

# CSIR NEWS



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Team CSIR



## Release of New Certified Reference Materials (Bharatiya Nirdeshak Dravyas)

Shri Ajay Shankar, Secretary, Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India and Shri Sunil Kant Munjal, Chairman, Hero Corporate Services Ltd, released three new Certified Reference Materials (CRMs) of two categories as per following details on 5 November 2007, in the inauguration session of 10th Asian Symposium on Precision Forging held at India Habitat Centre, New Delhi:

1. BND 3404.01 Plain Carbon Steel (composition 1)
2. BND 3405.01 Plain Carbon Steel (composition 2)
3. BND 3301.01  $\alpha$ - Alumina Internal Standard

CRMs of plain carbon steel and  $\alpha$ -Alumina will be used in optical emission and X-ray spectrometric methods of analysis respectively. CRM of plain carbon steels has been prepared at National Metallurgical Laboratory (NML), Jamshedpur; and analyzed at seven laboratories namely Bokaro Steel Plant, Bhilai; Metal Power, Mumbai; National Metallurgical Laboratory, Chennai; National Metallurgical Laboratory, Jamshedpur; Steel Authority of India Limited, Durgapur; Tata Steel, Jamshedpur and Usha Martin, Jamshedpur.



Release of certified reference materials of plain carbon steel and  $\alpha$ - Alumina: Seen (from left) are: Dr Anil K. Gupta, Scientist, NPL; Shri Sunil Kant Munjal, Chairman, Hero Corporate; Dr Vikram Kumar, Director, NPL and Shri Ajay Shankar, Secretary, Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India



The certified reference material of  $\alpha$ -Alumina Internal Standard was prepared at NPL and analyzed at 12 laboratories including three in foreign countries, viz. Central Fuel Research Institute, Dhanbad; Centre of Excellence for Structural and Chemical Characterization, Hyderabad; Centro Nacional de Metrologia (CENAM), Philippines; Indian Institute of Chemical Technology, Hyderabad; Indian Institute of Petroleum, Dehra Dun; Institute of Minerals and Material Technology, Bhubaneswar; National Aerospace Laboratories, Bangalore; National Chemical Laboratory, Pune; National Metal and Materials Technology Center (MTEC), Thailand; National Metrology Laboratory (SIRIM), Malaysia; National Physical Laboratory, Delhi; and National Thermal Power Corporation, Noida.

New properties certified for these CRMs are given in Tables 1 and 2.

**Table 1 : Certified values of elements (% by wt.) in CRMs of plain carbon steel. Estimated uncertainty at confidence level 95%**

Element/ Sample	Carbon	Silicon	Manganese	Phosphorus	Sulphur	Chromium	Nickel
<b>BND</b>	0.17 ±	0.19 ±	0.66 ±	0.025 ±	0.021 ±	0.010 ±	0.007 ±
<b>3404.01</b>	0.02	0.04	0.04	0.004	0.002	0.002	0.002
<b>BND</b>	0.57 ±	0.19 ±	0.80 ±	0.037 ±	0.043 ±	0.081 ±	0.031 ±
<b>3404.01</b>	0.02	0.04	0.08	0.008	0.004	0.002	0.002

**Table 2 : Certified relative intensity data of  $\alpha$ -Alumina**

(hkl)	FWHN In degree	Relative Intensity	Uncertainty $k = 2$ (Confidence level 95%)
012	0.064	61.51	10.34
104	0.064	93.05	8.62
110	0.063	38.52	4.26
113	0.063	99.34	1.44
024	0.073	43.45	4.18
116	0.081	87.96	15.0

**Lattice Parameter (Å)**

$a = 4.7736 \pm 0.0034$ ;  $c/a = 2.72185$ ;  $c = 12.9930 \pm 0.0022$

Nearly 200 scientists and metallurgists including 50 foreign participants attended the

programme. By inclusion of these materials the total number of CRMs available at NPL has increased to 36.

## Flight Test Bed for Autopilot Control for BLIMP

**P**roject BLIMP has developed a Flight Test Bed (FTB) with dual controls for a split rudder surface, twin elevators and flaps to enable radio control of servos at two different frequencies (two independent receivers) to build redundancies, as well as to test autopilot systems for both radio control and autonomous operations. It is also intended to employ the FTB's of this kind for the development of MAV configuration as well as its applications.



## Propargyl glycosides as stable glycosyl donors

For a long time, carbohydrates are solely thought to be as energy sources and protective agents. Carbohydrates in the living cell are often polymers comprising various monosaccharide units linked together by a glycosidic bond. For example, starch is a polysaccharide of a simple monosaccharide, glucose. However, the field of glycobiology, which encompasses the studies on the relevance of carbohydrates in the living cell, has highlighted their importance in many biological events such as metabolism, cell-cell recognition, cell adhesion, viral and bacterial infection, immune response, etc. A major hindrance to the understanding and eventual modulation of these biosynthetic pathways is the access to pure, well-defined oligosaccharides and glycoconjugates. Isolation of these biomolecules from natural sources is a complicated task and often laborious and time consuming. Hence, chemical synthesis is the most sought after way to produce these.

In this background, several protocols have been developed for the synthesis of glycoconjugates over the past century. However, the chemical synthesis of glycoconjugates is still a formidable task in spite of several elegant established methods. Recently, Dr Hotha and Shri Kashyap from the National Chemical Laboratory (NCL), Pune, have reported a novel transglycosylation methodology exploiting gold catalyst. A competing reaction in diversity oriented syntheses pathway development programme enabled them to identify the peculiar behaviour of propargyl group in the presence of Au(III) salts. Extrapolation of this observation led to a novel transglycosylation protocol for the glycoside and disaccharide synthesis. The procedure developed by Hotha and Kashyap facilitates conversion of stable propargyl glycosides to transglycosylated products in the presence of catalytic quantity of AuCl<sub>3</sub> in acetonitrile. The NCL

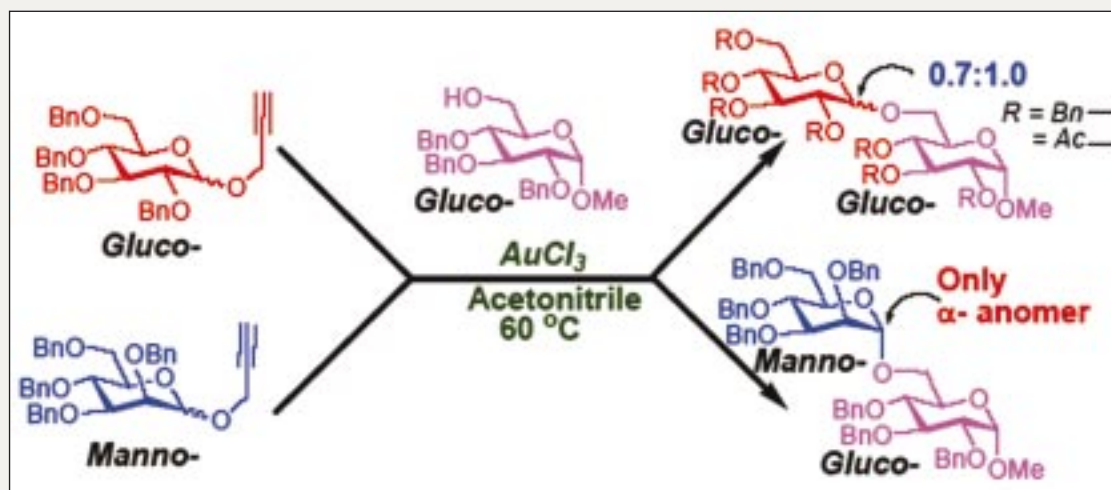
researchers have demonstrated the utility and efficacy of the transglycosylation using various aglycones and synthesized the respective glycosides and disaccharides. It can be envisioned that transition metal mediated activation of propargyl glycosides would be advantageous as propargyl glycosides can be (i) synthesized from aldoses by modified Fisher glycosidation, (ii) stable to diverse chemical manipulations, (iii) directly used for saccharide coupling, and (iv) chemoselectively activated. The scientists are further improving the stereoselectivity of the glycosylated product, exploiting the transglycosylation protocol for the synthesis of carbohydrate-based drugs and vaccine candidates.

Maurya, S. K. and Hotha, S. *Tetrahedron Lett.* 2006, 47, 3307-3310

Hotha, S. and Kashyap, S. *Tetrahedron Lett.* 2006, 47, 2021-2023

Hotha, S. and Kashyap, S. J. *Am. Chem. Soc.* 2006, 128, 9620-9621

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### MoU between NAL and BiSS

**B**angalore Integrated System Solutions Private Limited (BiSS), Bangalore, has entered into an agreement with the National Aeronautical Laboratories (NAL), Bangalore, on 10 January 2008 for collaborative working in areas of aerospace. BiSS is a leading manufacturer and exporter of testing machines like desktop fatigue testing machine, servo-controlled hydraulic test systems, controllers for old UTM, shake table and shock absorbers testing machines.

Expressing his views, Dr Sunder, Director, BiSS, noted that execution of the MoU with NAL is a matter of pleasure and not a pressure.

### NAL-Amrita Vishwa Vidyapeetham MoU

**A**n MoU has been signed between Council of Scientific & Industrial Research represented by National Aerospace Laboratories, Bangalore, and Amrita Vishwa Vidyapeetham, Ettimadai, Coimbatore, on 8 December 2007, for co-operative programme in training and research in areas to be mutually decided by both the parties.

### Technologies developed, Processes licensed and Patents filed by CECRI

**T**he technologies developed, processes licensed and patents sent for filing by the Central Electrochemical Research Institute (CECRI), Karaikudi, during July-December 2007, include:

#### Technologies developed

- Protective coatings formulation for textile industries
- Protective coatings formulation for sugar industries
- Electrochemical conversion of potassium manganate to potassium permanganate

#### Processes licensed

- Electrochemical conversion of potassium manganate to potassium permanganate to M/s Impel Rasayan (P) Ltd, Vishrambag, Sangli for a lumpsum premium (LP) of Rs 1,00,000
- Electrolytic regeneration of spent acidic cupric chloride etchant with simultaneous recovery of copper to M/s AT & S Pvt. Ltd, Nanjangud for Rs 10,00,000 (LP)
- Self sustained PEM portable fuel cell system to M/s Genex Science & Technology Pvt. Ltd, Mumbai for Rs 15,00,000 (LP)
- High performance moisture compatible corrosion resistant protective coating system to M/s Krishna Conchem Pvt. Ltd, Mumbai; M/s Enem Polymers, Pune; M/s Sunil Enterprises, Bangalore for Rs 50,000

#### Patents sent for filing (in India)

- Novel primer paint for corrosion protection of magnesium alloy, S. Sathiyarayanan, S. Syed Azim, G. Venkatachar

## MERADO acquires Advanced Manufacturing Facility

A 5 Axis CNC Milling Machine (DECKEL MAHO, Model No.: DMU 80 MONOBLOCK) has been installed at the Mechanical Engineering Research and Development Organization (MERADO), Ludhiana, to meet the challenges of prototype development. The main features of the machine are:

- a Simultaneous 5-axis high speed machining.
- b With the integrated CAD software (Hyper Mill 9.5), capacity to machine free form or intricate shapes.
- c The travel limitations are:
  - \* Size  $830 \times 650 \times 650$
  - \* Rotary Table Dia 700
  - \* NC swivel Head  $-30/+120$

With this facility, the quality products (prototypes and intricate components) may be developed with reasonable cost and time. The facility may be exploited for development of tooling, free form and intricate shapes, i.e. impellers.

The high speed machining facility is a powerful tool with an artisan. Provided the CAD data are available, the replications of the Art is possible. In a nutshell, it is an excellent manufacturing facility available for entire CSIR family and industry for exploitation. MERADO with its expertise is committed to provide support to industry and CSIR laboratories for development of free form and intricate components, prototypes and tooling, etc.

The support may be requisitioned at [merado@cmeri.res.in](mailto:merado@cmeri.res.in);  
Fax. No.: 0161-2491572, 2504917; Ph: 2504917



5 Axis CNC Universal Milling Machine

## Inauguration of Road Built based on IIP Technology

The Indian Institute of Petroleum (IIP), Dehra Dun, has developed a technology for constructing heavy load-bearing, durable roads, good for the populace. Using this technology, a one-kilometre long test section of road has been built on the Delhi-Yamunotri stretch at Km No. 223-224 by the Public Works Department, Uttarakhand. The leader of the project related to the development of this technology is Shri Umesh Chandra Gupta, Scientist, IIP. According to him the heavy traffic on this section was the reason behind the choice for this particular piece on which mostly heavy vehicles ply, carrying commercial goods and heavy machines, road material and other industrial products up to Selaqui.

IIP the the bitumen required along with the technology which uses a recipe of polymers for construction of this section. Besides this, the whole work was monitored by IIP and the Central Road Research Institute (CRRI), New Delhi. The construction work was completed in May 2007. This section of the road will continue to be monitored by CRRI for three years, especially after the rainy season. This study conducted at IIP was funded by the Centre for High Technology, New Delhi.

Dr K. S. Balaraman, Executive Director of the Centre for High Technology, New Delhi, inaugurated the test section on 23 November 2007. Dr M. O. Garg, Director, IIP, and Project Leader Shri Gupta were present on this occasion. Shri M. G. Pushkarana, Superintending Engineer, PWD, Uttarakhand, Executive Engineers



Shri Sant Ram and Shri K. V. Upreti and the Scientists from the CRRRI Dr (Smt.) Sangeeta Singh and Shri Surendra Kumar were also present.

Talking about the importance of the technology developed by IIP, Dr M. O. Garg underlined the role of scientific knowledge in the construction of roads and said that owing to want of scientific knowledge in the conventional road-construction, polymers are not used in the required and proper ratio, right temperatures are not maintained, nor is the composition of bitumen taken care of while mixing the polymers as the full miscibility of polymer in bitumen is not known. It is because of this that the roads do not remain durable. All this has been taken care of in the technology developed by IIP.

## Meeting for Review of Bharatiya Nirdeshak Dravyas (BNDs) Programme

A meeting to monitor the progress of 'Preparation and Dissemination of Bharatiya Nirdeshak Dravyas (BNDs) (Certified Reference Materials) Programme' was held at the National Physical Laboratory (NPL), New Delhi, on 5-6 November 2007 under the Chairmanship of Dr Vikram Kumar, Director, NPL. Nearly 50 scientists from 21 partner laboratories namely NGRI and IICT in Hyderabad; NBRI, ITRC and CDRI in Lucknow; CIMFR, Dhanbad; CFTRI, Mysore; IMMT, Bhubaneswar; CSMCRI, Bhavnagar; NEERI, Nagpur; IIP, Dehra Dun; NML, Jamshedpur; NIO, Goa; IIIM, Jammu; NEIST, Jorhat; NPL, New Delhi; IOC, Faridabad; IPFT, Gurgaon; NTH, Ghaziabad; NTPC, Noida and IARI New Delhi, attended the meeting. Shri Anil Relia, Quality Manager, National Accreditation Board of Testing and Calibration Laboratories (NABL), also attended.

In his welcome address, Dr Vikram Kumar expressed his happiness over the overwhelming participation from the partner laboratories. Dr Kumar pointed out that CRMs programme, which is nearly 20 years old, now has the participation of 35 reputed laboratories of the country. The programme got good financial support during the Tenth Five Year Plan (TFYP). He was happy over the extension of this programme in the areas of bio analysis, food and petroleum with



Shri Prabhat K. Gupta presenting the report at review meeting of Preparation and Dissemination of Certified Reference Materials. Seated on dais (from left) are: Dr Vikram Kumar, Director, NPL; Dr B.R. Chakraborty, Head, Materials Characterization Division and Dr A.K. Agrawal, Coordinator, CRM programme

the participation of CDRI, CFTRI and IIP, respectively. He said that it is the right time to implement ISO 17025, 34 and 35 in the laboratories for international acceptability of the CRMs being prepared under this programme. He wished that this programme would grow faster and create a good impact at national and international level. Dr Kumar called upon the laboratories, who had not provided so far, their inputs for the Eleventh Five Year Plan (EFYP), to do so at the earliest.

Dr B.R. Chakraborty, Head, Materials Characterization Division, welcomed the participants and said that in the era of globalization, quality assumes great significance, which could be ascertained by good measurements. Adoption of ISO-17025, 9000, etc. is the driving force for using the CRMs in measurements. He called upon the partner laboratories to continue to provide dedicated support for the success of this programme.

Shri Anil Relia in his address said that

NABL is the national accreditation body set up by Government of India to provide third party accreditation to the testing and calibration laboratories. For accreditation, it assesses the competence and implementation of the quality system, i.e. ISO-17025 in the laboratory. He informed that NABL had signed memorandum of understanding (MoU) with Asia Pacific Laboratory Accreditation Cooperation (APLAC) and International Laboratory Accreditation Cooperation (ILAC) for international acceptability of test and calibrations reports issued by NABL accredited laboratories. Similarly, national metrology institutes like NPL had signed MoU with international metrology institutes for traceability in measurements. He told that this CRM programme is providing help to the accredited laboratories but the number of CRMs (37) available at NPL is very small. Most of the CRMs are being still imported in the country. He appealed to the

participants to prepare more CRMs and get accreditation under ISO 34 for international recognition. NABL is also planning to start the activity of grant accreditation to the CRM producers.

Shri Prabhat K. Gupta, Head, Analytical Chemistry Section, NPL, briefed about the road map of the programme on Metrology in Chemistry and Certified Reference Materials.

Dr A.K. Agrawal, Coordinator, Programme on Preparation and Dissemination of Certified Reference Materials, informed that Shri Ajay Shankar, Secretary, Department of Industrial Policy and Promotion, Ministry of Commerce and industry, Government of India, and Shri Sunil Kant Munjal, Chairman, Hero Corporate Services Ltd, had released three new Certified Reference Materials of two categories namely metals and alloys and X-ray diffraction on 5 November 2007 in the Inauguration Session of 10th Asian Symposium on Precision Forging at

India Habitat Centre, New Delhi.

He also informed about the release of six new CRMs of mono elemental solutions and four pesticides on 13 December 2006 in the Inaugural Symposium of Asian Pacific Metrology Programme (APMP) General Assembly and related meetings by Dr Robert Kaarls, Secretary Comite International des Poids et Mesures (CIPM) and Chairman Consultative Committee on Amount of Substance, CCQM and Shri G.J. Gyani, Secretary General, Quality Council of India. These new CRMs are given in the boxes.

Dr Agrawal further said that with these, the number of CRMs available at NPL has increased to 36.

Reports of the nodal scientists of different areas of CRMs were then presented and are summarized as follows:

1. Petroleum Standard: Dr O.S. Tyagi informed that his laboratory will prepare several CRMs of petroleum. They are getting funds under EFYP in



Participants of the Meeting on Preparation and Dissemination of Certified Reference Materials





## Mono Elemental Solutions

Lead Solution (BND 105.01) - concentration 5.01 + 0.04 mg/l  
Cadmium (BND 205.01) - concentration 5.00 + 0.04 mg/l  
Zinc (BND 1205.01) - concentration 5.00 + 0.04 mg/l  
Iron (BND 1305.01) - concentration 5.00 + 0.04 mg/l  
Copper (BND 1405.01) - concentration 5.01 + 0.04 mg/l  
Cobalt (BND 2205.01) - concentration 5.01 + 0.04 mg/l

## Pesticides

Chlorpyrifos (BND 1701.02) - purity 99.08 + 1.28%  
Isoproturon (BND 2001.02) - purity 99.10 + 1.4%  
Fenvalerate (BND 3101.01) - purity 99.09 + 0.94%  
Cypermethrin (BND 3201.01) - purity 99.09 + 0.82%

Hexaconazole, Malathion, Chloramphenicol, Monochrotophos, Erythromycin, Profenophos, Neomycin, Quinalphos, Tetracycline, Deltamethrin, Oxy-tetracycline, Lambda-cyhalothrin, Furazolidone, Metalaxyl, Furatadone, Imidacloprid, Nitrofurantion, Dichlorovos and Nitrofurazone. Dr Rakesh Kumar informed that CRMs of mixed organochlorine pesticides, e.g. HCH and its isomers, Aldrin, Endosulfan, DDT and its metabolites, Pb, Cd and Mn in biological materials are proposed to be prepared.

Dr V.T. Gajbhie informed that they propose to prepare CRMs of Endosulfan, Atrazine, DDT, Deltamethrin and their isomers and metabolites. One compound pp-DDT has been purified and handed over to NPL for round robin testing for certification of its purity.

Dr M. Vairamani said that a large number of CRMs of the pesticides are needed in the country. So far these are being imported. Stressing for stronger cooperation among the partner labs, he said that Institute of Pesticide Formulation Technology would be happy to join this group. He assured to send the proposal to NPL shortly.

5. Metrology in Air Pollutants: Dr D.G. Gajghate informed that NEERI, Nagpur, has proposed to initiate the studies on air pollution source apportionment in major urban cities in which several source of specific

the NPL's network project on Advances in Metrology to upgrade the existing facilities and create new facilities enabling metrology pertaining to petroleum. Various CRMs namely bio diesel, long-chain pure fatty acid methyl esters (FAMES) C14-C18; low-sulfur diesel oil having low lubricity characteristics; viscosity oil (viscosity range 0.5 to 12 cst; virgin lube oil containing metals namely Na, Ca, P, Mg, and Zn; used lube oil containing metals namely Ag, Al, As, Cd, Cr, Cu, Fe, Mg, Mo, Na, Ni, P, Pb, Si, Sn, Ti, V, and Zn; blend of pure FAMES in petroleum diesel, etc have been projected in the plan.

2. Food Materials: Dr M.N. Manjunath, Scientist, CFTRI, told that CFTRI during EFYP will prepare CRMs of edible materials. They will establish metrology facilities for measurement of various properties in food. Several CRMs of Cauliflower/Cabbage powder will be prepared to certify the concentration of some

specific pesticides. Similarly CRM of Spinach powder will be prepared to certify the concentration of some toxic metals like Pb and Cd.

3. Reference Standards from Potentially Bioactive Plants: Dr D.K. Dikshit briefed the members about the metrological activities to be initiated at CDRI, under this programme. He said that in this activity Phyto-estrogens, Phyto-sterols and Flavonoids will be isolated from natural sources and purified for creation of reference materials' library and database from potentially bioactive plants. These reference standards may be used for absolute quantification, finger printing/pattern profiling in any plant of interest or of medicinal/nutritional value and purity check and quality control.
4. Pesticides/pharmaceuticals: Dr R. Nageshwar Rao, Scientist, IICT, Hyderabad, told that during EFYP they propose to prepare the CRMs of following pesticides/drugs: Endosulphan,



- markers like metals, organic compounds, PAH, OC/EC and cation/anions would be analyzed for assessment of source contributions by various receptor models. CRMs required for these parameters would be prepared under this programme.
6. Ozone Primary Standard: Dr B.C. Arya, Scientist, NPL, informed that they are working for procurement of a Standard Reference Photometer (SRP), a primary tool to measure the concentration of ozone at ground level from National Institute of Standards and Technology (NIST), USA. The NIST had developed this system in 1980s and supplied it to several economies.
  7. SEM/TEM Resolution Standards: Dr Ramkishore, Scientist, NPL, briefed the members that his laboratory is working on the preparation of gold nanoparticles for using them as Resolution Test Standards (CRMs) for Transmission Electron Microscope. He presented the progress made in this regard so far.
  8. Geochemical Reference Materials: Dr V. Balaram, Scientist, NGRI, Hyderabad, informed that earlier they had prepared and released a CRM of high-grade gold geochemical reference material with the support of M/s Hutti Gold Mines Company Limited (HGML), Bangalore. Similar to this he had submitted a project proposal in collaboration with NPL to them for preparation of medium and low-grade gold geochemical reference materials. The proposal has been accepted by HGML in principle.
  9. Plain Carbon Steel: Dr K.K. Gupta informed that six samples of plain carbon steel with different concentration of carbon, silicon, manganese, phosphorus, sulphur, chromium and nickel had been prepared at NML, Jamshedpur. Of these two materials were found suitable for release after round robin testing and statistical evaluation of the data. He mentioned that more CRMs of steel are under preparation.
  10. Ultrasonic Velocity: Dr Yudhister Kumar, Scientist, NPL, informed that they are planning to prepare the reference material for ultrasonic velocity in solids. So far, no Standard Reference Material is available for velocity measurement. It is required by a large number of industries, universities, etc.
  11.  $\alpha$ -Alumina: Dr S.K. Halder, Scientist, NPL, briefed the members about the preparation, certification and release of the  $\alpha$ -alumina internal standard for quantitative analysis. He said that it is for the first time that national laboratories of three foreign laboratories namely Centro Nacional de Metrologia (CENAM), Philippines; Metal and Materials Technology Center (MTEC), Thailand; and National Metrology Laboratory (SIRIM), Malaysia, participated in round robin testing for its certification along with nine Indian laboratories. He also mentioned that CRMs of  $\text{LaB}_6$ , ZnO and  $\text{TiO}_2$  are proposed to be prepared under EFYP.
  12. Surface Area: Dr R.S. Shukla, Scientist, CSMCRI, Bhavnagar, informed that they propose to synthesize the CRMs of mesoporous materials. XRD, NMR, SEM, FT-IR, and nitrogen absorption techniques will be used for their characterization. After the studies on their durability and stability, material would be sent to the several laboratories for round robin testing.
  13. Elemental Solutions: Dr A.K. Agrawal informed that CRMs of two multi elemental solutions consisting of Cu, Fe, Zn and Pb, Cd, Ni and mono elemental solutions of chromium, arsenic, silver and potassium are ready for round robin testing.
- Future Programme**
- Future roadmap of the programme was discussed under the chairmanship of Dr B.R. Chakraborty. It was agreed that every laboratory would start working on preparation of quality documents to meet the requirement of ISO 17025. Lead laboratories of each satellite group will strengthen infrastructure for metrology in chemistry in their area and participate in key comparison programme for traceability. Dr Agrawal informed that earlier database of the contact persons requires updating.
- Shri Prabhat K. Gupta proposed the vote of thanks.



### Workshop on 'Industrial Perspectives of Bioinformatics'

A one-day workshop on Industrial Perspectives of Bioinformatics was held at Indian Institute of Chemical Technology (IICT), Hyderabad, on 13 December 2007 for the benefit of the students of the ongoing course of Advanced Course in Bioinformatics, jointly organized by IICT, CDAC and JNTU. The objective was to make the students of the course understand the importance of Bioinformatics in the present scenario of Research and Development.

The workshop was inaugurated by Dr J.S. Yadav, Director, IICT. In his address, Dr Yadav observed that the area of research has become interdisciplinary and the field of Biology has got a very important role to play in serving the mankind with equal contributions from the field of Chemistry and Information Technology and hoped that the deliberations at the workshop will be beneficial to the students.

The course coordinator Dr U.S.N. Murty in his address pointed out that the field of Bioinformatics not only combines Biology and Information Technology but also has another eight important science disciplines contributing in a major way for the explosive growth of the field of Bioinformatics.



Dr J.S. Yadav, Director, IICT, giving his inaugural address at the workshop on Industrial Perspectives in Bioinformatics. Others seen on the dais are: Dr (Ms) Madhavi Sastry, Dr U.S.N. Murty, Dr V. Balaji and Dr Gopalakrishnan

The speakers for the one-day workshop were: Dr Balaji, Jubliant Biosciences, Bangalore; Dr Gopalakrishna, TCS, Hyderabad; Dr (Ms) Madhavi Sastry, DE Shaw, Hyderabad and Dr Ashwin Shiv Kumar of Ocimum Biosolutions, Hyderabad. The guest faculty for the workshop has been playing an important role in the area of Bioinformatics and includes pioneers in the Indian scientific context. The speakers gave an overall view of the present scenario of Bioinformatics and said that the future would be very bright for those who take it up as a career. Dr Ashwin Shiv Kumar also discussed how to plan their career.

### Science Writers' Workshop at NEIST

The Assam Science Writers' Association under the presidentship of Dr P. C. Tamuly, Scientist, NEIST, organised a one-day workshop on 'Science for all' for the science writers and science journalists on 14 October 2007 at North East Institute of Management Science (NEIMS), Jorhat. Dr P. G. Rao, Director, NEIST, Jorhat, inaugurated the workshop and delivered the inaugural lecture. Dr D. C. Goswami, Adviser, NEIST, delivered the keynote address. Dr Bolin Khargharia, former Superintendent of JDS Civil Hospital, Jorhat, Dr M P Borthakur, Professor of AAU and Dr P. C. Tamuly, Scientist, NEIST, spoke on the topics 'Health for All', 'Agriculture' and 'Superstition' respectively.

## First Workshop to commemorate IYOR 08

India heralds celebration of International Year of the Coral Reefs 2008 (IYOR 08) was organized. The first of the three national workshops planned to commemorate the IYOR during 21-23 January 2008 at Kadamat Island, the Lakshadweep. Named Stapcor 08 (Status and Protection of Coral Reefs 2008). This workshop brought together 49 participants including reef researchers, managers, policy makers, protection enforcement agencies, social workers and students. The three-day workshop covered six themes:

1. Evolution of the recovery of the reefs after 1998
2. Strategies for strengthening of Management Action Plans
3. Science and Technology needed for management
4. Capacity building
5. Biodiversity of reefs other than corals
6. Societal issues and alternate livelihood options

Each session was a blend of contributed papers and group discussions leading to formulation of recommendations that could be implemented at national and reef-region levels. A total of 29 presentations were made besides screening of videos on current status of corals in India. In addition to formulating a series of recommendations to enhance monitoring, management and rejuvenations strategies, the workshop participants also agreed to implement projects of international relevance like bar-coding of reef organisms.

This workshop was jointly organized by the National Institute of Oceanography and the Administration of the Union Territory of Lakshadweep in India. Indian Ocean - Census of Marine Life (IO-CoML) extended support by enabling participation of 11 students including bright school children.

For further details, please contact Mohideen Wafar at wafar@nio.org

## Workshop on State of the art Transonic Flutter Prediction

The National Aerospace Laboratories (NAL), organized a workshop on 'State of the art Transonic Flutter Prediction' from 24 December 2007 to 4 January 2008. The workshop was inaugurated by Dr A. R. Upadhyya, Director, NAL. Dr Gautam Sen Gupta, Associate Technical Fellow, The Boeing Company, Seattle, USA, External Advisor/Consultant of the programme, conducted the workshop. The programme was sponsored by Department of Science and Technology (DST) under its Collaborative Projects with Scientists and Technologists of Indian Origin abroad programme (CP-STIO Programme). The main objective of the programme was to develop expertise in the area of computational aero-elasticity in the transonic regime.

The topics discussed during the workshop were flutter prediction based on adjusted Doublet-Lattice method, as incorporated in MSC-NASTRAN, ZAERO, for example, any validation/comparison with wind tunnel or flight test data, development of CFD based methods-steady and unsteady, reduction of computing time in CFD-based prediction based on parallel processing and validation of CFD based methods. The participation included leading experts and practitioners from major aerospace industry in India who got together to assess the State of the art of Transonic Flutter Prediction. The session was highly inter-active, discussion-oriented and finally culminated in generating inter institutional programmes in this area of work.

## Quebec Delegation visits NAL

A high level delegation from Quebec, Canada, was at the National Aerospace Laboratories (NAL), Bangalore on 8 January 2008 for a follow up meeting. Dr J. J. Issac welcomed the delegation. Mr Carlos Trindade, Director, Special Projects, Consortium for Research Innovation in Aerospace in Quebec made a brief presentation and Dr Fassi Kafyeke, Senior Engineering Advisor, Director, Strategic Technology, Bombardier Aerospace, spoke on Aerodynamic Design of Improved Winglets for the Bombardier CRJ-900LR Regional Jet. The discussions between the two teams proved very fruitful in strengthening the relationship and identifying projects for joint venture partnership.





## Dr Kakodkar delivers NCL Foundation Day Lecture

**D**r Anil Kakodkar, Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, Government of India, delivered a talk on "Emerging nuclear power programme: Its rationale and perspective" on the occasion of National Chemical Laboratory, Pune's 59th Foundation Day on 3 January 2008.



Dr Anil Kakodkar delivering the NCL Foundation Day Lecture

The total installed capacity for power in India is smaller than the demand, which is growing rapidly. The nation, therefore, has to look for alternative energy technologies. A country of the size of India cannot afford to plan its economy on the basis of large scale import of energy resources or energy technology, remarked Dr Kakodkar.

He said that coal, hydrocarbon, uranium metal in PHWR



Dr S. Sivaram giving welcome address

(Pressurised Heavy Water Reactor), thorium metal (in breeders), hydrogen and renewable energy (solar, biomass) are the resource base for energy in India. While comparing the characteristics of fuel, Dr Kakodkar stated that shortage of uranium would lead to its import. Indian ore contains only 0.06 % of Uranium-235 while that found in Canada, which yields 18%. Uranium provides twenty times more energy per tonne of mined material than coal when the former is used once through open cycle in PHWRs and 1200 to 1400 times more energy per tonne of mined material than coal, when used in closed cycle based on FBRs (Fast Breeder Reactors).

In India, most of the strategies on energy are based on closed fuel cycle, a necessary consideration of energy sustainability and credible

waste management. Direct disposal of spent fuel would create a plutonium mine with indeterminate future consequences.

While talking about the future energy plans, Dr Kakodkar described three stages of nuclear power programme of India, namely, PHWRs (10,000 MWe), fast breed reactors (530,000 MWe) and thorium based reactors with unlimited power potential. India today has 17 reactors in

operation and six reactors are under construction. When completed, India's nuclear power capacity will be ~22000 MWe by 2020. Dr Kakodkar gave a brief overview of the operating nuclear power plants in India. He also expressed confidence that the cost for energy derived from nuclear reactors will be competitive. Dr Kakodkar provided future roadmap for the utilisation of Indian thorium and uranium resources with other sources of energy. He stated that it was time to evaluate newer elements to fill in uranium deficiencies. This would be possible by collating the energies of the newer elements.

Dr Kakodkar stated that nuclear power should contribute to about a quarter of the total electric power required fifty years from now. Consequently, one needs to sustain the momentum of domestic R&D without any external constraints.

In his welcome address Dr

Sivaram took the audience through a nostalgic historical journey and gave a glimpse of the evolution of NCL, laying of foundation stone on 6 April 1947, appointment of the first Director, Professor J. W. McBain, FRS and the inauguration of the laboratory by the first Prime Minister of Independent India, Pandit Jawaharlal Nehru on 3 January 1950.

Dr Kakodkar gave away the NCL Research Foundation Awards including Scientist of the Year Award (Sponsored by Maneckji & Shirinbai Neterwala Foundation) which was awarded to Dr A. Sudalai and Dr Absar Ahmad, Scientist of the Year Award (Sponsored by Dr R. A. Mashelkar Endowment Fund) awarded to Dr Ashok P. Giri, Highest Industrial Earning Award in the form of Rotating Shield & Trophy to Homogeneous Catalysis Division, Award for "New Initiative taken by the R&D Support System" to support staff. Director's Commendation Award and Individual Merit Awards were also presented. In addition, Merit Scholarship Awards to the children of class IV employees of NCL were awarded to fourteen students.

## CSIR Programme on Youth for Leadership in Science at NEIST, Jorhat

Launched in 1999, the CSIR Programme on Youth for Leadership in Science (CPYLS) aims at encouraging the meritorious students of class X from CBSE, ICSE and other Boards to pursue science as a career. The programme is intended to help build a scientific temper at an early stage. Presented here is highlights of the CPYLS held at North East Institute of Science and Technology (NEIST), Jorhat.



On the dais (from left) Prof Sai Prakash, Dr P. G. Rao and Dr R. B. Srivastava

NEIST organized the CPYLS on 15-16 November 2007. Held at NEIST auditorium, the inaugural function of the programme was presided over by Dr P. G. Rao, Director, NEIST. The programme was attended by 86, 10<sup>th</sup> Standard passed top-ranking students from the school boards of eight North East States, namely Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura. Dr R. B. Srivastava, Director, Defence

Research Laboratory, Tezpur, Assam and Prof. P. K. Sai Prakash, Emeritus Scientist (CSIR), Birla Science Centre, Hyderabad, took part as the Chief Guest and Guest of Honour, respectively while the closing function was presided over by Dr D. C. Goswami, Scientist G, NEIST.

Dr R. B. Srivastava gave an illuminating and informative speech on the 21st Century Science and Technology in India and in that connection he also gave the glimpses



of the institutes of higher education, areas of various disciplines of science and technology in these institutes of the country together with the future opportunities available in different disciplines after graduation for benefit of the budding young scientists.

Prof. P. K. Sai Prakash, who is a recipient of Best State Teacher Award 2002 and Best National Teacher Award 2007, also spoke on the occasion.

Earlier, Dr P. G. Rao accorded a warm welcome to the participants. Dr S. Baruah, Scientist of NEIST, delivered a lecture on his adventurous experiences and experiments undertaken during his Antarctica expedition to the delight of the participants.

The participants were then taken round the laboratory for apprising them of the research activities being carried out in the various departments. They were allowed to perform some scientific experiments and take part in an extempore speech competition on science topics. Prof. Sai Prakash was special attraction for the participants for clearing many of their nagging doubts in understanding the scientific principles. The participants were awarded certificates. Prizes were awarded to the winners of semi-extempore speech competition. The student participants and escorts expressed thanks and gratitude to NEIST for holding such an excellent scientific programme.

## Dr Tapan Chakrabarti takes over as Acting Director, NEERI

Dr Tapan Chakrabarti (b.1949) has taken over as Acting Director of the National Environmental Engineering Research Institute (NEERI), Nagpur, w.e.f. 31 January 2008.

Dr Chakrabarti obtained Master's degree and Doctorate in Biochemistry from the Nagpur University. He also qualified the Associate Membership Examination of the Indian Institute of Chemical Engineers (AMIIChE) in Chemical Engineering from Jadavpur University, followed by LLB from Nagpur University. Dr Chakrabarti joined as a scientist at NEERI and rose to become Director Grade Scientist holding the position of Scientist and Head of Environmental Biotechnology Division at NEERI. He has worked in the areas of environmental monitoring and environmental management with special reference to toxic wastewater and hazardous sludges using biotechnological tools, bioremediation of contaminated sites, biotechnological production of value-added chemicals from wastes, genotoxicity of toxic wastewaters and leachates, and toxicogenomics and proteomics. He has successfully carried out the full-scale projects on bioremediation of acrylonitrile contaminated site at Kandla, Gujarat, and stabilization and disposal of 250 cubic meter of ten percent arsenic bearing solution in the state of Goa. He has also



successfully handled various projects with national and international agencies/organizations during his tenure as a scientist at NEERI.

Considering his remarkable contribution and experience in the field of environmental biotechnology, Dr Chakrabarti has been nominated in various national committees. He is presently the Chairman of the Department of Biotechnology Task Force on Biodiversity Conservation and Environment. He has been regularly invited as a faculty member in various workshops organized by CII, FICCI, ICMA, Central and State Pollution Control Boards and other organizations to deliberate on various aspects of hazardous waste management and remediation of contaminated sites. He was also an alternate member of the Supreme Court Monitoring Committee constituted for hazardous waste management in India. Presently, Dr Chakrabarti is coordinating a CSIR Network Project, titled "Remediation/eco-



restoration and clean-up of contaminated ground and surface water resources" involving ten CSIR laboratories, under the Eleventh Five Year Plan.

Dr Chakrabarti has published many research papers in national and international journals having high impact factor and has been awarded several national and international patents. He is a recipient of many awards and honours. Among these, the noteworthy are: Pitamber Pant National Environment Fellowship Award conferred by the Ministry of Environment and Forests, Government of India; Fellowship of the Maharashtra Academy of Sciences; selection as the Country Expert for the survey of hazardous waste management in India by the Asian Productivity Council, Japan and Flora-Tech Award on Environment given by Flora-Tech Laboratory, Nagpur.

## Dr J.S. Yadav's 100<sup>th</sup> Ph. D. Student submits Thesis

The 100<sup>th</sup> student of Dr J.S. Yadav, Director, Indian Institute of Chemical Technology (IICT), Hyderabad, submitted his thesis for Ph. D. in January 2008. It is a rare achievement for a scientist who in a short span of about 25 years' of service in CSIR has guided that many students for Ph. D.



Dr Yadav, after obtaining his Ph. D. in Organic Chemistry from Banaras Hindu University (BHU) in 1976 worked as a post-doc at Houston and Madison in USA for about three and a half years. Later, he joined National Chemical Laboratory (NCL), Pune, in 1981 and then shifted to IICT in 1986. He was elevated as Head of the Organic Chemistry Division (Natural Products & Synthetic Organic Chemistry) in 1989 and later appointed as Director, IICT, in 2003.

In a span of two and half decades of research career, Dr Yadav has been able to successfully carry out extensive basic and applied research investigations in the synthesis of complex natural products of biological relevance. He is a specialist in asymmetric synthesis to create new chiral centers in complex organic molecules and utilize them effectively in the synthesis of many bioactive molecules for example, Hydroxy fatty acid, Discodermalide, Rifamycin, Scytophycin, Calcimycin, Artemisin, Taxol, etc.

Dr Yadav's research group has successfully developed cost effective technologies for specialty chemicals like Diltiazem, Ondasetron, Pyrazinamide, Ketotifen, Mefloquin, Tamoxifen, etc.

They have been very well received by the Indian and overseas drug industries. The global majors like Smithkline Beecham (SB), Dupont, FMC and Ranbaxy, Lupin and Dabur have entered into medium term contract research agreement with his research teams. His research findings have been published in nearly

680 research papers, patents and invited talks.

Dr Yadav is a member of prestigious scientific bodies like Department of Science and Technology Technical Advisory Board (TAB) and a national representative of International Union of Pure & Applied Chemistry (IUPAC).

He has received many academic and industrial awards, viz., Shanti Swarup Bhatnagar Prize (1991), Vasvik Award in Chemical Sciences & Technology (1999), Ranbaxy Research Award in Pharmaceutical Sciences (2000), Prof. Swaminathan 60th Birthday Commemoration Lecture Award (2002), Vigyan Ratna, Vigyan Gaurav Awards of Council for Science and Technology, Uttar Pradesh (2003) & (2004), Goyal Award 2003, JC Bose Fellowship of DST, etc. He is a Fellow of National Academy of Sciences (1993), Indian National Science Academy (1998) and Third World Academy of Sciences, Member of A P Akademy of Sciences (2001). He has to his credit more than 680 research publications in various reputed national and International journals, 20 International Patents and 27 Indian Patents to his credit.



## IITR rechristened as IITR

The Industrial Toxicology Research Centre (ITRC), Lucknow, has been rechristened as the Indian Institute of Toxicology Research (IITR). Announcing this, the IITR Director Dr Ashwani Kumar, at the Stone Unveiling ceremony on 1 February 2008 pointed out that ITRC was established in 1965 to focus on the problems of industrial toxicology. The needs of the centre progressively grew to evaluate GM foods, GM drugs herbal products, nanomaterials and biotoxins. The change in name was recommended by the Performance Appraisal Board of CSIR and this was later approved by the Governing Body of CSIR. "By giving the centre a new name we have broadened the scope of toxicology and also upgraded the centre to the level of an institute."

Dr P.S. Chauhan, Formerly Head, Department of Genetics, Bhabha Atomic Research Centre (BARC), Mumbai, and presently Chairman Research Council of the centre was the chief guest on the occasion. While performing the stone unveiling ceremony, Dr Chauhan said that toxicology is no more the Science of poisons. The domains of toxicology define the levels of safety of a chemical. For over 40 years, the centre has addressed various issues on toxicology and now after getting a new name it has greater



Dr P.S. Chauhan, Chairman, R.C., unveiling the 'stone' rechristening IITR as IITR. Seen with him (from left) are: Dr C.M. Gupta, former Director CDRI & IITR, Dr Ashwani Kumar, Acting Director, IITR, Dr R.C. Srimal former Director IITR and other dignitaries

responsibility to perform. Earlier the toxicology was carried out of the pure compound but now the nature of products have changed. We now have vaccines, recombinant proteins, GM foods and drugs and transgenic plants. He said that the earlier methods for toxicity studies are not appropriate in the present context. He further said that the biggest challenge is to develop sensitive methods to detect toxic agents and also to elucidate the mechanism of toxicity and also to see why certain individuals are

susceptible to the toxic effects of chemicals and some are not. The name change now reflects the paradigm shift in the scope of toxicology.

A distinguished galaxy of scientists from local CSIR laboratories, Former Director's of the Centre, officials of various scientific institutions and personnel from the print and electronic media were present on the occasion. Dr Yogeshwer Shukla, Scientist F of the center, proposed the vote of thanks.

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