rh(CO)₂Cl][L] [L = Quinoline-2-carboxylic acid] on the surface of activated montmorillonite clay. The activation of the montmorillonite clay was carried out by formic acid. The catalytic precursor is then used as a catalyst in the carbonylation of methanol which gives a conversion upto 99.9% to acetic acid and also shows a good catalytic efficiency.



Project Title: Probing the Changing Atmosphere and its Impact in Indo-Gangetic Plains (IGP) And Himalayan Regions (Acronym: AIM-IGP-Him).

Project No: PSC-112

Funding Agency: CSIR, New Delhi

PI & Members: Dr P Saikia (PI), Dr B K Saikia (Co-PI), Dr U N Gupta, Mr T Das, Mr Pranjal Handique

Salient Achievements:

Sampling of aerosols and gases was carried out in the background area for winter season 2014, at CSIR-NEIST field. From the investigations, it has been found that concentrations of SPM, PM₁₀ and PM_{2.5} in the ambient air in all the sites were higher than the NAAQS (Figures below). Analysis of the samples collected from the background and coke oven sites has been completed. Concentrations of the Aerosol samples and inorganic gases like SO₂, NO₂ was found higher in Coke oven samples than the background samples.

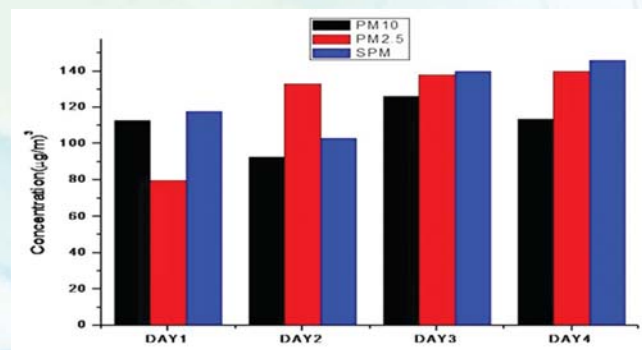


Fig: PM concentrations of background samples

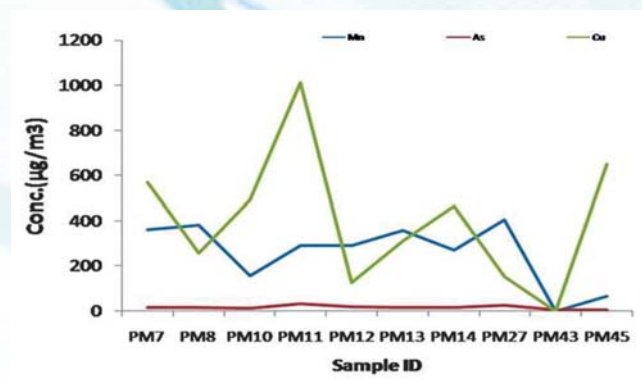


Fig: Concentrations of trace elements in the coke oven particulate matter samples

(ii) In-house, Grant in aid & Consultancy Projects

Project Title: Development of Efficient and Benign Catalysts and Catalysis.

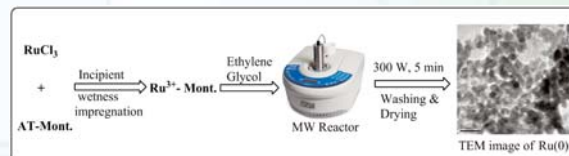
Project No: MLP-6000/1

Funding Agency: CSIR-New Delhi

PI & Members: Dr Dipak Kumar Dutta (PI), Dr Lakshi Saikia, Dr Pinaki Sengupta, Dr Bibek Jyoti Borah

Salient Achievements:

MW assisted Ruthenium nanoparticle synthesis was done by incipient wetness impregnation of aqueous solution of RuCl₃ into the activated montmorillonite support. The composite was reduced by ethylene glycol under microwave power of 300 W at 197 °C for 5 minutes. The synthesized nanoparticles are characterized by powder XRD, TEM and surface area analysis. The TEM image reveals that the sizes of the nanoparticles are below 5 nm.



Project Title: Bacterial adhesion on the metal oxides surfaces.

Project No: MLP-6000/2

Funding Agency: CSIR-New Delhi

PI & Members: Dr Manash Ranjan Das (PI), Dr Sekh Mahiuddin

Salient Achievements:

Adsorption of Gram negative bacteria *Escherichia coli* on to Fe₃O₄ nanopowders was investigated. The surface charge on both bacteria and Fe₃O₄ nanopowders was investigated via Zeta potential measurement at both acidic and basic pH range. From zeta potential studies it was found that both bacteria and Fe₃O₄ nanopowders possess positively charged surface at lower pH's which gradually changes to negatively charged surface at higher pH range. The zeta potential curves for *E. coli* and Fe₃O₄ nanopowders are shown in the figure below:

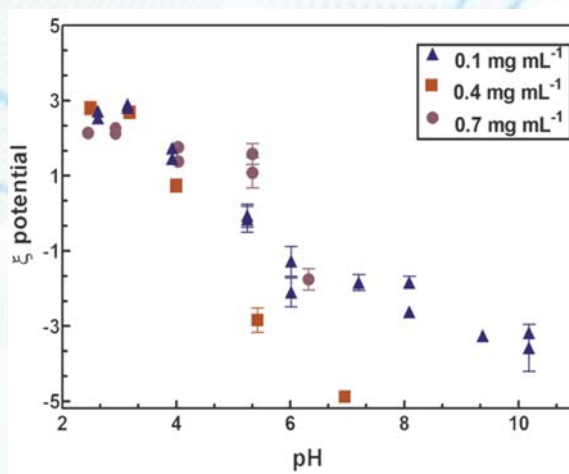


Fig: Zeta potential measurements of *E. coli* at acidic and basic pH

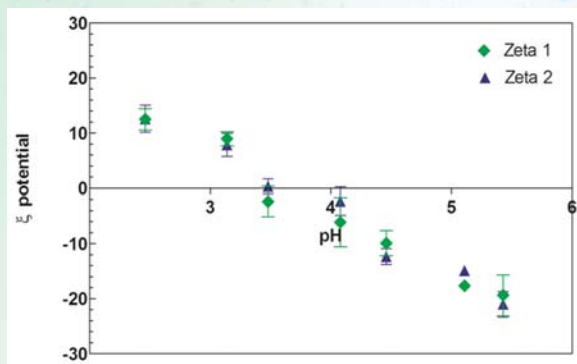


Fig: Zeta potential measurements for magnetite nanopowders at acidic and basic pH

The adsorption of *E. coli* on to Fe_3O_4 nanopowders was investigated at acidic pH (pH 3) and at a concentration of 1g/L for both the adsorbate and adsorbent. 94.86 % adsorption of *E. coli* on to Fe_3O_4 nanopowders was evident at about 60 min. However, desorption was observed immediately after 60 min. The adsorption-desorption curve for *E. coli* on to Fe_3O_4 nanopowders is depicted in the figure below:

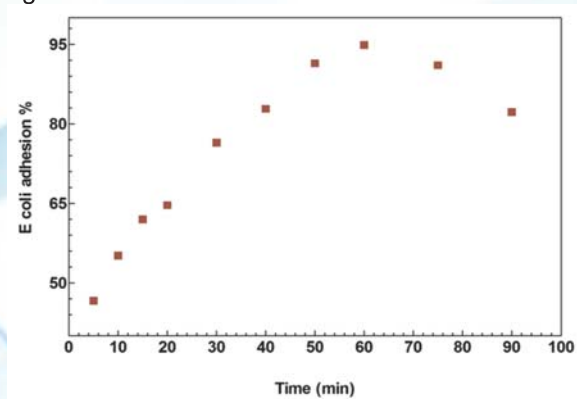


Fig: Adsorption of *E. coli* onto Fe_3O_4 nanopowder

Project Title: Clean Coal Initiatives for North East Indian Coals (WP-III).

Project No: MLP-6000/3

Funding Agency: CSIR

PI & Members: Dr Binoy K Saikia (PI), Dr Upendra N Gupta (Co-PI), Dr Prasenjit Saikia, Mr Tonkeswar Das, Mr Pranjal Handique

Salient Achievements:

Nano-mineralogy and ash geo-chemistry of NER coals and fly ashes: A multi-analytical study: In order to address the scarcity of information on the nature and mode of occurrence of minerals and other inorganic elements in coal, coal mine overburden, and coal ashes from North-East India, and also the relations between coal mineralogy and ash chemistry, petrology, mineralogy, nano-mineralogy, and ash chemistry

of some industrially important high-sulfur coals, coal-mine overburden materials and fly ash samples from Assam (India) have been evaluated. A combined approach has provided new information on the mineralogy and nano-mineralogy of these sub bituminous coals and associated mine overburden.

Rare earth elements (REEs) in NER coals and coal wastes: The presence of rare earth elements and yttrium (REY) in Northeast Indian coal and coal wastes is reported. The identification of these components may be significant from an economic point of view. Some North East Indian fly ashes might be possibly representing sources for recovery of rare earth elements.

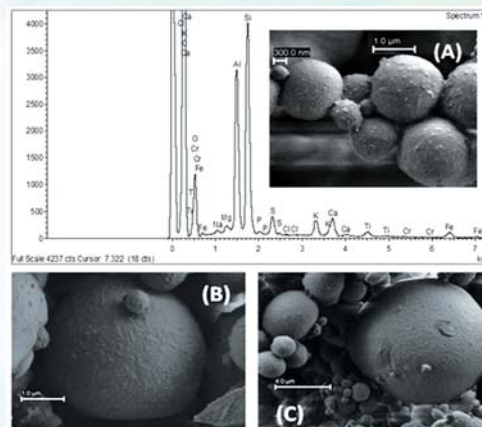


Fig: Typical nano-spheres in coal fly ash

Production and Characterization of Bio-Oil Produced from Ipomoea carnea Bio-Weed: Bio-oil was produced from an undesired bio-weed named *Ipomoea carnea* by thermal pyrolysis. Bio-oil obtained was characterized using various physico-chemical methods viz. TGA, FTIR, NMR (1H , C^{13}), GC-MS, etc. (Figure below). The fuel properties of the oil produced are found comparable to the commercial diesel.

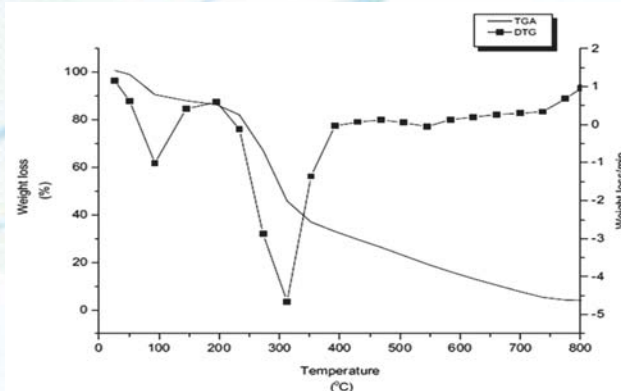


Fig: TG-DTG of *Ipomoea carnea*

Thermo-chemical investigation of NER coals: The ignition temperature, onset temperature, maximum decomposition or degradation temperature and enthalpy at isothermal and non-isothermal condition in nitrogen

and oxygen and CO₂ environment were evaluated from the TGA-DTA analysis (Figure below). Kinetic modelling was established from the TGA-DTA data.

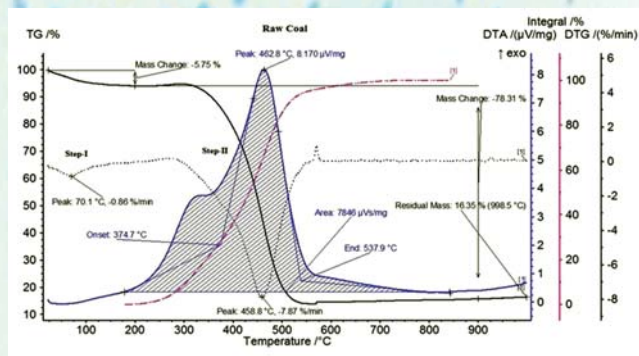


Fig: TGA-DTA analysis of NER coal samples

Agglomeration followed by carbonization of low grade, oxidized and blended coal fines: The Physico-chemical properties of carbonized nodules of NER coals and coal blends are found to be within the limits for industrial and domestic purposes. The process developed will be useful for cement industries, tea-gardens factory and also for other domestic as well as Industrial purposes. The nodules are strong enough to withstand handling and transportation.

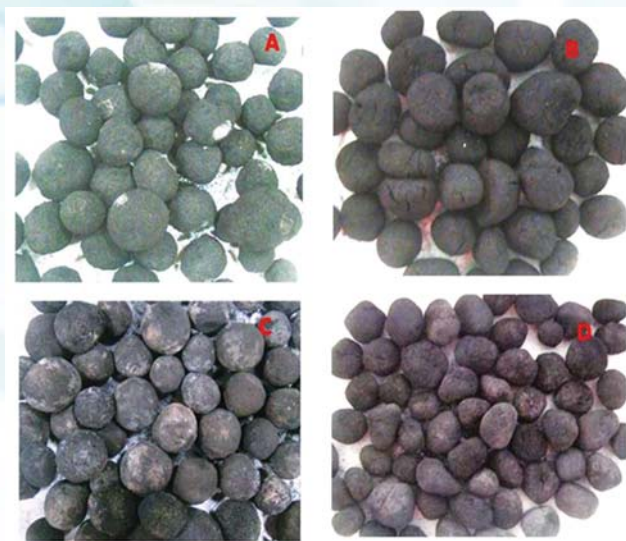


Fig: Green and Carbonized Nodules

Nano-materials from NER coals: Carbon nano-materials are produced from low rank NER coals. The sizes and areas of the carbon nano-balls and carbon nano-tubes are different in sizes and areas. The advanced level characterizations show the formation of carbon nano-materials in the process.

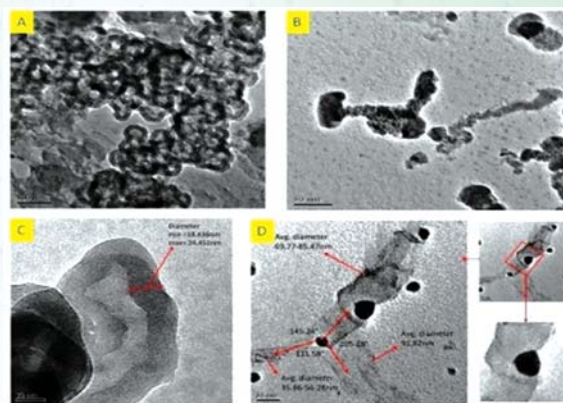


Fig: Carbon nano-materials

Combustion behavior of low rank coals and biomass blend: The combustion behavior of low rank NER coal (Konya) and acacia as a model material was investigated in terms of ignition temperature, ignition index, lower value of sulfur & ash with biomass blending etc.

Mineralogical control of ash fusion temperature (AFT): NER coals are low grade and their gainful utilization in the coal based industries needs to be assessed in terms of ash fusion temperature. Various oxides such as Fe₂O₃, Al₂O₃ etc. affect the AFT and hence the mineralogical effect of such coals on AFT during their combustion was studied along with the effect of adding additives which can enhance the AFT.

Project Title: Sustainable development of high valued products and processes from lignocellulosic bio resources of North East India.

Project No: MLP- 6000/04

Funding Agency: CSIR, New Delhi

PI & Members: Dr T Goswami (PI), Dr D Kalita (Co-PI), Dr D Dutta, Ms Puspa K Das

Salient Achievements:

Optimized a process of fibre extraction from three wild plants of Assam, eg. *Crotalaria juncea*, *Sterculia vilosa* (bark) and *Cannabis sativa* and developed technology for making handmade paper and suitable grades of pulp from these pulp materials. A bio formulation was developed for treatment of bamboo and wood product. A process for manufacturing solid deodorant for surface cleaning was developed in lab scale.



Wood samples affected by borer-insect along with treated sample

Wood Care formulation

Solid deodorant

Project Title: Development of feasibility assessment model for adaptation of underground coal gasification technology in the North-East Region of India.

Project No: GAP-261

Funding Agency: Ministry of Communication and Information Technology

PI & Members: Dr Prasenjit Saikia (PI), Dr Binoy K Saikia (Co-PI), Dr UN Gupta, Mr T Das

Salient Achievements:

The role of additives on Ash fusion temperature has been done to know process conditions of NER coals for gasification. The low temperature carbonization of Tipong coal sample at various temperatures (350°C, 450°C, and 600°C, 750°C) to study gas composition and gas concentration has also been carried out. A feasibility study on CO₂ gasification of NER coals has also been initiated Thermogravimetrically (TGA-DTA).



Fig: Integrated coal-based Gasifier system

Role of Additives on Ash Fusion Temperature (AFT): The Tertiary Indian coals have the low AFT range for which they cannot be directly utilized in the conventional combustion and gasification systems. In order to improve the AFT, an attempt has been made by adding Al₂O₃ as an additive instead of SiO₂ and TiO₂ as its effect on AFT is more in comparison to the other two. **Silica-to-alumina ratio** is the most important factor associated with coal ash melting properties. Figure shows the effect of SiO₂/Al₂O₃ on experimental IDT on addition of different weight (%) of Al₂O₃. The low SiO₂/Al₂O₃ ratios of the coal samples indicate that due to the presence of high Al₂O₃ content, its ionic crystal and high melting point increases the IDT.

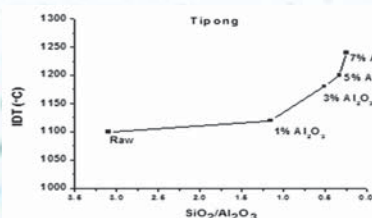


Fig: Role of Additives on AFT

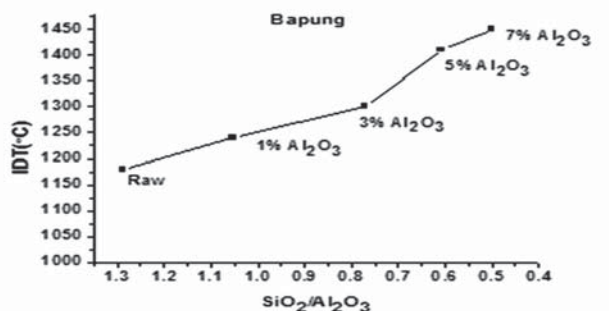
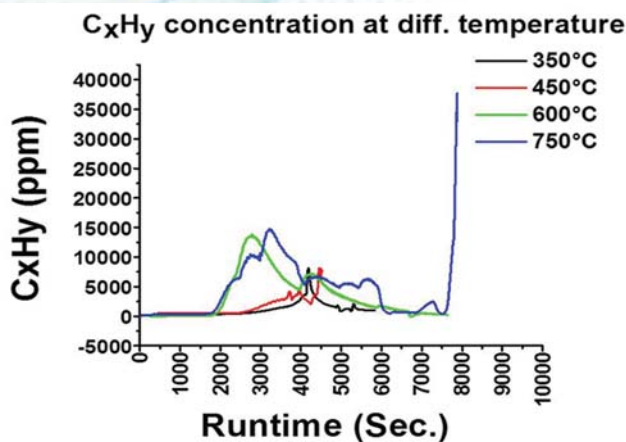
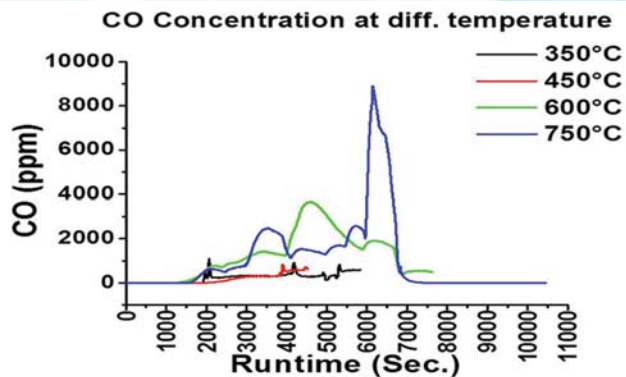
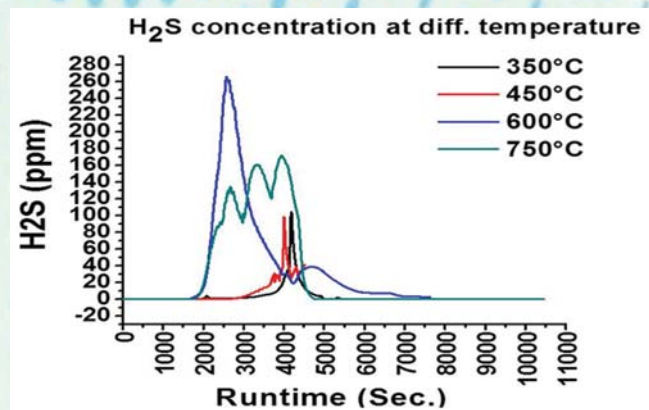


Fig: Role of Additives on AFT

The slagging and fouling potentials of Tipong and Bapung coals decrease with the increase of the weight (%) of Al₂O₃. The low fouling and slagging potentials of the coal samples indicates their feasibility for gasification process. The presence of high sulphur in Tipong and Bapung coal samples is another factor which plays an important role in slag formation.

Gas composition during pyrolysis at different temperatures: Pyrolysis is an intermediate reaction stage in the coal gasification process. During pyrolysis, typical sub-bituminous coals lose about 40-50% of their dry weight, generating a large number of various products such as low-molecular weight gases, light hydrocarbons and heavy tars (Figures below). Since a large percentage of the coal is removed during pyrolysis, this process must be well understood if one is to model the gasification process properly.





Project Title: Hierarchical Porous Solid as Catalyst and Catalytic Support.

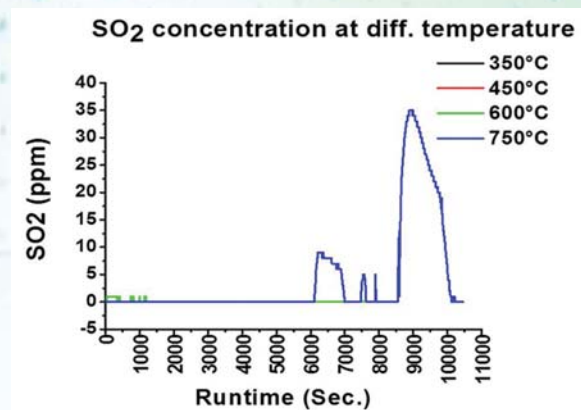
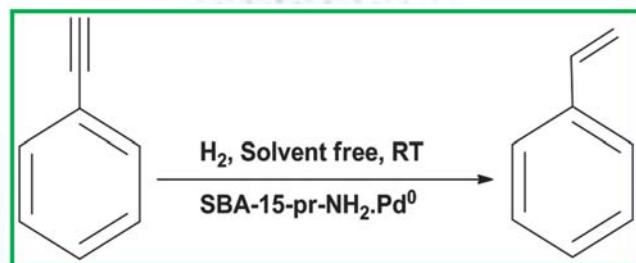
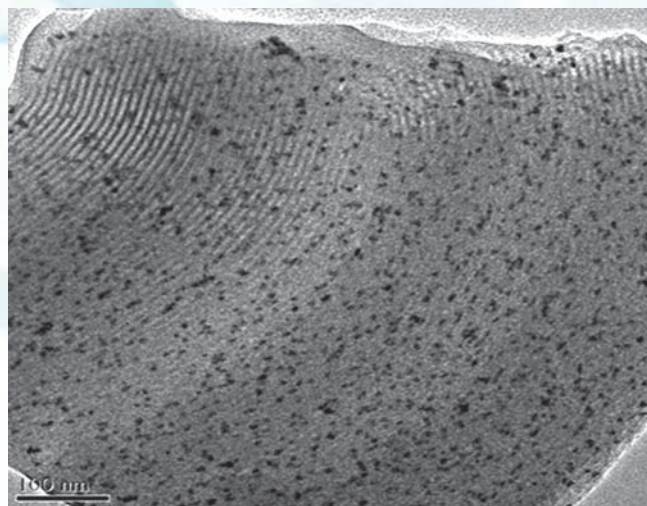
Project No: GPP-267

Funding Agency: Department of Science and Technology, New Delhi

PI & Members: Dr Lakshi Saikia (PI)

Salient Achievements:

Palladium nanoparticles are synthesized on propylamine functionalized SBA-15 support employing an eco-friendly facile method. The synthesized Pd⁰ nanoparticles are characterized using XRD, N₂ adsorption-desorption isotherm, TEM, XPS etc. analysis. The as-synthesized SBA-15-pr-NH₂.Pd⁰ nano hybrid exhibited excellent catalytic activity for semihydrogenation of phenyl acetylene to styrene.



Project Title: Solution Chemistry Approach for Synthesis of Metal Nanoparticles on the Graphene Oxide/Graphene Nanosheets.

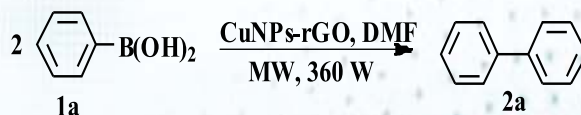
Project No: GPP-269

Funding Agency: Department of Science and Technology, New Delhi

PI & Members: Dr Manash Ranjan Das (PI)

Salient Achievements:

The stable Cu(0) nanoparticles on reduced graphene oxide nanosheets (CuNPs-rGO) was synthesized by simple, green and very cost effective method. The oxidation resistance of the Cu(0) nanoparticles-rGO composite was investigated by exposure to air under ambient conditions for more than two months, and found no other oxidation state. Copper acetate monohydrate was used as a salt and ascorbic acid was used as a reducing agent. The synthesized CuNPs-rGO composite was characterized by various techniques such as IR, XRD, XPS, TGA and TEM. Also the prepared CuNPs-rGO composite was utilized as one of very efficient catalyst for the homocoupling of phenylboronic acid. The reaction conditions are notably compatible with a range of functional groups such as methyl, aldehyde, ether, nitro on the aryl ring. The catalyst is reusable upto five times without loss of its significant activity and the surface and morphology of the catalyst remains same even after performing the reaction.



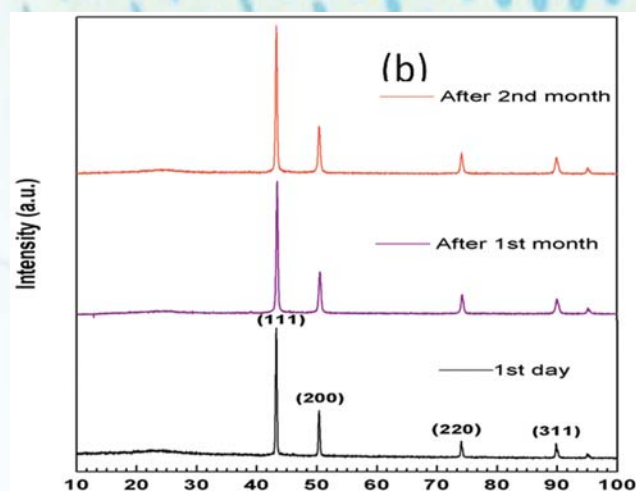
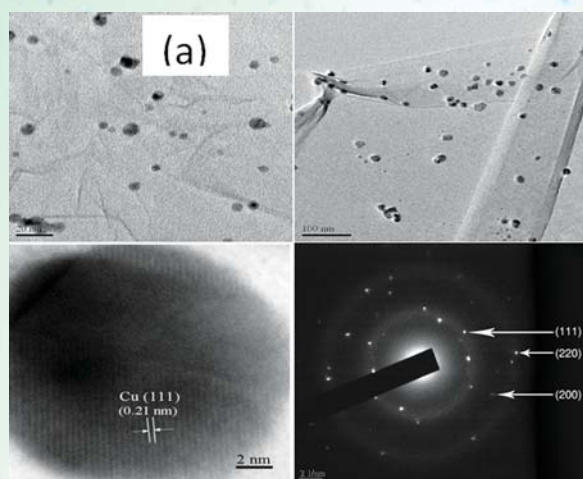


Fig: HRTEM images of Cu(0) nanoparticle (a) and XRD pattern of Cu(0) nanoparticle (b) on reduced graphene oxide nanosheets

Project Title: Potential Rhodium complexes of functionalised phosphines and nitrogen donor ligands: synthesis, reactivity and catalytic carbonylation of alcohols.

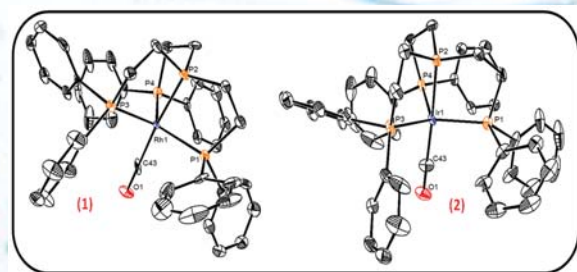
Project No: GPP-278

Funding Agency: Department of Science and Technology, New Delhi

PI & Members: Dr Dipak Kumar Dutta (PI)

Salient Achievements:

Cationic carbonyl complexes of Rhodium and Iridium for catalytic Hydroformylation: Cationic carbonyl complexes of the type $[M(CO)L]Cl$ (**1**, **2**) [$M = Rh$ (**1**), Ir (**2**); $L = P(CH_2CH_2PPh_2)_3$] have been synthesized and characterized by various spectroscopic techniques including the single crystal X-ray diffraction (Structure shown below). The complexes crystallize in trigonal bipyramidal symmetry with the metal at the centre. Both the complexes were found to be good catalysts for the hydroformylation reaction under the experimental conditions 35 ± 2 bar, 80 ± 2 °C, 500 rpm, 5-8 h



Project Title: Small Community Level Low Cost Process From Local Biomass For Iron And Fluoride Removal From Bore Well Water Of Assam.

Project No: GPP-296

Funding Agency: Department of Science and Technology, New Delhi

PI & Members: Dr R L Goswamee (PI)

Objective:

- Development of a process for a small community of 2 to 3 families for defluoridation and Iron removal from bore well water of affected regions of Assam using locally available cheap bio-materials viz. Chemically activated Paddy husk ash and carbonised *Ipomoea Carnea* as an active component for filtering media.
- Introduction of novelty in toxic sludge handling through economic lime-silica reactions.
- Integration of affected people through NGO, State Public Health Engineering department, MSME industry in the technology development process in a spirit of shared responsibilities and mutual collaboration.

Salient Achievements:

Process flow sheet preparation, preparation of different adsorbent media from locally available bio materials, their chemical modification and surface functionalisation, activation of the adsorbents by laboratory prepared soluble polymeric alumina, Pelletisation of composite adsorbent prepared by using different local materials and defluoridation study, study of permanent immobilization of spent adsorbents by

hydrolytic lime-adsorbent reaction and study of consequent compressive strength developments and mineralisation were done.

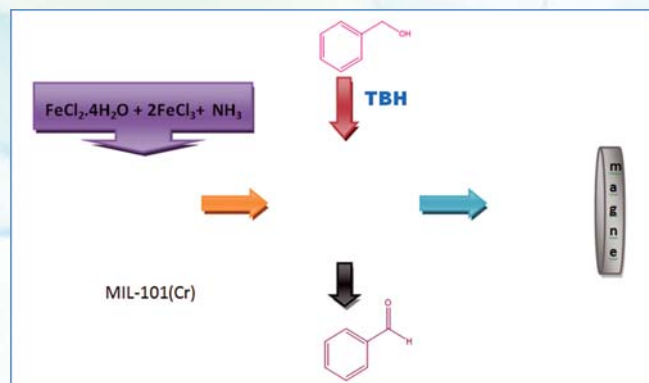


Fig: Ceramic pellets for defluoridisation made from local materials

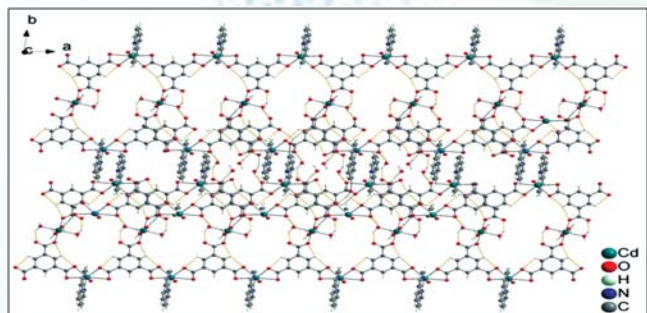
Basic Research:

Metal Organic Framework for Catalytic Application:

Metal Organic Framework of very high surface area MIL-101 was prepared and in-situ generation of magnetite nanoparticles on MIL-101 was done. The composite material was characterized using various physico-chemical and spectroscopic techniques. This $Fe_3O_4@MIL-101$ magnetite nanocomposite which behaves as a magnetic nanocatalyst for the solvent free oxidation of benzyl alcohol in presence of TBHP. The composite material is magnetically separable and reusable for several times.

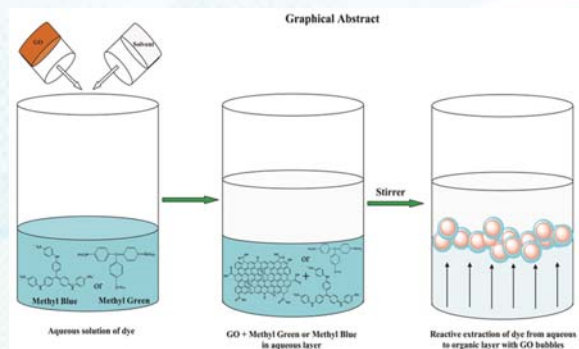


Porous coordination polymer of Cd: Supramolecular assembly of Cd synthesized by solvothermal method using DMF-water mixture as solvent. The formation and purity was confirmed initially by FT-IR and elemental analysis. The single crystal structural analysis was performed (see figure below) and found to have presence of H-bond interactions and framework structure. The material exhibited very good luminescent property



Graphene Oxide Nanosheets at Water – Organic Solvent Interface: Application in Reactive Extraction of Dye Molecules:

The graphene oxide (GO) nanosheets play an important role in bubbles formation at water-organic solvent interfaces. The bubbles formation at water-organic solvent interfaces was investigated with different organic solvents. The bubble formation and transfer of GO from water to organic phase is more prominent in aromatic solvent compared to aliphatic solvent. A very high amount of dye extraction was achieved due to electrostatic and $\pi-\pi$ interaction between the dye molecules and GO nanosheets. Maximum transfer of GO from aqueous to organic phase was achieved at pH 2 which decreases with increase in pH of the aqueous phase. Based on this property and ability of GO to adsorb cationic and anionic dye molecules, its application as carrier in reactive extraction of cationic and anionic dye molecules was explored in toluene, kerosene and carbon tetrachloride at pH 2 and 25 °C. The electrostatic interaction and $\pi-\pi$ interaction between the dye molecules and GO nanosheets leads to dye extraction up to 98.2% by this technique. The dye extraction was found to be maximum in toluene and at low dye concentration.



Gold-Palladium core shell nanostructure on the graphene nanosheets:

The core-shell bimetallic Au@Pd-reduced graphene oxide composite material was synthesized via a one step chemical reduction technique employing an eco-friendly reducing agent and stabilizing agent. The synthesized composite material is characterized by an XRD analysis, TEM & HRTEM images, FTIR spectroscopy, TGA etc. Further, the composite material is investigated towards environmental remediation of organic pollutants.

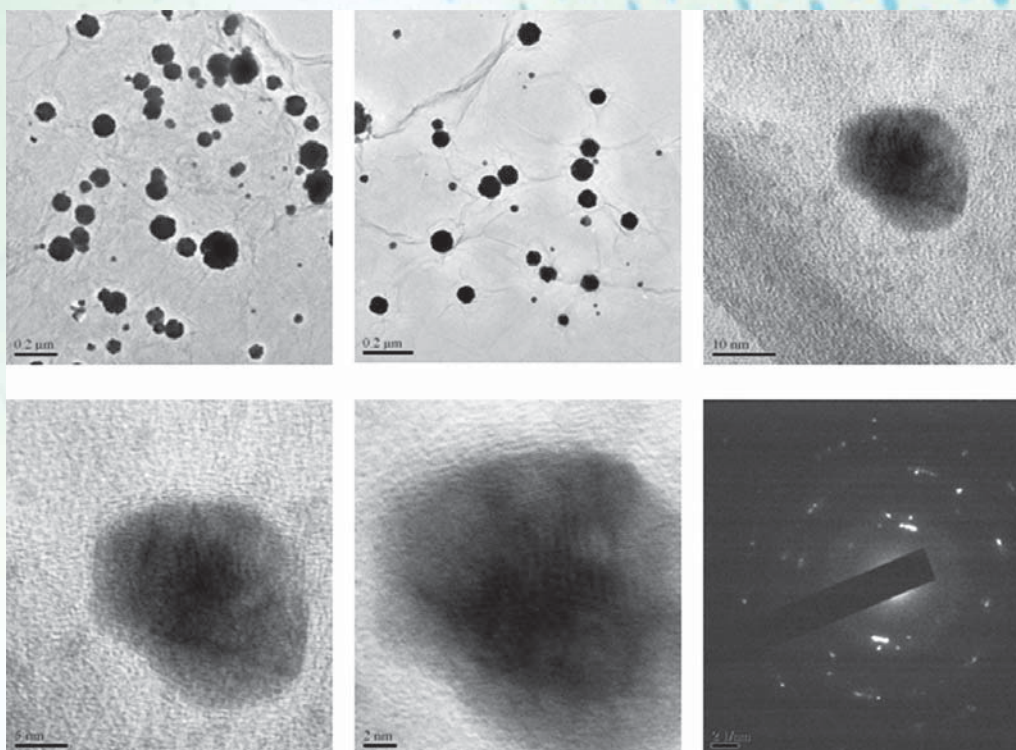


Fig: TEM images of Au@Pd core shell structures

Management Sciences

The Management Sciences consist of three major divisions mainly Human Resource Development, Information & Business Development and Planning & Project Monitoring. Each Division is having individual activities to support the R&D communities of the institute as well as to support the Director and administration.

In addition to that the Knowledge Resource Centre (KRC) and Information Communication technology division also provide significant and regular support to the Director and administration.

Human Resource Development

The Human Resource Development (HRD) Division provides human resources and knowledge management solutions of the institute to realize the R&D output. To enhance the competencies of existing human resources of the institute the division imparts the training in and outside the country, organizes workshops / lecture seminars, etc. The division imparts training and motivates students of the NE region in particular and the country in general. The division undertakes extensive recordkeeping of the employee and researchers, competency development through need based training, strive for collaborative projects, etc.

Research Workers / Project Fellow:

The division encourages young talent for joining in the fellowships under various national and international schemes of CSIR and other funding bodies to carry out basic research in frontier areas of science from the country and from abroad. Presently, a few of them are working in various capacity under such schemes viz., Women Scientist Scheme (WSS) of DST, Senior Research Fellow and Junior Research Fellow of CSIR, UGC and other funding bodies, DST Inspire fellow, CSIR-TWAS Fellow and Centre for International Co-operation in Science (CICS)'s Research Training Fellowships

for Developing Country Scientists (RTFDCS). The division also arranges to engage a few lecturers / teachers of nearby colleges and other Institutes as Guest Workers for their research work leading to PhD. The number of such research workers under various capacity during the periods are enlisted viz., 21 Senior Research Fellow, 5 Junior Research Fellow, 01 Research Associates (RA), 01 Young Scientist Scheme (YSS), 01 Principal Investigator, DST Women Scientist Scheme, 03 CSIR-TWAS Fellow, 08 DST Inspire fellow, 01 Teachers Fellow and 01 JNCASR-ROCASA, 174 Project workers. Based on review of their progress of research work a few of them were registered to pursue Ph D degree from Dibrugarh University, Gauhati University, Assam University and our own *Academy of Scientific and Innovative Research* (AcSIR).

A) National Collaboration

(i) In-house, Grant in aid & Consultancy Projects

Project No: MLP- 7000

Project Title: Programme to AuGment & reJjuvenate Youth through Training for economic, Social & Holistic development (PRAGJYOTISH).

Funding Agency: In-house

PI & Members: Ms Kuin Baruah (PI), Mr JJ Mahanta, Mr P Paul

Objective:

- To motivate SC / ST students of NE states with cash incentive mechanism for taking up science as career.
- To organize multi-theme and multi-level training programme like: summer training, industrial training, practical training, dissertation, etc. for selected students of different universities, colleges and institutes of the country.
- To organize skill development technical training programme for educated youths of the state under Apprentice scheme of Govt of India.
- To motivate students and teachers of the NE region and organization of workshop in the emerging areas of science under the programme: "Faculty Training and Motivation and Adoption of School and Colleges by CSIR labs".
- To carry out induction and management of students under Doctoral programme of the *Academy of Scientific and Innovative Research* (AcSIR) and their periodic assessments.
- Engagement, management and assessment of research and project workers under external funded projects and CSIR projects.

Salient Achievements:

6 nos. of students participated in SC / ST Award, 17 nos. of Trade Apprentice were trained, 01 no. of Graduate Apprentice was trained, 173 nos. of External Students were trained, 174 nos. of Project Fellow, 21 nos. of SRF, 5 nos. of JRF, 01 no. of Research Associates (RA), 01 no. of Scientist under Young Scientist Scheme (YSS), 01 no. of Scientist under DST Women Scientist Scheme as Principal Investigator, 03 nos. of CSIR-TWAS Fellow, 08 nos. of DST Inspire fellow, 01 no. of Teachers Fellow and 01 no. of JNCASR-ROCASA were selected and joined CSIR-NEIST to carry out research under above mentioned schemes.

R&D Support Activities (Management Sciences & KRC)

Research Council:

The division carried out different activities of the Research Council (RC) of the Institute as RC Secretariat. During the period the approved minutes of the 48th RC meeting was sent to CSIR Hqs. The 48th RC meeting was organized at CSIR-NEIST, Jorhat during July 21-23, 2015. After, October 31, 2014 the RC Secretariat shifted from HRD Division to Dr S Baruah, Sr. Principal Scientist, Geoscience Division.

Academy of Scientific and Innovative Research (AcSIR): The division is the functionary unit of AcSIR in the Institute and has formulated and structured the activities of AcSIR. During the period, twenty four (24) new students enrolled under different Research Fellowship schemes for Ph D courses and one student was awarded Ph D degree.

Database Management:

The division maintains different databases on manpower of the institute viz., foreign visit of scientists, research workers, Ph D recipients, manpower, apprentice trainees, etc. The division provides information of Group IV scientist to RAB, to CSIR, visits of scientist abroad to ISTAD, CSIR.

Infrastructure Management:

The division manages different activities of the Boys' hostels, of the institute.

Project/dissertation to students (HRD division)

The division arranges facilities for multi-theme and multi-level training programme viz., summer training, industrial training, practical training, dissertation, etc. for the selected students from different universities, colleges and institutes of the country up to a maximum period of six months. During the period a total of One Hundred and Seventy Three (173) students had actually undertaken the training programme / project work from various institutes of the country.

Information & Business Development

Information & Business Development (I&BD) division continues to serve as the window of the Institute to the outside world and coordinated the overall business development activities of the Institute. The division continued to maintain the liaison activities, both public & industrial houses, entrepreneurs etc who were in need of assistance from the institute and also disseminated the expertise and capabilities of the Institute through various means for economic, societal and other benefits of the clients, customers and users.

Exhibitions/workshop organised:

The Information & Business Development (I&BD) division disseminated the institutional technologies through different exhibitions, through its products/posters etc. and invitation by the entrepreneurs in various occasion. The division also organised workshops/seminar etc.

Organised Students Visits:

Gyanjatra and Gyanjyoti programme:

During the year more than 3500 students from all over districts of Assam visited CSIR-NEIST under the Chief Ministers Gyanjyoti Programme, Govt. of Assam and more than 3000 Students under Gyanjatra programme frame by Inspector of Schools Jorhat, Golaghat and Sibsagar district.

Moreover Students from different Universities, Colleges, Technical Institutes, & Schools of North Eastern Region visited CSIR-NEIST along with the guide teachers as a educational tour.



Mr Probin Baruah, PTO briefing the activities of CSIR-NEIST to the student visitors.

Publications:

During the period the division brought out the following regular and need based publications on different occasions.

- **Annual Report 2013-14** - Annual report of the institute was brought out and released on the 72nd CSIR Foundation Day celebration on 26 September 2014
- **Highlights 2014-2015** - Highlights 2014-15 of the institute (which is compilation of institutes activities) was brought out and released on the CSIR-NEIST Foundation Day celebration on 18 March 2015
- **NEIST News** (Bimonthly newsletter)
- **INFOWATCH** (In-house Weekly)



CSIR-NEIST Publications at a glance

Patents filing:

The division is responsible for processing of the institutes patent application for filing in India and abroad and for this is continuously coordinating with IPU, CSIR, New Delhi.

Processing of New Project Proposal:

The division is also responsible for processing of new project proposals. The proposals so received are forwarded to the respective committee for scrutiny.

Technology Transfer:

The division is responsible for the commercialization of the technologies developed by CSIR-NEIST. It is responsible for drafting of technology/knowhow transfer agreement and acts as bridge between the entrepreneur and the division responsible for demonstrating the knowhow package.

Testing & Analysis:

The division is also responsible for processing of the samples received by the institute for testing and analysis. The samples are sent to the respective division and on completion of the analysis, the reports received by the division are sent to the respective parties.

MoU/Agreement:

In addition to the MoU signed for technology/knowhow transfer, agreements were signed with various organization/universities for different purpose as given below:

SI No.	MoA/MoU/Agreement	Purpose	Party	Date Of Signing
1	Agreement	Knowhow transfer agreement for production of Liquid Deodorant	Mr. Purbashu Dutta, proprietor, M/S. Etherel Aromatics, a company having its registered office at H/N7, Uday Path, RG Baruah Road, Guwahati-781024, Kamrup (M), Assam	03.04.14
2	MoA	DNA Fingerprinting of Lignocellulose degrading microbes isolated from protected forest areas of Assam and Mizoram (GPP-0291)	President of India, acting through secretary, dept. of Biotechnology, Ministry of Science and Technology, Govt. of India, New Delhi	10.04.14
3	MoA	Creation of Bioinformatics infrastructure facility (BIF) for the promotion of biology teaching through bio informatics (BIBI) a scheme of BTIS net	DBT, Govt. of India, New Delhi	08.05.14
4	Agreement	Technology Marketing Agreement	CSIR-Tech Private Limited, 180 NCC Innovation Park, Bhabha Road, Pune-411008	19.08.14
5	Agreement	Confidentiality agreement for a novel Lung Cancer Therapy through vapour inhalation of compounds from plant source	Cadila Healthcare Ltd., Ahmedabad, Zydus Tower, Satellite Cross Roads, Ahmedabad,- 380015, Gujarat	21.08.14
6	Agreement	Butterfly and plant interaction studies in NRL Butterfly Valley	Numaligarh Refinery Ltd.	25.08.14
7	Agreement	Proces of production of natural pesticide for Red Spider Mite (RSM) and further research	TATA Chemical Ltd. Bombay House 24, Homi Modi Street, Mumbai- 400001, India	18.09.14

8	Agreement	Confidential information on high strength proppants developed by CSIR-NEIST, Jorha	M/S Ashapura Group of Industries, Jeevan Udyog Building, 3rd floor, 278, Dr. D.N Road, Mumbai- 400001, India	25.11.14
9	Agreement	Liquid Deodrant	Mr Arindam Ghosh, 145 Gangail Road, Near Rest House, P.O- Agartala, Tripura-799001	17.02.15
10	Agreement	Small Community level low cost process from Local Business for Iron and Flouride Removal from Bore well water of Assam (Local-Mass)	M/S Hydron (India), Agroup of Engineers for Water Treatment, Opp-Kralguri H.S School Dergoan, P.O-Barua Bamun Goan, Dist- Golaghat, Assam- 785618	23.02.15
11	Agreement	Small Community level low cost process from Local Business for Iron and Flouride Removal from Bore well water of Assam (Local-Mass)	M/S Sankalpa Sikha, Estd. 31-05-2013, Regd No. Jor 238-F-95 OF 2013-2014, Jorhat-785001, Assam	23.02.15

Planning and Project Monitoring Division

Planning and Project Monitoring (PPM) Division basically involved in the R&D management in terms of planning and allocation of resources and evaluation of outcomes of R&D projects. The PPM Division serve as the main centre for appropriate dissemination of information regarding Network projects (BSCs, CSCs, ESCs, ISCs, OSCs, PSCs, etc), Other Lab Projects (OLPs), Headquarter Controlled Projects (HCPs), Technology Leadership Projects (TLPs) and In-House projects (MLP, STS) as well as the other externally funded projects like (GAP, CNP, CLP and SSP) to the management and as well as the concerned scientists. The division provides proper logistic support to the management in respect of successful implementation and completion of the projects which reflects in the growth of the institute. The division also prepares the annual performance target of the projects and the laboratory as a whole by focusing the R&D thrust areas which are in accordance with the CSIR vision and National mission. The division also acts as a link between CSIR HQ and laboratory with respect to formulation of the Five Year Plan (FYP), Annual Plans and their execution, monthly and quarterly performance reporting and developmental activities of the laboratory. The division is also entrusted with preparation of various documents such as Man-month Distribution of projects, Task Assignment of staff, Manpower Profile, etc. The division updates the information of various projects and reports were prepared regularly for management support and other purposes. Processing of purchase indents and maintenance of Lab Notebooks are also important activities of PPM division.

Subject Area: Management Science.

Type of Project: Grant-in-aid

Project No: GPP-282

Project Title: Motivational Programmes for School Students.

Funding Agency: RVSP, DST, New Delhi.

PI & Members: Dr Jatin Kalita (PI), Ms Kalyani Medhi (Coordinator), Mr Madhurjya Saikia

Objective:

The objective of the programme is to give the participants - selected bright students from high and higher secondary schools-- an exposure to the world of science in general, and the activities and achievements in science and technology in India. The programme will endeavour to inculcate in the participants a scientific temper and to encourage them to take up science in their career. Demystification of science and familiarization with the workings of the scientists are also proposed.

Salient Achievements:

The CSIR-North East Institute of Science and Technology (NEIST), Jorhat, has organized a series of Motivational Programmes for selected, bright higher secondary and high school students.

The laboratory organized **three six-day and three one-day Motivational Programmes** as per the following dates:

Six-day Programmes:

26-31 May 2014: Thirty eight (38) students, ten (10) teachers from Assam, Nagaland and Arunachal Pradesh participated in the programme.

5-10 January 2015: Twenty six (26) students, four (4) teachers from different districts of Assam and Manipur participated in the programme.

2-7 February 2015: Twenty four (24) students, seven (7) teachers from different districts of Assam and Sikkim participated in the programme.

One-day Programmes:

20 June 2014: Twenty four (24) students, three (3) teachers from Jorhat district of Assam participated in the programme.

22 January 2015: Forty (40) students, four (4) teachers from Jorhat district of Assam participated in the programme.

23 January 2015: Thirty (30) students, three (3) teachers from Jorhat district of Assam participated in the programme.

The programmes included, *inter alia*, visits to the various sections of the laboratory, elocution competition on pre-intimated science topics, popular science talks, and a very interesting informal item called 'Face to Face with Scientists' and 7/6 project assignments (groupwise) on seven different areas (7/6 projects in each programme).

The programme also included visits to various research institutes: the Tocklai Tea Research Institute, Jorhat; the Assam Agricultural University, Jorhat; ruins of ancient architectures at Deopahar, Numaligarh, and archaeological study at Sivasagar. Local ethnic cultural show was also organized among the different groups of the participants in which guest invitees also presented their programmes.

PPM Division is actively involved on the following activities:

External Cash Flow (ECF): The institute undertakes projects funded by various external agencies. The details of funds received from these agencies were regularly recorded and monitored. Monthly statements of department wise ECF positions of the institute were prepared highlighting receipts

from Govt Departments, Public and Private organizations. Total ECF generated during 2014-15 was A 507.14 lakhs which comprised receipts from Govt Depts/ Ministries, Public Sector Industries and Private Sector organizations to the extent of 90.29%, 6.31% and 3.40% respectively. ECF of the institute from different projects and services are shown below:

**EXTERNAL CASH FLOW (ECF)
(Including Service Tax)**

(Rs in Lakhs)

Sl. No	Category	Govt.	Indian Industry	*CPSE	**SPSE	Foreign Company	Foreign Agency	Others	Total 01/04/2014 To 31/03/2015
1	Collaborative	0.000	2.502	0.000	0.000	0.000	0.000	0.000	2.502
2	R&D Consultancy	7.044	0.100	0.000	22.460	0.000	0.000	0.000	29.604
3	Grant-in-aid	436.925	0.000	0.000	0.000	0.000	0.000	0.000	436.925
4	Premia	0.000	0.562	0.000	0.000	0.000	0.000	0.000	0.562
5	Royalty	0.000	0.051	0.000	0.000	0.000	0.000	0.000	0.051
6	Sponsored R&D	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	Technical Service	2.935	14.031	2.322	7.207	0.000	0.000	0.000	26.495
Total:		446.904	17.246	2.322	29.667	0.000	0.000	0.000	496.139

* CPSE : Central Public Sector Enterprise

**SPSE : State Public Sector Enterprise

The area wise ECF are as follows:

Areas	ECF(in Lakhs)
Agro Technology	68.01
Biological Sciences	54.57
Chemical Sciences	48.01
Engineering Sciences	27.94
Extension Centre	0.15
Geo Science	210.23
Management Science	41.89
Material Science	45.34
Total	496.14

Expenditure Monitoring: The expenditure of all the projects were monitored as per the budget allocation and uploaded the details of receipt & expenditure in PPM portal so that the fund position of a given project is readily accessible by concerned PI and management for effective management. We help to prepare Utilization Certificate and Statement of Expenditure of the externally funded projects.

Service Tax: The PPM Division regularly carries out activities for the payment of service tax accrued from the various services rendered by the institute on monthly basis. Total Service Tax realized during the year 2014-2015 (@12.36%) is Rs. 6.05 lakhs.

Project Status: Status of Project Contracted and Completed during 2014-2015 are as follows:

S No.	Sources Project	Project Contracted		Project Completed	
		Contract Value (Rs in Lakhs)	No. of Projects	Contract Value (Rs in Lakhs)	No. of Projects
1.	Grants-in-Aid	536.20	07	283.36	5
2.	Collaborative	0.00	00	5.00	1
3.	Consultancy	16.68	03	3.26	2
	Total	552.88	10	291.62	8

Audit Queries: The division responds to various audit queries (ISO, Internal & External), Parliament queries and Rajya Sabha queries in relation to all type of projects. During the year 11 ISO, 08 internal (CSIR-Hq) and 23 external (CAG) audit queries were handled and replies were prepared.

Contribution to Lab Reserve Fund: The division has taken initiative to transfer the overhead and Non-Refundable Balance amount of Rs 37.83 Lakhs from ongoing as well as closed Externally Funded Projects to LRF in the financial year 2014-2015.

Research Utilization Data: Research Utilization Data deals with the revenue generated from the projects and other activities funded by external funding agencies undertaken by the institute. Yearly and quarterly reports were furnished to CSIR Headquarters regularly.

PPM website: PPM division hosted and maintained a website for display of all the project related reports on-line. The PPM website is linked to the NEIST Intranet and at present displays reports on Projects-(Completed, on-going, in proposal stage), Research Utilization Data, External Cash Flow, Expenditure details of all ongoing funded and network projects, Service Tax, Organisation Structure, Computer AMC, Employee List, Central Plan Scheme Monitoring System etc. Principal Investigators of projects can access and monitor on-line the expenditure incurred in their projects. For analysis of outcome of funded projects, the on-line form has been designed and the Principal Investigators are to fill it on completion of their projects. The reports available on-line have proved to be efficient technical support for the management and scientists.

ERP System: CSIR has taken initiative to adopt Enterprise Resource Planning (ERP) system across all 38 CSIR institutes. CSIR-NEIST has constituted an ERP implementation team for successful implementation of ERP in the institute. PPM division is mainly involved in updating project related data and mapping of NEIST staff with the roles of the staff, in CSIR Enterprise Transformation Portal.

Annual Plan: Annual Plan 2014-15 document was prepared for NEIST, which contained information related to research work plan to be carried out during the year. The financial requirements for these projects, Plan and Non-Plan basis, were also identified and managed.

Monthly/ Quarterly Performance Report: Monthly/ Quarterly Performance Report of NEIST contains information about the performance of the Institute on various parameters like papers, patents, development of technology, awards & appreciations received by scientists & staff members. Reports are regularly sent to CSIR Hq for their perusal. These reports also help the management in reviewing its own performance as a monitoring tool.

Man-month distribution of projects: The manpower deployment in Network, in-house, Grant-in-aid, Sponsored and consultancy projects were analyzed and reviewed by division. Resource requirements and utilization were reviewed. “Manpower profile of CSIR-NEIST” document was brought out for management purpose.

Miscellaneous activities:

- a. Form-16 for all income tax assesses were generated.
- b. Lab Notebooks are indexed and maintained for future reference and intellectual property rights protection by the division. During the year, 61 nos. issued, 35 nos. returned & reissued.
- c. The Division actively associated with the celebration of the CSIR Foundation Day on 26 September, 2014 and organized an essay and quiz competition on science topics among the staff of CSIR-NEIST & their wards.
- d. Task assignment of staff members for 2014-2015.
- e. Management of Annual Maintenance Contract (AMC) of 260 nos of computers under AMC and 55 nos of computers under warranty.

Knowledge Resource Centre

The Knowledge Resource Centre (KRC) continued to provide library and information services to R&D division, Research Fellows, outside students and individuals like from universities of NE region and R&D and industrial institutions such as Rain Forest Research Institute, Jorhat, Tezpur University, Dibrugarh University, Gauhati University, Assam University, Assam Engineering College, Jorhat Engineering College, etc. The KRC also provides services to NEIST Branch Laboratory, Itanagar, Arunachal Pradesh and Imphal, Manipur. During the period the KRC added 3 books to its stock. It subscribes to 24 foreign and 42 Indian journals of which 20 in electronic form. During the period, the KRC also collected Annual and other reports from various R&D and academic institutions.

The KRC continues to maintain database on publications and presentation of papers from the laboratory on the basics of which various reports with bibliometric analysis of laboratory's publications were carried out as and when required by the management. A data base on available Ph.D. thesis of NEIST, Jorhat was updated.

S&T Services & Facilities Installed



The construction of new S S BHATNAGAR Building for housing sophisticated equipments is now completed. The Building was inaugurated by Bharat Ratna Prof. C. N. R. Rao on 18-03-15. Procurement of Field Emission Scanning Electron Microscope (FE-SEM) with an Energy Dispersive X-ray (EDX) spectrometer is completed and the installation is under process. The work carried out under the project CSIR Advanced Analytical Facility for North East (CAAF-NE) [FAC – 0408].

Petroleum & Natural Gas



Fig: Professional Biodiesel Rancimat – Metormh, Switzerland



Fig. High Temperature Gel Permeation Chromatography Unit – Malvern, UK

Chemical Engineering



Fig: UHPLC



Fig. Gas Chromatograph



Fig: Capillary Condensation Flow Porometer

Cellulose Pulp & Paper



Fig: Multi Layered Hydraulic Hot Press For Making Composite Board



Fig: Bamboo Chipping Machine

Coal Chemistry



Fig: Integrated Coal-Based Gasifier System



Fig: High Pressure Reactor

Applied Civil Engineering



Fig: Electronic Triaxial Shear Test Apparatus



Fig: Digital Consolidation Test Apparatus

Biological Sciences



Fig: Bioreactor 10 L Capacity was installed

Material Sciences



Fig: Zeta potential analyzer (NanoZS)



Fig: Gamry electrochemical system
Model: Interface 1000, Gamry Instruments, USA



Fig: Flash Chromatography System
Model: Cheetah MP-100, Agela Technologies, China



Fig: Surface Area Analyzer
Model: Autosorb iQ, Quantachrome Instruments, USA



WORKSHOP/SEMINAR ORGANIZED



The 8th Mid-Year CRSI National symposium in Chemistry was jointly organized with Tezpur University at CSIR-NEIST during 10-12 July, 2014. 21 lead and invited lectures and one special lecture from eminent scientists were delivered along with 141 poster presentations. More than 380 participants were registered.



The National Symposium-Cum-Workshop on “NER Coals and Minerals: Issues, Challenges and Opportunities” was jointly organized with Indian Institute of Mineral Engineers - NE Chapter, Jorhat-785006, Assam at its premises during 30 - 31 October, 2014 which was supported by Ministry of Communication & Information Technology, New Delhi, Govt. of India. 13 technical lectures were delivered by eminent scientists and professors, 135 participants were registered



School Children Sensitization workshops were organized in 4 state capitals viz, Gangtok (Sikkim), Agartala (Tripura), Imphal (Manipur) and Aizawl (29 September, 2014)

M8.7 Shillong 1897 Earthquake Scenario Development: NE Multi-State preparedness campaign



Chronology of Events: MMEX in NE States (M 8.7 scenario Development)

		Arunachal Pradesh <i>Itanagar and Ziro</i>	10 th March 2014
		Assam <i>Jorhat and Gauhati Silchar</i>	10 th March 2014 13 th March 2014
		Meghalaya <i>Shillong and Tura</i>	10 th March 2014
		Sikkim <i>Gangtok and Mangan</i>	10 th March 2014
		Mizoram <i>Aizawl and Serchhip</i>	10 th March 2014
		Tripura <i>Agartala and Dharmanagar</i>	13 th March 2014

Organized RVS Training Workshop on Rapid Visual Screening (RVS) of building & lifeline structures in all the NE India states during 2014.

Mega Mock Exercise (MMEX) were undertaken to understand the implication of a possible major earthquake and its likely impact on NE States on preparedness, response and coordination.



Prof T K Chandrashekar, Secretary, SERB, DST delivered the National Technology Day lecture on 12 May, 2014 at CSIR-NEIST

Dr P S Ahuja, former Director-General, CSIR delivered the 20th Dr J N Baruah Lecture on 2 September, 2014 at CSIR-NEIST.



EVENTS ORGANISED

68th Independence Day



Dr D Ramaiah, Director, CSIR-NEIST unfurling the National flag on 15 August, 2014 on the occasion of India's 68th Independence Day celebration at CSIR-NEIST.

CSIR-NEIST observed State Mourning Day

At the instance of Government of Assam, the institute observed the State Mourning Day (Shok Diwas) on 16 August, 2014 along with the rest of the state in the memory of those killed in bomb blast on Independence Day (15 August, 2004) at Dhemaji under Lakhimpur district of Assam. A pledge taking function was held at Dr J N Baruah Auditorium in which the Dr D Ramaiah, Director, CSIR-NEIST administered the Shok Diwas pledge to members of the staff.

CSIR-NEIST observed Sadbhavana Diwas

The Institute observed 'Sadbhavana Diwas' on 20 August, 2014 along with the rest of the country. The day is observed every year to commemorate the Birth Anniversary of Late Prime Minister of India, Shri Rajiv Gandhi. Dr D Ramaiah, Director, CSIR-NEIST administered the Sadbhavana Diwas pledge to members of the staff.

Hindi Week celebrated at CSIR-NEIST during 9-15 September, 2014



Sri Sunil S Patkar, Airport Director, Jorhat delivering his address as Chief Guest at the concluding function held on 15 September, 2014. Also seen on the dais are (from right), Dr D Ramaiah, Director, CSIR-NEIST and Dr D Prajapati, Chief Scientist & Chairman, Official Language Implementation Committee, CSIR-NEIST.

CSIR-NEIST celebrated 72nd CSIR Foundation Day on 22 September, 2014

Padmashree Prof D Balasubramanian, Research Director, L V Prasad Eye Institute & Former Director, CSIR-CCMB delivering the 72nd CSIR Foundation Day Lecture as Chief Guest.



Vigilance Awareness Week:



Mr Pankaj Sharma, Wing Commander, Air Force, Jorhat delivered the valedictory speech as Chief Guest on 3 November, 2014 after the celebration of Vigilance Awareness week during 27-31 October, 2014 at CSIR-NEIST.

National Integration Pledge taken

On the occasion of Communal Harmony Campaign and Fund Raising Week organized every year, the members of staff led by the Director, CSIR-NEIST took National Integration pledge on 19 November, 2014. As a fund raising gesture, the communal harmony sticker flags were also distributed on sale to all the staff members.

Director, CSIR-NEIST addresses staff on New Year



Dr D Ramaiah (Centre), Director, CSIR-NEIST addressing the staff members on 1 January, 2015. Sri Ajay Kumar (right), In-charge-Hindi cell and Dr R L Bezbaruah (left), Head- I& BD Division are seen translating the speech in Hindi and Assamese respectively. CSIR-NEIST staff members attending the address.

66th Republic Day



Dr D Ramaiah, Director, CSIR-NEIST is seen delivering the 66th Republic Day address. The celebration included Parade, unfurling of the flag followed by playing of National Anthem. Later various sport competitions were also held.



CSIR-NEIST Celebrated National Science Day on 25 February, 2015

Left inset: Prof Harsh K Gupta, Member, Atomic Regulatory Board; President, Geological Society of India; President, International Union of Geodesy & Geophysics and Chairman, Research Council, CSIR-NEIST delivering the National Science Day lecture on 'Living with Earthquakes in the North-East India'.



Right: Dignitaries on the dais (from left), Dr R C Boruah, Outstanding Scientist, CSIR-NEIST; Prof Harsh K Gupta, Chief Guest of the programme; Dr D Ramaiah, Director, CSIR-NEIST and Prof Kankan Bhattacharyya, Department of Physical Chemistry, Indian Association for the Cultivation of Science, Kolkata present as Guest of Honour. (Dr Bhattacharyya delivered a popular talk on Raman Effect and brief history of Prof. Raman).

CSIR-NEIST Celebrated International Women's Day on 10 March, 2015



Left inset: Dr Neelima Saikia, Former Principal Scientist, CSIR-NEIST delivering Women's Day Lecture as Chief Guest. Right: Other dignitaries seated on the dais are (from right), Dr Minakshi Pathak, Ex-Dean, Dept. of Home Science, AAU-Jorhat present as Guest of Honour and Dr D Ramaiah, Director, CSIR-NEIST

54th CSIR-NEIST Foundation Day on 18 March, 2015

Bharat Ratna Prof CNR Rao, FRS, National Research Professor, JNCASR, Bengaluru, delivering the 54th CSIR-NEIST Foundation Day Lecture on 18.03.2015. Other dignitaries on the dais are (from left), Dr R C Boruah, Outstanding Scientist, Dr D Ramaiah, Director, CSIR-NEIST and Mrs Indumathi Rao. Prof Rao, Guest of Honour,



Staff Club Activities:

Staff club members organised programmes viz., celebration of Bihu, Saraswati Puja, Sankardeva birth centenary etc. at CSIR-NEIST colony.

EXHIBITIONS ATTENDED



CSIR-NEIST participated in the exhibition held on the occasion of **Farmer's Day** on 4 November, 2014 at Regional Agricultural Research Station, Titabar and disseminated its various rural based technologies through display posters, banners and other exhibit materials.

CSIR-NEIST Branch Laboratory, Imphal:

Dr HB Singh, Scientist-in-Charge, NEIST Branch Laboratory, Imphal have attended as Chief Guest in the valedictory function of “**15-day exhibition program on fibre extraction and dyeing out of plantain and Agave**” organized by Thongju Handloom Cluster Consortium, Imphal on Dec 11, 2014.

SOCIETAL ACTIVITIES

Societal Workshop/Training/ Awareness Programme held:

Workshop was organised in collaboration with SasiWaters, Hyderabad and Ecoconcept Guwahati, on “Arsenic in ground water - The Jorhat scenario” on 28 -11-2014 as one day long multi sectoral brain storming session by Dr. R.L. Goswamee as secretary.

Training programme on Liquid deodorant cleaner production under the CSIR rural development project OLP- 4400 was conducted at 44 Madhya Sarucharai Gaon panchayat , Jorhat (Dec 23, 2014) and Bamchungi gaon panchayat, Jorhat (March 27,2015) and imparted training to 130 and 75 rural entrepreneurs respectively including women.



Fig: CSIR rural development programme under OLP 4400 project



Training imparted and technical guidance provided on “Cultivation of mushroom”: Twelve nos. of programmes were organized during August/2014 to March/2015 to more than 250 nos. of beneficiaries.

CSIR-NEIST Branch Itanagar had organized twelve nos. of training programme on “Cultivation of mushroom” in different villages of Arunachal Pradesh. More than 250 nos. of beneficiaries attended these programmes and around 50 nos. of beneficiaries from different SHG/NGO etc. cultivated the mushroom and have earned about 1, 20,000 rupees.



Fig: Awareness programme on “Cultivation of Mushroom” at Karmajuli village on 02.03.14 (Total participants 25 nos.)



Fig: Awareness & training programme on “Cultivation of Mushroom” at Lorr village on 03.02.14 (Total participants 30 nos.)

CSIR-NEIST Branch Itanagar organized five nos. of training programmes on “Production of Vermicompost” in different villages of Arunachal Pradesh to more than 100 nos. of beneficiaries where around 30 nos. of beneficiaries from different SHG/NGO etc. produced vermicompost and have earned about 1,00,000/- rupees.



Fig: “Production of Vermicompost” at Pech village, A.P. under our guidance

Under “Self-empowerment by the women community of rural areas of West Jorhat (SC populated) through organic vegetable gardening as well as production of popular food viz. Mushroom Cultivation, sponsored by Department of Scientific & Industrial research, Govt of India”, project awareness programme was held at two different tea gardens in presence of total 4 nos of tea garden women community. Nutritional benefit of Mushroom consumption especially for women and children was also focused and In-Campus training was imparted to total 700 women of tea garden.



Fig: Awareness programme held at Horucharai Tea Estate & Amalgamated Plantations Private Limited, A Tata Enterprise, under Teok tea estate

Dr Chandan Tamuly, CSIR-NEIST Branch Itanagar delivered a talk on “Wild edible plants of Arunachal Pradesh and nutritional value” along with Dr. B.C. Baruah to nearly 25 nos. villagers of Yupia village, Papum Pare, Arunachal Pradesh on 01.12.14. Dr. B.C. Baruah requested the villagers to conserve and cultivate their valuable edible plants.



Fig: Awareness programme on wild edible plant at Yupia village at 1.12.14 (Total participants 35 nos.)

Health Camp Held:

A Health Camp in Lower Primary School, Sohkyphor village under West Jaintia Hills District of Meghalaya was conducted on 17.10.2014 under the CSIR Network project 'Therapeutics of chronic obstructive pulmonary disease (COPD) and related respiratory disorders' (BSC0116). The objective of the particular project is to survey and organize health camps in coal mine areas of

Assam and Meghalaya in relation to COPD disease. This was the sixth Health Camp organized under this project and first of its kind to organize in Jaintia Hills, Meghalaya. A team comprising of Dr PK Baruah and Dr CB Duarah have done the medical check up to a large number of villagers/patients and out of which a few of them were suspected to have COPD which was coordinated by Dr BG Unni. Most of the patient have also gone through blood and spirometry tests and medicines were distributed free of cost among the patients. The Health Camp was organized with the help of doctors

from the local Health Centre and members from M/s Seng Kynjoh Shaphrang Ki Kynthei (NGO). COPD is suspected to develop due to genetic and environmental factors.



Fig : A large number of villagers waiting for the medical check in the health camp



Fig: Dr PK Baruah checking the patient in the Health Camp

A health camp was organized in collaboration with Institute of Integrated Resources Management (IIRM), Tezpur on 1st July 2014 at the CSIR-800 Techvil at Tezpur, Sonitpur where free consultations and checkups were provided to the targeted malnourished population under the 12 FYP project (BSC-0125) "S&T interventions to combat malnutrition in women and children". Blood samples of 95 people (women & children) for clinical examination and biochemical testing was collected and medicines were distributed free to the people by a team comprising of Dr. PK Baruah, Dr. SP Saikia, Dr. Aradhana

Goswami, Mrs. Minu Prova Pegu and Mrs. Noly Niangmuanching.

Another health camp was organized under the same project in Sonitpur, Assam in collaboration with the Institute of Integrated Resource Management (IIRM), Tezpur on 13th March 2015 where anthropometric measurements and systemic examination of respiratory, gastrointestinal, nervous, cardiovascular and locomotors system has been undertaken. One kilogram each of Komal Chawl (Soft Rice) which has been made with bran intact and thus is rich in dietary fiber and



Fig: Health Camp at CSIR-800 Techvil, Sonitpur

essential fatty acids and contains significant quantities of starch, protein, vitamins, and dietary minerals has also been distributed among the targeted malnourished population.



Fig: Health Camp at CSIR-800 Techvil, Sonitpur

A free medical camp was organized at the Branch Laboratory, Imphal, Manipur in collaboration with Integrated AYUSH Hospital, Manipur on Nov 14, 2014. The emphasis was given on treatment of arthritis by using medicine developed by NEIST, Jorhat. Other treatments including YOGA were also practiced. A total of 71 patients were treated. Dr O Ibomcha Singh, Director, Directorate of Health Services Manipur, Dr S Bimolakumari Devi, Chief Medical Officer, Imphal West and Dr D Ramaiah, Director, NEIST Jorhat were Chief Guest, Guest of Honour and President, respectively.



About 10 nos. of health screening programmes were organized at Clinical centre, CSIR-NEIST, Jorhat for nearly 1000 male and 600 female individuals for various camps viz., **bone mineral density detection, liver fibro scan screening, glycosylated hemoglobin detection, spirometry** in suspected COPD patients, diabetes type 2 detection, microalbumin detection, uric acid screening etc.



Fig: Health Camps in a tea garden area, near Tezpur (Project No. BSC-0125)



Fig: Health Camps in a colliery (Project No. BSC-0116)

Earthquake Disaster management program held (Under NDMA, New Delhi):

Organized Training on Rapid Visual Screening (RVS) of building & lifeline structures at Guwahati, Jorhat, Kohima, Shillong, Imphal, Aizawl, Gangtok, Itanagar and Agartala. Organized Mega Mock Exercise (MMEx) on Earthquake Safety at 32 locations covering all the 8 NE India states with help & support from NDMA, New Delhi and respective SDMAs (March – April 2014). The MMEx were conducted at several locations across all the NE India states. Apart from the respective SDMAs, Fire Service, Medical Service, Police Forces, Transport department, State Electricity Board, Telecommunication department, Civil Defense Volunteers, Army, Home guards and NDRF took part in the exercise. The MMEx helped in evaluating the preparedness of the Emergency Operation Centres, Incident Response System, State Disaster Response Forces apart from medical service, communication and other services those are likely to be pressed into immediate action during a disaster.

School sensitization workshop in earthquake vulnerable Northeast States:

The workshop was organized jointly by CSIR-NEIST, Jorhat and CSIR-NEIST Branch Laboratory, Imphal under the sponsorship of National Disaster Management Authority, New Delhi on Sep 25, 2014 at CSIR-NEIST Branch Laboratory, Imphal. A total of 1710 students & 31 teachers from various schools of Manipur & officials have attended the program. The program was attended by Shri UC Laishram, Director, Science & Technology, Manipur, Shri Th Surendranath Singh, Director, MASTEC, Dr S Bimolakumari Devi, CMO, Imphal West, Dr R Duarah, NEIST, Jorhat & Dr RS Saxena, Team Coordinator, Earthquake Scenario Project, NDMA, New Delhi attended as Chief Guest, Guests of Honour & President, respectively.



Motivation to the bright students of NE:

CSIR- New Delhi introduced a scheme of Cash Awards to motivate Bright SC / ST Students to take up science studies at +2 / Junior College level. It is well acknowledged that education acts as feeder to any development, so motivating students in this sphere with incentive mechanism will definitely accelerate the process of development of SC / ST students and subsequently their community which in turn will add to our contribution of nation building. The award ceremony was held on the foundation day of CSIR i.e. September 26, 2014. Altogether, 16 bright SC / ST students and who have passed Class X examination in the year 2014 from State Boards of north-eastern states were nominated out of which six students participated in the award programme, some of the students could not attend the programme owing to their routine examination.

Students Visit:

Thirty seven meritorious students and teachers of Manipur have visited the Branch Laboratory, Imphal, Manipur on Oct 29, 2014 under the sponsorship of MASTEC, Imphal and catalyzed by DST, New Delhi. Lecture series, interaction with scientist and scientist, field demonstration of herbal garden and laboratory experiments on extraction of essential oils were demonstrated during the 1-day program.



NEIST-CSTRI Centre:



Common Facility Centre (CFC) on weaving & Textile products inaugurated at New Sonowal area, Mariani by Padma Bhushan Dr T Ramaswami on 16 May, 2014



PhD Awarded

Sl. No	Subject Area	Title of Ph.D. Thesis	Name of Research Fellow	Name of the Supervisor	Name of the University
1	Chemical Science	Studies on a Few Flora of Arunachal Pradesh Used by Tribal Communities with Emphasis on Nutritional Value and Secondary Metabolites	Dr Chandan Tamuly	Dr Manab jyoti Bordoloi	Dibrugarh University
2	Biotechnology	Genetic and functional diversity of fluorescent Pseudomonads associated with rhizosphere of green gram (Vigna radiata) in Jorhat district of Assam and their role on water stress resistance.	Dr R Sharma	Dr Ratul Saikia	Gauhati University
3	Life Sciences	Characterization and utilization of hydrocarbon utilizing bacterial strains isolated from crude oil contaminated soil of different drill sites of Assam and their application for bioremediation.	Dr Rosy Yenn	Dr H P Deka Boruah	Assam University, Silchar
4	Earth Sciences	Seismic Tomography and Attenuation Characteristics of Northeast Indian Region.	Ms Deepika Pandey	Ms Sagarika Mukhopadhyay, Saurabh Baruah and J R Kayal	Department of EarthSciences, IIT Roorkee
5	Chemical Science	Studies on the synthesis of novel heterosteroids and some synthetic methodologies.	Dr Pranjal Bezboruah	Dr RC Boruah	AcSIR, New Delhi

Fellowship

Sl. No	Name of staff	Name of fellowship received	Name of awarding body/org.	Purpose	Duration
1	Dr Dipul Kalita	DBT overseas associateship fellow	DBT	Advanced research	1 Year
2	Dr Ratul Saikia	DBT Overseas Associateship Award-2014	DBT, New Delhi	Advanced research	3 Months
3	Dr Mantu Bhuyan	DBT overseas associateship fellow	DBT	Advanced research	1 Year

Visit Abroad

Sl. No	Name of staff	Place	Purpose	Duration
1	Dr D Ramaiah, Director	United Kingdom	To deliver invited lecture and attend the UK-India Chemistry Symposium 2014, co-hosted by the Royal Society of Chemistry, London and Chemical Research Society of India at London and at the University of Cardiff, Wales, UK	23 rd June, 2014 to 26 th June, 2014
2	Dr SP Saikia , Scientist	Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, Sofia	To present a paper in the Scientific Conference on "Plant Physiology and Genetics – Achievements and Challenges"	24 th September, 2014 to 26 th September , 2014.
3	Mr Bijit Kumar Choudhury, Scientist	ICTP, Trieste, Italy	To attend the UN's (United Nation) sponsored Advanced Workshop and School entitled "Megathrust Earthquakes and Tsunamis"	13 th October, 2014 to 24 th October, 2014
4	Dr Santanu Baruah, Scientist	ICTP, Trieste, Italy	To attend the UN's (United Nation) sponsored Advanced Workshop and School entitled "Megathrust Earthquakes and Tsunamis"	13 th October, 2014 to 24 th October, 2014
5	Dr SP Saikia , Scientist	Institute of Agricultural Biology and Biotechnology (IBBA), Milan, Italy	To carry out a scientific research under the "CSIR, India/CNR, Italy S&T Working Programme for the year 2012-2014"	07 th November , 2014 to 17 th November, 2014

संस्थान में राजभाषा गतिविधियां

RAJBHASHA HINDI ACTIVITIES IN THE INSTITUTE

हिन्दी दिवस समारोह का आयोजन

प्रत्येक वर्ष के भांति इस वर्ष भी सीएसआइआर-उत्तर-पूर्व विज्ञान तथा प्रौद्योगिकी संस्थान, जोरहाट ने राजभाषा हिंदी कौ कार्यालयीन कार्य में उत्तरोत्तर वृद्धि करने के लिए संस्थान में राजभाषा हिंदी सप्ताह का आयोजन किया एवं इसके विशाल सभागार में विभिन्न कार्यक्रमों के साथ 15 सितम्बर को हिंदी दिवस समारोह मनाया गया। रविवार 14 सितम्बर संस्थान में अवकाश होता है इसलिये तिथि में परिवर्तन किया गया।

अपने निर्धारित समय के अनुरूप कार्यक्रम का शुभारंभ राजभाषा प्रभारी श्री अजय कुमार ने भारत सरकार के गृह मंत्री के हिन्दी दिवस संदेश पढ़कर किया। समारोह के मुख्य अतिथि के रूप में श्री सुनील एस पाटकर, एयरपोर्ट निदेशक, भारतीय विमानपत्तन प्राधिकरण, जोरहाट उपस्थित थे। अपने व्याख्यान में श्री पाटकर ने अपील करते हुए कहा कि हिन्दी को दिल से अपनाएं तभी कुछ करने की इच्छा होगी। भाषा को सीखने के लिए पहले उसे मन से स्वीकार कीजिये। हिन्दी केवल कार्यालय की भाषा नहीं है बल्कि देश के जन जन की भाषा है, यह हमें आपस में जोड़ती है, राष्ट्रीय पहचान और गौरव प्रदान करती है। इसके लिए दिवस या सप्ताह मनाने की आवश्यकता नहीं होनी चाहिए। उन्होंने यह भी कहा की संघ की राजभाषा हिन्दी होने के कारण यह हमारा कर्तव्य है कि हिन्दी के प्रयोग को बढ़ावा दें, अन्य कार्यों के साथ यह कार्य करना हमारी जिम्मेदारी है। राजभाषा नियम का पालन सरकारी सेवा कि आवश्यकता है। हिन्दी के उत्थान में निस्ट, जोरहाट



दाये से मुख्य अतिथि श्रीसुनील एस पाटकर, डॉ. डी रमाइया, निदेशक निस्ट, जोरहाट एवं मुख्य वैज्ञानिक डॉ. डी प्रापति

के योगदान की सराहना की।

निस्ट, जोरहाट के निदेशक डॉ. डी रमाइया ने अपने संबोधन में राजभाषा हिन्दी के प्रचालन पर बल दिया। उन्होंने विज्ञान के अनुसंधान को सरल रूप में हिन्दी एवं क्षेत्रीय भाषा में प्रसार करने की आवश्यकता के बारे में कहा, ताकि विज्ञान को जन मानस तक पहुंचाया जा सके। कार्यालय में राजभाषा के रूप में हिन्दी के प्रयोग को बढ़ाने का आग्रह किया। अपने सवागत संबोधन में मुख्य वैज्ञानिक एवं राजभाषा कार्यान्वयन समिति के अध्यक्ष डा. डी प्रजापति ने उपस्थित सदस्यों का स्वागत किया एवं संस्थान में राजभाषा हिन्दी गतिविधियों का उल्लेख करते हुए अपील किया कि सभी हिंदी में कार्य करने का प्रयास करें।

कार्यक्रम के अंत में पुरस्कार वितरण समारोह का संचालन श्री अजय कुमार, प्रभारी राजभाषा ने किया। उन्होंने संस्थान में 8 से 15 सितम्बर के दौरान आयोजित राजभाषा हिंदी सप्ताह के अंतर्गत विभिन्न प्रकार के हिंदी प्रतियोगिताओं हिंदी श्रुत लेखन, हिंदी लेख लेखन, हिंदी प्रश्नोत्तरी के विजेताओं के नामों की घोषणा की और मुख्य अतिथि महोदय के कर कमलों से उन्हें पुरस्कार एवं प्रमाणपत्र से सम्मानित किया गया। हिंदी शिक्षण योजना भारत सरकार के अंतर्गत प्रबोध/प्रवीण/प्राज्ञ हिंदी भाषा पाठ्यक्रम पास स्टाफ सदस्यों को प्रमाण पत्र प्रदान किया गया। अंत में वित्त एवं लेखा प्रभाग के श्री सोमनाथ ने धन्यवाद ज्ञापित किया।

संस्थान में राजभाषा हिंदी सप्ताह का आयोजन

विगत वर्ष भांति इस वर्ष भी संस्थान में राजभाषा हिन्दी सप्ताह मनाया गया। हिन्दी सप्ताह के दौरान अधिकारियों/कर्मचारियों के प्रोत्साहन हेतु प्रत्येक कार्यदिवस में निम्नलिखित प्रतियोगिताएं एवं कार्यशालाएँ आदि आयोजित की गयी ताकि उनमें एक प्रेरणा और उत्साह की उत्पत्ति हो सके :

8/9/2014 : प्रथम सत्र में हिन्दी सप्ताह का शुभारंभ कार्यक्रम आयोजित हुआ जिसमें संस्थान के प्रत्येक वैज्ञानिक प्रभागों के नामित राजभाषा प्रतिनिधियों ने भाग लिया। द्वितीय सत्र में हिन्दी कार्यशाला का आयोजन किया गया।

9/9/2014 : दोनों सत्र में हिन्दी कार्यशाला का आयोजन किया गया।

10/9/2014 : हिन्दी लेख लेखन प्रतियोगिता आयोजित किया गया। विषय था "भारत के विकास में विज्ञान का योगदान"। काफ़ी

प्रतियोगियों ने भाग लिया।

11/9.2014 : हिन्दी के ज्ञान को केन्द्रित करते हुए हिन्दी क्विज (प्रश्नोत्तरी) प्रतियोगिता आयोजित की गयी। रुचिपूर्ण एवं ज्ञानवर्धक आयोजन के कारण इसमें काफी प्रतिभागी भाग लेते हैं। इस साल भी आयोजन ज्ञानवर्धक एवं आनंदायक रहा। केन्द्रीय विद्यालय, निस्ट जोरहाट के स्नतकोत्तर शिक्षक श्री एस के ओझा के संचालन में प्रतिभागी मुग्ध हो गए।

12/9/2014 : हिन्दी श्रुतलेखन प्रतियोगिता आयोजित किया गया। अतिथि निर्णायक द्वारा शब्द की शुद्धता के आधार पर पुरस्कृत किया गया।



हिन्दी सप्ताह के शुभारंभ पर संबोधित करते हुए डॉ. डी प्रजापति, मुख्य वैज्ञानिक सह अध्यक्ष राकास एवं बैठे श्री अजय कुमार, प्रभारी राजभाषा

संस्थान में हिंदी कार्यशालाओं का नियमित आयोजन

राजभाषा नियम एवं सी एस आई आर मुख्यालय के दिशानिर्देश में संस्थान के वैज्ञानिकों, तकनीकी अधिकारियों, तकनीशियनों, प्रशासन के अधिकारियों एवं कर्मचारियों के लिए तिमाही हिंदी कार्यशाला का आयोजन किया जाता है। प्रभावी कार्यान्वयन की दृष्टि से समय न में रखकर समूह समय पर कार्य एवं पद की एकरूपता को ध्या-लिखितबनाकर कार्यशाला में प्रशिक्षण दिया जाता है। वर्ष के दौरान निम्नप्रमुख कार्यशालाएँ आयोजित की गयी :

21 मई 2014 : नव नियुक्त कार्मिकों के लिए राजभाषा नियमों से परिचय करने के लिए क्या गया।

8 एवं 9 सितम्बर 2014 : संस्थान के सभी वैज्ञानिक प्रभागों के राजभाषा प्रतिनिधियों के लिए हिंदी कार्यशाला का आयोजन किया गया। दो दिवसीय कार्यशाला में राजभाषा अनुभाग द्वारा राजभाषा

नियमों, कंप्यूटर हिन्दी में कार्य एवं गूगल के माध्यम से हिन्दी में अनुबाद करना एवं पत्र तैयार करने की विधि का प्रशिक्षण दिया गया।

10 नवम्बर 2014 : संस्थान के नव नियुक्त तकनीकी कर्मचारी कर्मचारी राजभाषा नियमों से परिचय करने के लिए क्या गया।

9 एवं 10 मार्च 2015 : स्थापना, बिल, नियुक्ति एवं सामान्य अनुभाग के लिए हिंदी कार्यशाला का आयोजन किया गया। दो दिवसीय कार्यशाला में राजभाषा अनुभाग द्वारा कंप्यूटर पर गूगल एवं सहज डिजिटल वैबसाइट के माध्यम से हिन्दी में डायरी करना एवं पत्र तैयारकरने की विधि का प्रशिक्षण दिया गया।

व्याख्यान/संगोष्ठी में सहभागिता, अन्य संस्थाओं/कार्यालयों के हिन्दी कार्यशाला में विशेषज्ञ

श्री अजय कुमार, प्रभारी राजभाषा अनुभाग एवं सचिव, नगर राजभाषा कार्यान्वयन समिति, जोरहाट को निम्नलिखित केन्द्र सरकार के कार्यालयों में राजभाषा हिन्दी के विशेषज्ञ/ संकाय सदस्य/ मुख्य अतिथि के रूप में उल्लेखित तिथि को आमंत्रित किया गया एवं उन्होने तदनुसार प्रस्तुति दी:

ऑयल एवं नेचुरल गैस कारपोरेशन लि., असम एवं असम अराकान बेसिन, जोरहाट : 19 मई 2014 एवं 12 नवम्बर 2014 को एक एक द्वितीय हिन्दी कार्यशाला का आयोजन किया जिसमें मुख्य अतिथि व्याख्याता

भारतीय विमानपत्तन प्राधिकरण, ररैया, जोरहाट : 19 जून 2014 को एक द्वितीय हिंदी कार्यशाला के आयोजन में अतिथि व्याख्यान

भारतीय जीवन बीमा निगम, मण्डल कार्यालय, जोरहाट: 21 मार्च 2015 को हिन्दी कार्यशाला के आयोजन में अतिथि व्याख्यान

क्षेत्रीय रेशम अनुसंधान केन्द्र, केन्द्रीय रेशम बोर्ड, जोरहाट: 25 सितम्बर 2014 को हिन्दी पखवाड़ा के शुभारंभ पर मुख्य अतिथि के रूप में व्याख्यान एवं 4 मार्च 2015 को हिन्दी कार्यशाला के आयोजन में अतिथि व्याख्यान

नवोदय विद्यालय, छिनामार, जोरहाट : 27 फरवरी 2015 को द्वितीय हिन्दी कार्यशाला के आयोजन में अतिथि व्याख्यान

हिंदी शिक्षण योजना द्वारा हिंदी भाषा प्रशिक्षण पाठ्यक्रम केन्द्र का संचालन

हिंदीतर भाषी अधिकारियोंप्राज्ञ प्रवीण र के हिंदी भाषा पाठ्यक्रम प्रबोधकर्मचारियों के लिए निर्धारित स्त पाठ्यक्रम के प्रशिन में उक्तपरीक्षा पास करना अनिवार्य होता है। संस्थाक्षण के लिए वर्ष में भारत 1997 सरकार, गृह मंत्रालय, राजभाषा विभाग, हिंदी शिक्षण योजना द्वारा संस्थान प्रबंधन के अधीन अंशकालिक हिंदी भाषा प्रशिक्षण केन्द्र स्थापित किया। विभाग द्वारा यह केन्द्र स्थानीय सभी केन्द्र सरकार के कार्यालयों के प्रशिक्षण हेतु भी संचालित किया गया। तदनुसार यह केन्द्र सरकार के कार्यालय, स्वयत्तशासी संस्थानों, राष्ट्रीयकृत बैंकों द्वारा नामित अधिकारियों प्राइवेट तौर पर प्रशिक्षण हेतु कर्मचारियों को वर्ष में दो सत्र के अंतर्गत नियमित नामांकित करते हैं। प्रशिक्षण के साथ सात उप(परीक्षा) निदेशक, नई दिल्ली के नियंत्रण में उक्त पाठ्यक्रमों के परीक्षा को भी संस्थान द्वारा संचालित किया जाता है। वर्ष के दौरान निम्नलिखित सत्र एवं परीक्षा आयोजित हुआ :

जनवरी 2014 सत्र : प्रबोध : 30 र्णउत्ती) 30 (प्रवीण : 373 र्णउत्ती) 7 (प्राज्ञ : 42 र्णउत्ती) 42 युनाईटेड बैंक ऑफ इंडिया, सेंट्रल बैंक, भारतीय डाक, वर्षा वन अनुसंधान संस्थान, भारतीय स्टेट बैंक एवं ओ 201 प्राइवेट नामित किए गए तथा मई से प्रशिक्षण हेतु नियमित सी.जी.एन. 4 को आयोजित परीक्षा में भाग लिया। कुल प्रशिक्षित आकडे दर्शाए गए हैं।

जुलाई 2014 सत्र : प्रबोध : 03 र्णउत्ती) 03 (प्रवीण : 19 (प्राज्ञ : 313 र्णउत्ती) 1

सेंट्रल बैंक युनाईटेड बैंक ऑफ इंडिया, केंद्रीय विद्यालय, ओ.सी.जी.एन., वर्ष वन अनुसंधान संस्थान एवं पंजाब नेशनल बैंक से प्रशिक्षण हेतु नियमित 201 प्राइवेट नामित किए गए तथा नवम्ब /4 को आयोजित परीक्षा में भाग लिया। कुल प्रशिक्षित आकडे दर्शाए गए हैं।

निस्ट, जोरहाट में गठित राजभाषा कार्यान्वयन समिति की बैठकें (राकास) :

प्रावदान के अनुसार संस्थान में प्रभावी राजभाषा कार्यान्वयन समिति गठित है। नियमानुसार प्रत्येक तीन माह में बैठक आयोजित की जाती है एवं कार्यान्वयन की मोनिटिंग भी की जाती है। इस वित्तीय वर्ष में उल्लेखित तिथि

30/06/2014, 29/08/2014 एवं 04/03/2015 को बैठक आयोजित की गई एवं महत्वपूर्ण निर्णय लिए गए।

नगर राजभाषा कार्यान्वयन समिति (नराकास), जोरहाट की बैठकें

नगर राजभाषा कार्यान्वयन समिति (नराकास), जोरहाट भारत सरकार, गृह मंत्रालय, राजभाषा विभाग, नई दिल्ली द्वारा बड़े बड़े शहरों में अवस्थित केन्द्र सरकार के कार्यालयों में राजभाषा हिंदी के प्रयोग को सुनिश्चित करने के उद्देश्य नगर राजभाषा कार्यान्वयन समिति की स्थापना की जाती है। बड़े एवं सक्षम कार्यालय के प्रधान को अध्यक्ष नामित किया जाता है। स्थानीय सभी केंद्रीय कार्यालय इसके सदस्य होते हैं एवं प्रत्येक वर्ष दो बार इसकी बैठक आयोजित की जाती है।

वर्ष यन समिति में भारत सरकार ने नगर राजभाषा कार्यान्व 2009, जोरहाट का कार्यभार निदेशक, निस्ट, जोरहाट को सौंपा तथा सचिवीय कार्य हेतु श्री अजय कुमार, प्रभारी, राजभाषा, निस्ट, जोरहाट का नामित किया। स्थानीय केंद्रीय कार्यालय, सैन्यसंगठन, वायु सेना, राष्ट्रीयकृत बैंक, स्वायत्तसेवी संस्थान, प्रतिष्ठान, परिषद समिति के सदस्य हैं जो नियमित आयोजित बैठक में राजभाषा हिंदी पर चर्चा के लिए भाग लेते हैं।

समिति की 28 वीं बैठक: नगर राजभाषा कार्यान्वयन समिति, जोरहाट की 28 वीं बैठक गुरुवार 27 नवम्बर 2014 को संपन्न हुआ। भारत सरकार, राजभाषा विभाग गुवाहाटी कार्यालय के अनुसंधान अधिकारी श्री बदरी यादव की उपस्थिति में बैठक आयोजित की गयी। डा. डी रमैया, निदेशक, निस्ट, जोरहाट ने बैठक की अध्यक्षता की। इस अवसर पर नराकास बैठक की अध्यक्षता कर चुके निस्ट, जोरहाट के उत्कृष्ट वैज्ञानिक डॉ. आर सी बरुआ भी उपस्थित थे।

पूर्व निर्धारित तय कार्यक्रम के अनुसार बैठक अपराहन 3.00 बजे आरंभ हुआ एवं कार्यक्रम का संचालन समिति के सचिव श्री अजय कुमार ने किया। समिति के अध्यक्ष डा. डी रमैया ने उपस्थित कार्यालय प्रधान एवं प्रतिनिधियों का हार्दिक स्वागत किया गया। भारत सरकार, राजभाषा विभाग के प्रतिनिधि स्वरूप पधारे अतिथि अनुसंधान अधिकारी श्री बदरी यादव को फुलाम गमोछा से स्वागत किया गया। उपस्थित कार्यालयों ने अपना परिचय दिया। राजभाषा हिंदी का कार्यालयों में प्रगति पर चर्चा के दौरान सभी कार्यलयों ने अपने-अपने प्रयास, प्रोत्साहन गतिविधियां एवं आने वाली समस्याओं को समिति के सामने रखा। सचिव ने टिप्पणी करते हुए,

उनके बेहतर प्रयास को सराहा एवं समस्याओं के समाधान का आश्वासन दिया। सात ही सभी कार्यालयों से अनुरोध किया कि भारत सरकार राजभाषा नियम का सख्त अनुपालन करते हुए अपने-अपने कार्यालय के होर्डिंग, बोर्ड आदि त्रिभाषी अर्थात् सबसे ऊपर असमियाँ, उसके बाद हिन्दी एवं अंत में अँग्रेजी का प्रयोग करें। असमियाँ संबिधान की आठवीं अनुसूची कि भा. I है इसलिए होर्डिंग में सबसे ऊपर असमियाँ होगा और यह भी कहा कि तीनों भाषा समान आकार में उल्लेखित होना चाहिए। वस्तुतः भारत सरकार का प्रावधान है जिसे सभी केंद्र सरकार के कार्यालय को पालन करना अनिवार्य है। वर्ष 2013 के दौरान बैठक में जोरहाट एयरपोर्ट निदेशक ने भाग लिया एवं अपने विचार समिति के समक्ष प्रस्तुत किया। केंद्रीय रिजर्व पुलिस बल के कमांडेंट श्री नेलसन वसुमतारी ने अपने कार्यालय में हिन्दी के विस्तृत प्रयोग का विवरण दिया। बी एस एन एल के उप महा प्रबन्धक श्री आर के हजारिका ने हिन्दी के प्रति प्रतिबद्धता को दोहराया। दूरदर्शन प्रसारण केंद्र के उपनिदेशक श्री पवन तुली, केंद्रीय औद्योगिक सुरक्षा बल से सहायक कमांडेंट श्री



नगर राजभाषा कार्यान्वयन समिति, जोरहाट की 28 बैठक गुरुवार 27 नवम्बर 2014

राजीव कुलहरी, भारतीय सेन 41 सव एरिया से सूबेदार एल पी शर्मा, सेंट्रल बैंक ऑफ इंडिया के राजभाषा अधिकारी श्री रोशन पांडे, भारतीय स्टेट बैंक जोरहाट उत्तर के राजभाषा अधिकारी सुश्री रुबी कुमारी, भारतीय जीवन बीमा निगम के सहायक प्रशासनिक अधिकारी श्री भृगु कुमार बोरा, यूनाइटेड बैंक के राजभाषा अधिकारी श्री संजय गोंड, यूको बैंक के राजभाषा अधिकारी श्री उदीप कुमार वर्मा ने भी अपने विचार समिति में रखा। केंद्रीय मूगा एवं एरी अनुसंधान, छाया बोर्ड, भारतीय खाद्य निगम, डाक विभाग, नेशनल इनशुरेंस, बैंक ऑफ महाराष्ट्र के प्रतिनिधि ने भी भाग लिया एवं अपने कार्यालय के हिन्दी प्रगति को प्रस्तुत किया।

अपने मार्गदर्शन के दौरान उप निदेशक श्री पुर्ति ने कार्यालयों से राजभाषा विभाग : वेब आधारित सूचना प्रबंधन प्रणाली को अपनाने का अनुरोध किया साथ ही कार्यान्वयन कार्य राजभाषा नियम के अनुरूप करें ताकि लक्ष्य पूरा किया जा सके कार्यालयों में राजभाषा हिन्दी के बेहतर कार्यान्वयन के लिए समिति के अंतर्गत एक उपसमिति बनाने का निर्णय लिया गया जो समय समय पर कार्यालयों में जाकर हिन्दी में प्रगति को देखेंगे। इससे कार्यालय को सहयोग मिलेगा और निरीक्षण भी होगा। समिति के सदस्य कार्यालयों के सहयोग से तैयार छमाही पत्र "अनुनाद" ई-पत्रिका के द्वितीय अंक का विमोचन किया गया। पत्रिका प्रकाशन पर सदस्यों ने संतुष्टि प्रकट की। हिंदीतर भाषी के लेख, कविता आदि का इस पत्रिका में प्रकाशन उनके लिए प्रोत्साहन स्वरूप है। समिति के अध्यक्ष डॉ. डी रमैया ने अपने अध्यक्षीय सम्बोधन में हिन्दी के विकास पर संतोष व्यक्त किया एवं बेहतर कार्य करने का अनुरोध किया।