



# CENTRAL PULP & PAPER RESEARCH INSTITUTE

केन्द्रीय लुग्दी एवं कागज़ अनुसंधान संस्थान

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News Bulletin on Pulp, Paper and Allied Industries  
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## MANAGEMENT NEWS

### Cess Committee Meeting

A meeting of Cess Committee under Development Council for Pulp, Paper and Allied Industries (DCPPAI) was held on February 20, 2013 at Udyog Bhawan, New Delhi. The meeting was chaired by Shri Talleen Kumar, IAS, Joint Secretary, DIPP, Ministry of Commerce and Industry, Government of India. The meeting was attended by Shri Mukul Ratra, Director, (IF wing), Smt. Sunita Yadav, IES, Dy. Secretary, Dr. R. M. Mathur, Member Secretary & Director CPPRI and other members of Cess Committee as well as special invitees from mill associations, Ministry, CPPRI and other technical institutions. Various issues like action taken on the decisions of last Cess committee meeting, review of the on-going projects, consideration of new proposals for approval etc. were taken up as an agenda for discussion.

## RESEARCH AND DEVELOPMENT ACTIVITIES

### RAC Projects

#### Raw Material and Product Development

#### New Approaches in Processing and Papermaking of Recycled Fibre to Improve the Quality of End Product

Wet end chemicals such as different types of Fillers (Talc, GCC, PCC, Clay etc.), Cationic starch, Cationic gum, Dry and Wet strength additives etc. collected from different sources were analysed for various physical and electrokinetic properties.

#### Energy Conservation & Environmental Management

#### Implementation of Enzyme Application in Pulp & Paper Industry

The objective of the project is to implement the enzyme applications in pulp & paper industry to address clean and green technologies related to energy conservation, quality up-gradation environmental improvement and biofuels from waste

biomass. The project activities include:-

#### ❖ Bioethanol Production from Lignocellulosic Biomass, Bagasse Pith and Rice Straw

Lignocellulosic biomass (rice straw) was collected from a paper mill. CPPRI fractionation methodology to collect different fractions of rice straw. All the fractions were subjected to chemical characterization to estimate the potential of ethanol production from each fraction. Studies on prehydrolysis of bagasse pith and rice straw were initiated.

#### ❖ Development of Indigenous Capabilities for Production of Various Enzymes and Implementation of Biorefining and Biodeinking in Indian Paper Industry

Studies on isolation and screening of microorganisms which produce useful enzymes viz. cellulase/ amylase/laccase etc. were continued with different soils and other degraded raw materials collected from different sources.

#### ❖ Bioremediation of Paper Mill Effluent

Isolation of microbial strains from effluent and sludge samples collected from two paper mills were continued. Eleven nos of strains were selected on the basis of their potential to reduce the pollutional parameters of interest like colour, COD etc..

#### Incremental Capacity Enhancement and Improved Energy Efficiency of Conventional Chemical Recovery System in Wood and Non-wood based Paper Mills

Bench scale studies were completed on a mill black liquor for expansion of chemical recovery system. Studies are continued on other black liquors.

#### Infrastructure Development and Capacity Building Activities

#### Strengthening of training and HRD infrastructure in Pulp, Paper and Allied Industry

Nine Nos of students of M.Tech., B.Tech. and M.Sc. were imparted training in their respective discipline.



## Cess Funded Projects

### An Integrated Approach for Utilization of Bagasse Pith for Production of Bio-ethanol and Value Added Lignin Products (CPPRI/IIP, Dehradun)

The objective of the project is efficient utilization of bagasse pith through development of a process for production of bio-ethanol and value added chemicals. Studies on enzymatic saccharification of pretreated bagasse pith were continued with commercial cellulase enzyme received from reputed Indian enzyme supplier.

### Development of Environmentally Safe Biological Process to Bleach the Bamboo & Wood Pulp using Potential Bacteria (CPPRI/IGIB, New Delhi)

The aim of the project is to develop the environmental friendly bleaching process for biobleaching of wood pulps using ligninolytic bacteria for reduction in the demand of chlorine based bleaching chemicals and improvement in pulp quality.

Studies were continued to improve the efficiency of bacterial treatment to bleach the pulp, which may open-up the possibility of elimination of DO stage, alternate to the 1<sup>st</sup> stage of the conventional bleaching sequence, DEpD.

### Fibre Modification of Enzymes (CPPRI/TCIRD/IPMA)

The objective of the project is development of enzyme refining technology for recycled pulps to improve the pulp quality, drainability and to reduce the refining energy. Studies on enzymatic refining of recycled pulp (OCC and NDLKC) were completed with two commercial cellulase enzymes.

### Studies on Ozone Treatment of Indigenous Raw Material Pulp for better Bleachability

Studies on an indigenous raw material pulp with the major focus on improvement in bleached pulp quality & quality of liquid discharges. Under the project activities unbleached pulp of Eucalyptus of Kappa no. 17, initial brightness 27.90% ISO and CED viscosity 594 cm<sup>3</sup>/gm was subjected to single stage oxygen

delignification (ODL). The findings of the project is as under:-

- ❖ After Oxygen treatment, pulp Kappa number reduced from 17 to 11.2 whereas, brightness increased from 27.9 to 36% ISO. There was marginal drop in viscosity from 594 to 581 cm<sup>3</sup>/gm.
- ❖ When oxygen treated pulp was further bleached by AZ (EOP) sequence, Pulp brightness increased from 36% ISO to 80% ISO whereas viscosity reduced from 581 cm<sup>3</sup>/gm to 350 cm<sup>3</sup>/gm.
- ❖ Final bleached pulp strength properties indicated burst index 3.44 KPam<sup>2</sup>/gm and tensile index 57.11 Nm/gm. Further studies are in progress on other alternate short sequences.

### Continuing Education Training Programme for Technical Personnel in Pulp and Paper Industry (CPPRI)

11<sup>th</sup> Cess training programme was organized on “Trends in Processing and Papermaking of Recycled Fiber” from February 20 - 21, 2013 at Kashipur, Udham Singh Nagar, Uttarakhand. The programme received an overwhelming response from various paper mills located in Uttarakhand. Fifty technical personnel from different paper mills including II<sup>nd</sup> year students of M.Sc. (Cellulose and Paper Technology) participated in this training programme.



Participants of 11th Cess training programme with Mr. Pawan Aggarwal, Chief Guest, Senior Scientists of the CPPRI, External Faculty & M.Sc. Students (CPT) during Inaugural Session on February 21, 2013.



## Sponsored Projects

### **Deinking Optimization Studies of Currency Broke -** *Sponsored by M/s Security Paper Mills, Hoshangabad, M. P.*

The laboratory studies on deinking of currency broke were completed and the report is being prepared. The study has revealed that conventional processing of currency broke is energy intensive with low fiber yields. Based on CPPRI's work a new processing concept has been developed to achieve high fiber yield with low energy consumption.

### **Enzymatic Refining of Cotton Comber and Linter Pulps –** *Sponsored by M/s Security Paper Mill, Hoshangabad, M. P.*

The objective of the project is to explore enzymatic refining process for cotton comber to improve the pulp quality, drainability and to reduce energy during refining.

Enzyme treatment of cotton comber followed by cooking showed 20% savings in cooking chemicals (both NaOH and H<sub>2</sub>O<sub>2</sub> each) with additional savings of 10% refining energy. Characterisation of pulp and effluents is under progress.

### **Implementation of Charter for Water Recycling and Pollution Prevention in Pulp and Paper Industries in Ganga River Basin**

CPPRI is actively involved as monitoring agency to monitor the progress of implementation of **Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries in Ganga River Basin** by pulp and paper mills in the Kashipur, Muzaffarnagar, Meerut, Moradabad and Roorkee Cluster. During the period 80 mills were visited under the Charter for verification of the progress made by individual mills in context of Process Up-gradation, ETP Up-gradation, Water Conservation etc.

### **Improved Energy Efficiency through Utilization of Lignin Based Biomass from Agro Based Paper Mills -** *Sponsored by PCRA, New Delhi*

Pilot scale trials on utilization of lignosulphonate were carried out successfully in plywood and concrete industry. Based on the encouraging results obtained commercial scale trials are being planned.

### **Indexing, Digital Abstracting and Digitisation of IPPTA Articles/ Publications –** *Sponsored by IPPTA, Saharanpur*

This project has been awarded by IPPTA to CPPRI. The progress of the said project is as under :-

- ❖ e- Library portal has been designed and developed for IPPTA. Database of 20 years of Research articles/ publications of IPPTA (since 1992 - 2012) have been created and remaining database of research articles / publications of IPPTA Journals (1964 to 1992) are under progress to upload in the data base.

### **Pre-feasibility Studies on AKD Sizing of Cotton Pulp -** *Sponsored by M/s Security Paper Mills, Hoshangabad, M. P.*

Pre-feasibility studies on AKD sizing of cotton furnish were completed. Based on findings, the mill has initiated tendering process for procurement of AKD emulsion to undertake the plant trials on alkaline sizing.

### **Production of High Alpha Cellulose Pulps –** *Sponsored by M/s Godavari Biorefineries Ltd., Mumbai*

The project aim is to develop high alpha cellulose and high brightness pulps (90%) with low silica content.

### **Review and Validation the Baseline Energy Audit (BEA) Reports for all Designated Consumers Belonging to Pulp and Paper Sector, - Rendering Services as an Energy Professional under PAT Scheme** *- Sponsored by EESL, New Delhi*

This project has been awarded to CPPRI by Energy Efficiency Services Limited (EESL), Ministry of Power, Government of India. The progress of the said project is as under :-

- ❖ Consolidated sector specific reports were

prepared enlisting observations over the shortcomings with in each BEA report pertaining to Pulp and Paper Sector.

**Technological Improvement of a Process of Biological Reduction of AOX, Colour, COD and BOD of Waste Water Emanated from Large Pulp & Paper Industries. (CPPRI/IGIB, Star Paper Mills Ltd.,) - Sponsored by Department of Biotechnology, New Delhi**

Bio-augmentation studies of pulp and paper mill effluent using developed microbial process are continued at M/s Star paper mill to assess the viability of the developed process on field scale for long period. The uniqueness of the developed process is better reduction in major pollutant levels at low levels of MLSS and SVI levels when compared to the existing process.



Pilot plant commissioned at M/s Star Paper mill, Saharanpur for the microbial effluent treatment process developed by CPPRI & IGIB

**Mill Sponsored Projects**

Following sponsored projects were taken up at the instance of various Pulps, Paper and Allied Industries for the period January- March, 2013 by the Institute. Details are as under-:

S.No.	Consultancy Services / Technical Assistance	Sponsoring Agency
1.	Feasibility of Jute (Core) for pulp and paper production.	Jute Corporation of India, Kolkata, (West Bengal)
2.	Identify reasons for low productivity & suggest measures for improved productivity.	Cachar Paper Mill (HPC Ltd.) Distt. Hailakandi (Assam)
3.	Identify reasons for low productivity & suggest measures for improved productivity.	Nagaon Paper Mill (HPC Ltd.), Jagi Road (Assam)
4.	Technical Assistance in the area of chemical recovery operation.	Century Pulp & Paper, Lalkuan, Kashipur (U.K.)

**TECHNICAL/CONSULTANCY SERVICES**

Following consultancy/technical services were provided to various Pulp, Paper and Allied Industries for the period January - March, 2013 by the Institute. Details are as under-:

1. Technical services were rendered to the 40 Pulp and Paper mills and organizations by analyzing their effluents / solid waste samples and carrying out air monitoring studies for various pollution parameters.
2. 698 Pulp and Paper samples were evaluated for different paper properties like Brightness, Opacity, Tensile Index, Tear Index, Folding Endurance, Burst Index, Fiber Characteristics and Furnish Analysis.
3. 24 samples of non-fibrous raw material were analyzed for Moisture Content, Proximate Chemical Analysis.
4. 2 samples of non-fibrous raw material were analyzed for white liquor analysis.
5. 3 samples were analyzed for MCC pulp.



6. Evaluation of stickies control agent carried out for M/s Thermax Ltd., Pune.
7. Stickies profiling at DIP-3 and P/M-3 carried out for M/s Emami Paper Mill Ltd., Balasore (Orissa).
8. Analysis of Deinking chemical (IG SURF 11195 A) carried out for M/s India Glycols Ltd., Noida (U.P).
9. Evaluation of market RCF pulp carried out for M/s VLS Fibre, Chennai.
10. Analysis of maize starch powder (3 B001413) for degree of substitution carried out for M/s Riddhi Siddhi GlucoBiols Ltd., Pantnagar (U.K).
11. Evaluation of modified IBF Gum based product for improvement in burst factor carried out for M/s Serix Specialities, Surat (Gujarat).
12. Chemical analysis of biomass samples received from catalysis & Inorganic Chemistry division, National Chemical Laboratory, Pune.

## WORKSHOP/SEMINAR/MEETINGS

CPPRI Scientists participated in the following workshop/seminar:-

- ❖ “India – Japan Workshop for Promotion of Energy Efficiency and Conservation / Capacity Building under PAT <PCRA> (BPIN- 8)”.



Sh. Alok Kumar Goel, Scientist 'C' and Shri N.K. Naik, TO 'B' attended the workshop at Tokiyo, Japan.

- ❖ “Energy Saving Targets & Monitoring & Verification (M&V) Issues under PAT Scheme” at India Habitat Centre, New Delhi organized by DESL.
- ❖ “Designated Consumers (Dc's) Notified under PAT Scheme” at Ahmedabad.

CPPRI Scientists visited different organisations to participated in the following meetings:-

- ❖ Annual General Meeting (AGM) of Indian Paper Manufacturers Association (IPMA) held at Hotel Le Meridien, New Delhi to discuss the issues related to Recycled fibre processing in newsprint mills.
- ❖ Bureau of Energy Efficiency (BEE) and Energy Efficiency Services Limited (EESL), Ministry of Power, New Delhi to attend a meeting organized for reviewing of energy audit reports (BEA) of pulp and paper mills under PAT Scheme, to suggest the methodology for consideration of normalization factors in the energy consumption of pulp and paper sector, on the Amendment of Form - I.
- ❖ Energy Efficiency Services Limited (EESL), New Delhi to attend meetings for reviewing of various base line energy audit reports conducted by various auditing agencies under PAT Scheme.
- ❖ M/s Godavari biorefineries Ltd., Mumbai to review the progress of the ongoing project sponsored by GBL.
- ❖ M/s Rossari Biotech Ltd., Mumbai as a expert member nominated by TIFAC, Department of Science & Technology, Govt. of India.
- ❖ IGNOU and discussed the matter on Art Paper Specification.
- ❖ Joint Secretary, DIPP and MoEF, DIG (Forest) and discussed the matter on degraded forest in XII<sup>th</sup> Plan.
- ❖ Packaging Group and Alert Panel in BIS, Mumbai.

- ❖ BRBNMPL, technical committee meeting at Bangalore.
- ❖ Khadi & Village Industries Commission (KVIC), Regional Office, Ambala to participate in the meeting and to submit the report on sponsored project.
- ❖ Project Review Committee Meeting for final review of the outcome of the Project Environmental Pollution Control in Agro based Paper Industry by implementation of Lignin Precipitation System (LPS) Technology at Kuantum Papers Ltd., Punjab at Kuantum Papers Ltd., Sailakhurd Punjab.



Members of PRC viz Shri M. Salahuddin, MoEF Shri A.K. Vidyarthi & Dr. S. Panwar, inspecting the Lignin Precipitation System installed by Kuantum Papers under the Project

## LECTURES AND PRESENTATIONS

- ❖ Under 11<sup>th</sup> Cess Training programme around 9 lectures were delivered on different topic broadly covering the issues of RCF based mills.
- ❖ Dr. R. K. Jain Sc. 'F' delivered lecture on “Biorefining: Enzymes for Refining: Process Parameters for Enzyme Refining, Advantages, Limitations and Economic Aspects” to M.Sc. (Cellulose & Paper Technology) students on March 06, 2013 at Forest Research Institute (Deemed) University, Dehradun.
- ❖ Dr. Nitin Endlay, Sc. 'E-I' made a presentation on “Odorous Emissions in Indian Pulp & Paper Industry - Factors Influencing their Generation & Available Control Technologies”, at National Workshop on Sensory Systems for Environmental Monitoring of Obnoxious Odors and VOCs in Industries, February 7 - 8, 2013, National Institute for Environment Engineering & Research (NEERI), Nagpur.



Dr. Nitin Endlay Sc. 'E-I' giving presentation at NEERI, Nagpur Workshop

- ❖ Sh. Alok Kumar Goel, Sc. 'C' and Shri N.K. Naik, TO 'B' made a presentation on “Status of Energy Consumption and Technological Tools / Help for Achievement of Higher Efficiency” in workshop on “India – Japan Workshop for promotion of Energy Efficiency and Conservation / Capacity Building under PAT <PCRA> (BPIN-8)”.
- ❖ Dr. Sanjay Tyagi, Sc. 'C' delivered lectures as a guest faculty on “Material Handling & Safety” (Mechanical Engineering) to the students of B. Tech (IIIrd and IVth Year) at Department of Paper Technology, IIT Roorkee for Autumn Semester 2013.

## REPORTS AND PUBLICATIONS

### Reports

- ❖ Audit Assessment of Hazardous Waste (2011- 12) at Century Pulp & Paper Ltd., Lalkuan, Uttarakhand.
- ❖ Interim Progress Report of Implementation of CPCB Charter on Water Recycling & Pollution Prevention in Pulp & Paper Industries of Ganga River Basin.
- ❖ CPCB Charter Compliance Progress Report of 75 mills.
- ❖ ETP Adequacy Report of Magnum Ventures Ltd., Ghaziabad, U.P.
- ❖ Water Audit of Magnum Ventures Ltd., Ghaziabad, U.P.

### Publications

#### National

- ❖ Endlay, Nitin; Mishra, Shivaker; Mohd. Farid; Mohd. Salim; Gupta, M. K.; Panwar, S. and Mathur R. M. "Odorous Emissions in Indian Pulp & Paper Industry – Factors Influencing their Generation & Available Control Technologies", Proceedings of National Workshop on Sensory Systems for Environmental Monitoring of Obnoxious Odors and VOCs in Industries, February 7 - 8, 2013, National Institute for Environment Engineering & Research (NEERI), Nagpur.
- ❖ Dasgupta, Diptarka; Suman, Sunil Kumar; Pandey, Diwakar; Ghosh, Debashish; Khan, Rashmi; Agrawal, Deepti; Jain, Rakesh Kumar; Thakur, Vasanta Vadde and Adhikari, Dilip K. "Design and Optimization of Ethanol Production from Bagasse Pith Hydrolysate by a Thermotolerant Yeast *Kluyveromyces* sp. IIPE453 using Response Surface Methodology". Springer Plus 2013 2:159.

## INTERACTION WITH INDUSTRY

- ❖ M/s Godawari Biorefineries Ltd., for production of high alpha cellulose pulps.
- ❖ M/s Star Paper Mills Ltd., SRE in connection with the pilot trial on developed biological effluent treatment process under DBT sponsored project.
- ❖ M/s Century Pulp & Paper, Lalkuan for studies on chemical recovery.

### Visits to Mills and Other Organisations

CPPRI Scientists visited following mills & other organisations:-

- ❖ Institute of Genomics & Integrative Biology (IGIB), New Delhi for discussions in connection with the Cess & DBT sponsored projects.
- ❖ M/s Century Pulp & Paper Mills Ltd., Lalkuan for discussion in connection with the soda loss in chemical recovery & process audit of the chemical recovery section.
- ❖ M/s Garg Duplex Limited, Muzaffarnagar for discussion under the sponsored project on Common Chemical Recovery for Agro based paper mills cluster located in Muzaffarnagar.
- ❖ M/s Shankar Gramodyog, Hapur for preparation of handmade paper sheets from Hosiery pulp.
- ❖ Handmade paper cluster, Kurukshetra for collection of samples and data in respect of units scattered in the cluster under the KVIC sponsored project.
- ❖ M/s Sandeep Papers Ltd., Noida to verify adequacy of existing ETP.
- ❖ 80 pulp & paper mills in Kashipur, Muzaffarnagar, Moradabad & Roorkee cluster were visited on regular basis to monitor/verify the progress of implementation of Charter, collection & analysis of waste water samples and evaluation of performance of their ETPs under the activity



"Implementation of CPCB Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries of Ganga River Basin".

- ❖ Ashok Paper Mill, (Bihar Unit) Darbhanga for Rehabilitation and to prepare a list of the inventory items in the mill including scrap and redundant material.
- ❖ M/s Century Pulp and Paper Ltd., Lalkuan for Hazardous Waste Audit and Environmental Monitoring.
- ❖ DIPP, New Delhi to submit the report of Ashok Paper Mill, Darbhanga.
- ❖ M.Sc. Cellulose and Paper Technology (Final Year) Students visited the following mills.
  1. M/s Naini Tissues Ltd., Kashipur
  2. M/s Bindal Papers Ltd., Muzaffarnagar
  3. M/s Bindlas Duplux Ltd., Muzaffarnagar
  4. M/s Siddeshwari Industries (P) Ltd., Meerut
  5. M/s Star Paper Mill Ltd., Saharanpur



M.Sc (Cellulose & Paper Technology) Students with CPPRI Faculty (Dr. S. Mishra & Dr. N. Endley & Star Paper Mills Ltd., Officials.

## VISITORS

### International

- ❖ Visit of Mr. Hans Christiansson, Consultant, INNventia, Stockholm, Sweden in connection with installation of "Optitopo" Equipment in January 2013.



Mr. Hans Christiansson, Dr. B. P. Thapliyal, Dr. R. D. Godiyal and Dr. Sanjay Tyagi during the Surface Topography Analyser "OPTITOPO" installation in Paper Testing Laboratory

- ❖ Visit of Dr. Stephan Kleemann, Head of the Master Program Paper Technology, Munich University of Applied Sciences, Munich Germany, in March 2013.

### National

- ❖ Shri. R. S. Tomar, Technical Executive, Security Paper Mills Limited visited Biotechnology Division of CPPRI to provide raw material and pulp samples for the project activities of SPM sponsored project on January 04, 2013.
- ❖ Mr. R. K. Nair and Mr. Suresh Kumar from Metso India Limited visited CPPRI for discussions in the area of chemical recovery on January 17, 2013.



Dr. A.K.Dixit, Dr. R.K. Jain, Dr. R.M. Mathur and Mr. R. K. Nair and Mr. Suresh Kumar from Metso India Limited during signing of MoU between CPPRI and Metso India.

- ❖ Dr. D. K. Adhikari, Dr. D. Ghosh, Dr. Deepti & Ms. Neelima from Indian Institute of Petroleum (IIP), Dehradun visited CPPRI for discussions in connection with the CPPRI-IIP joint project entitled “An Integrated Approach for Utilisation of Bagasse Pith for Bioethanol Production and Value Added Lignin Products” sponsored by Cess Committee on January 28, 2013.

## CPPRI INSTITUTE MEMBERSHIP

CPPRI welcome the new members, Shri Sanjiv Kumar Agarwal, Kolkata becoming the part of our Individual membership brigade.

## STAFF NEWS

### Appointment

**Name:** Mr. Kumar Anupam  
**Designation:** Senior Scientific Assistant (SSA)  
**Date of Joining:** 24/01/2013

### Congratulation's

### Retirement

**Name:** Shri S.C. Dey  
**Designation:** P.S. to Director  
**Date of Retirement:** 31/01/2013

## गणतन्त्र दिवस – 2013

गणतंत्र दिवस की 63वीं वर्षगांठ की पावन बेला पर संस्थान के प्रांगण में निदेशक महोदय डा. आर. एम. माथुर द्वारा ध्वजारोहण किया गया। इस अवसर पर निदेशक महोदय ने संबोधित करते हुए कहा कि आज से 6 दशकपूर्व 26 जनवरी 1950 को हमारा देश एक स्वतंत्र गणराज्य बना था। आज के दिन से हमें अपने विकास के लिए अपने अनुरूप योजनाएं बनाने का सौभाग्य प्राप्त हुआ था और आज के दिन से हमें उन योजनाओं को पूरा करने के लिए राजस्व जुटाने की आजादी मिली थी।

तब से आज तक देश के चहुँमुखी विकास के लिए विभिन्न योजनाएं बनती रही हैं और उन पर निरन्तर कार्य होता रहा है जिसके कारण आज देश हर दिशा में तरक्की कर रहा है। निदेशक महोदय ने अपना संदेश में कहा कि संस्थान पांच वर्षों में कच्चे माल, ऊर्जा व जलसंवर्धन, मानव संसाधन विकास, गुणवत्ता विकास के क्षेत्रों में महत्वपूर्ण अनुसंधान व विकास का कार्य करेगा। संस्थान ने वित्त वर्ष 2011-2012 तक रु. 2.52 करोड़ का आंतरिक राजस्व अर्जित किया है जिसे भविष्य में और अधिक बढ़ाने के सभी संभव प्रयास किये जायेंगे। राष्ट्र भाषा हिन्दी को कार्यालय के दैनिक कार्यों में उपयोग हेतु बढ़ावा दिया जा रहा है,

अन्त में गणतंत्र दिवस के पावन अवसर पर महोदय ने महान शहीदों को नमन करते हुए संस्थान के सभी अधिकारियों एवं कर्मचारियों और उनके परिवार के लिये ईश्वर से मंगलकामना की प्रार्थना करता हूँ।



## ABSTRACTS

### Deinking

Ammala, Ari; Makinen, Liisa; Liimatainen, Henrikki and Niinimaki, Jouko. **Effect of Carboxymethylcellulose and Starch Depressants on Recovery of Filler and Fines in Tertiary Flotation.** *Tappi journal vol. 12 (3), 2013. Pg. 43-50.*

**Abstract:** Yield loss in state-of-art deinking processes for newsprint is usually 15%–20%. Economic and environmental concerns associated with reject handling point to a need to improve yield. This paper describes a study conducted to determine whether it is possible to recover fillers and fiber fines from flotation froth reject of an old newsprint/old magazine processing mill by refloating froth with and without the use of depressants. The recovery of approximately 10%–15% of material was observed without the use of additional flotation chemicals in the refloating stage. Carboxymethylcellulose (CMC) was observed to be a functional depressant that enhanced fiber fines recovery in particular and, to some extent, china clay recovery but lowered calcium carbonate recovery. The recovery increased to 20%–30% with a dosage of approximately 1 kg CMC/ton of pulp. In addition, starch had a depressing effect, but this effect was weaker than that of CMC, even with much higher dosages.

### Biorefinery

Patil, Ravikant; Genco, Joseph M.; Pendse, Hemand and Heiningen, Adriaan Van. **Cleavage of Acetyl Groups from Northeast Hardwood for Acetic Acid Production in Kraft Pulp Mills.** *Tappi journal vol. 12 (2), 2013. Pg. 57-67.*

**Abstract:** This study identified the optimum conditions for cleavage of acetyl groups from wood hemicelluloses for possible conversion to salts of acetate or to acetic acid in kraft pulp mills. Acetyl groups in wood hemicelluloses can be hydrolyzed by

either OH<sup>-</sup> (hydroxide) or H<sup>+</sup> (hydronium) ions. Experimental data are presented for the extraction of industrial northeast hardwood chips using alkali streams that are available in the kraft pulp mills: caustic, green liquor, and white liquor. The effects of extraction time, chip soaking temperature, alkali concentration, and extraction temperature on cleavage of acetyl groups were investigated.

Soaking at elevated temperature was found to be more effective than no soaking or soaking at room temperature. The rate of cleavage of acetyl groups from wood hemicelluloses was proportional to the initial hydroxide ion concentration in the liquor. Both white liquor and 0.5 N sodium hydroxide had higher rates of hydrolysis of acetyl groups compared to green liquor, which contained fewer hydroxide ions. The initial hydroxide ion concentration in the liquor also determined the mechanism by which acetyl groups were hydrolyzed from the hemicellulose backbone. If the extraction liquor contained excess hydroxide ions, then most acetyl groups were directly hydrolyzed from the xylan polymer to form sodium acetate, and the xylan remained in the wood, provided the temperature was low. The extraction temperature had a negligible effect on rate of cleavage of acetyl groups if the liquor contained excess hydroxide ions.



**We welcome suggestions & comments  
for further improvement of this News Bulletin.**

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