

News Bulletin on Pulp, Paper and Allied Industries

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Jan- March 2016

RESEARCH AND DEVELOPMENT ACTIVITIES

RAC Projects

Raw Material and Product Development

Utilization of Rice Straw and other Non Conventional Raw Materials for Production of Various Grades of Pulp

Subsequent to the chemical proximate analysis of coil fibers, Kraft pulping studies were carried out to optimize the cooking chemical (Na_2O) while maintaining a sulphidity of 20. The objective was to obtain unbleached pulp for chemical grade pulp. After evaluation of unbleached pulp for parameters i.e. freeness, viscosity, kappa number etc. The pulp subjected 10 chorine free bleaching. In order to preserve the pulp viscosity it was concluded to maintain a little higher kappa number. Under optimized conditions, unbleached pulp kappa number of ~28 and pulp viscosity of 533cc/g was achieved with 18% cooking chemical as Na_2O . After bleaching pulp viscosity of 398 cc/g was obtained. Black liquor obtained during Kraft pulping was also characterized.

New Approaches in Processing & Paper Making of Recycled Fibre to Improve the Quality of End Product

(i) Mineral Deinking- A New Approach to Improve Quality of Newsprint

In continuation to earlier work done in mineral deinking different furnish of Old Newsprint Paper (ONP), Old Magazine Grade (OMG) and Mixed Office Waste (MOW) were evaluated for deinking performance under optimum conditions. A maximum improvement of 15% ISO brightness has been achieved with a added advantage of ash in paper to the tune of 5%. More studies are in progress with new formulations and new additives.

Energy Conservation and Environmental Management

Implementation of Enzyme Application in Pulp & Paper Industry

Preliminary studies on laccase producing fungal isolate showed positive results in screening of selected isolate. After screening, optimization of laccase producing fungal isolate is under progress with the objective of producing indigenous lacasse enzyme with high titre for enzymatic bleaching of unbleached pulp. Optimizations of physiological parameters on reduction of effluent COD and colour through 5 bacterial isolates were continued with studies on effect of pH and temperature. Results indicate highest reduction efficiency at pH 7 and 37⁰C. Higher reduction efficiency obtained at 37⁰C compared to 43⁰C also indicated that isolated bacterial strain are mesophilic.

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

Studies on desilication and liquor heat treatment of black liquor to improve the rheological and combustion behaviour of black liquor were conducted. Desilication and liquor heat treatment of agro based black liquor was performed at lab scale as well as pilot plant scale. Agro black liquor for the study was collected from M/s Trident Ltd., Barnala. Lignin removal studies were carried out with an agro black liquor to reduce load on chemical recovery systems so that more pulp could be produced. Studies are continued.

Water Conservation through Application of Kidney Technology in Indian Pulp and Paper Industry

Performance evaluation & ETP adequacy assessment of large integrated pulp & paper mill was carried out. A detailed report with recommendations and suggestions for improving the performance of ETP was submitted to the mill.

Water audit of two waste paper based paper mills were carried out under project activities.

Design specification for procurement of a bench top hollow membrane filtration unit to carry out studies on color removal in pulp and paper mill effluent were finalized and order was placed for fabrication of the equipment.



Water audit being carried out by CPPRI Scientist

Infrastructure Development and Capacity Building Activities

Setting up of Paper Board and Speciality Paper Testing Facilities at CPPRI

One of the primary function of any shipping container is to resist stacking loads during ware housing and / or shipping. This stackability of corrugated boxes is best determined by Box Compression Test (BCT). It gives us an idea about the stacking strength of corrugated box. This is a very vital property of corrugated boxes. CPPRI invited quotations for the purchase of Box Compression tester. Quotations received from different suppliers were evaluated for technical specifications and comparative chart was prepared.

Cess Projects

Increase in brightness ceiling of agro residue pulps in cost effective manner specifically for wheat straw

The results of brightness determined at ACIRD to find out reasons behind low brightness development in agro residue bleached pulp were validated by CPPRI by running the experiments under similar condition. A report with recommendation was submitted.

Improvement in selectivity of oxygen bleaching

Based on ACIRD results obtained with selected additive/chemical for the improvement in selectivity of oxygen bleaching. CPPRI validated the ACIRD results by using various protectors and additives in order to preserve strength and yield during ODL treatment and submitted the report with recommendation.

Development of Protocol for Deposit Control in RCF Based Mills for Better Machine Runnability

Total Organic Carbon (TOC) Analyser was purchased & installed successfully and studies have been initiated to develop / establish a methodology for measurement of Dissolved Colloidal Material (DCM) to control deposition on paper machine and to study the effect of variation of different parameters such as water hardness, furnish blends, paper making chemistry, white water clarity etc. on paper machine deposition.

Pilot Scale Studies on Efficient Depithing of Bagasse: a process developed by CPPRI (sponsored by M/s Tamilnadu Newsprint & Papers Ltd., Tamilnadu.)

The objective of the project is to develop and design depithing equipment for efficient depithing of bagasse based on technology developed by CPPRI in order to help the paper industry to get high fibre content and to improve the quality of paper produced from bagasse. Depithing studies on Bagasse, collected from a sugar mill, were conducted. Demonstration of existing pilot plant was given to officials from TNPL. Bagasse, before and after depithing, was characterized for pith content. Pith content was reduced to less than 7%w/w from 35% w/w after depithing.

Sponsored Projects

Lab Scale Flootation Deinking of OCC & NCC furnish- Sponsored by Arab Paper Manufacturing Company, Dammam, Kingdom of Saudi Arabia

The objective of the project was to study the efficacy of floatation deinking technology for removal of sticky contaminants from OCC & NCC waste paper furnish provided by the Arab Paper Manufacturing Company, Saudi Arabia. The study revealed that Flootation Deinking technology can be applied effectively to remove stickies contamination. A reduction efficiency to the tune of 58% achieved for macrostickies ($\geq 100\mu\text{m}$) concentration and a reduction efficiency of 98% was achieved for microstickies ($< 100\mu\text{m}$) concentration.

Trial plan for “Oxygen Pretreatment followed by CEopHEpD and DEopHEpD Bleaching of Hardwood Pulp” Sponsored by M/s. Grasim Industries Ltd Unit: - Harihar polyfibers Kumarapatnam

The unbleached pulp around kappa number 8-10 was received from M/s. Grasim Industries Ltd Unit: - Harihar polyfibers Kumarapatnam. The optimization of oxygen pre-treatment of unbleached pulp was carried out for different parameters such as time, temperature and alkali. After achieving the desired kappa number and viscosity oxygen delignified pulp was bleached with CEopHEpD and DEopHEpD sequence to get the bleaching of pulp 86-88%ISO brightness. Also other parameters like Alpha cellulose, Viscosity, Ash Content, and Pentosan Content were analyzed for unbleached pulp.

Evaluation of Additive Pulping of Mix Hard Wood Sample Sponsored by M/s. Paras Bio Sciences Pvt. Ltd. J.P. nagar Bangalore India

Mix hardwood chips (vener chips and Eucalyptus) were received from Star Paper Mills Ltd. Saharanpur for pulping optimization. After achieving the desired kappa no. two different additives were used in pulping process. The results of control and additives added were compared.

Additive Pulping of Hardwood Sample Sponsored by M/s Novecare India Technical Specialty-IF Business Thane (W).

Mix hardwood (vener chips and Eucalyptus) chips were received from star paper mills ltd. Saharanpur for pulping optimization. After achieving the desired kappa no. three different additives namely Rhodapex CKA, Rhodapon Bos, and 2810 were used in different ratio in pulping process. The results of control and additives were compared.

ECF Bleaching of Hardwood Pulp M/s. Bits Pilani- Hydrabaad Campus, Telangana, India.

Unscreened unbleached pulp received from BITS Pilani, Hydrabad Campus for bleaching experiments following the sequence ODEopDEpD. Further other parameters like Alpha cellulose, Viscosity, Ash Content, and Pentosan Content were analyzed.

Laboratory and Pilot Plant Extraction of Pulping Trials of Hardwood Sponsored by M/s. ITC Life sciences, Bangalore.

Debark and Bark samples of hardwood chips were received from ITC, Bangalore, for Pre-extraction of chips with green liquor. After extraction liquor was collected and chips were further treated with white liquor. The unbleached pulp was characterised and black liquor properties were also analyzed.

Desilication and Liquor Heat Treatment Studies (Sponsored by M/s Trident, Barnala, Punjab.)

Lab scale studies on liquor heat treatment of wheat straw black liquor, received from M/s Trident Limited was conducted, which have shown encouraging results. Desilication of black liquor reduced the silica content nearly 90% with residual silica content around 0.25% w/w.

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

CPPRI as third party continued to play an active role through quarterly progress verification in context of Charter implementation , ETP adequacy assessment , Action Plan verification etc of various Paper mills of Uttar Pradesh & Uttarakhand.

Development and Adoption of Appropriate Technologies for Enhancing Productivity in Pulp & Paper Sector (UNIDO project)

Under this recently initiated project , detailed questionnaire for generation of data base related to technological and environmental status of pulp and paper mills in the selected clusters viz , Kashipur , Vapi , Coimbatore & Punjab were prepared, CPPRI scientists were deputed to collect the data and information from mills and mill associations in the selected cluster.

Further four stake holders consultation meetings were organized at Kashipur , Chandigarh, Vapi and Coimbatore to sensitize the mills in the selected clusters mill associations and other stake holders about the objectives and deliverables of the UNIDO project as well as seek inputs on the challenges and technology gaps faced by the sector and suggest the way forward to address such challenges or gaps . The purpose of the meeting was also to identify suitable paper and pulp units for detailed diagnostic under the project . The meeting attracted active participation from pulp and paper mills, government agencies, R& D institutions academia and other stake holders .

International UNIDO experts Mr Jani Mannikko, University of Helsinki & Mr Ovvind Erickson, Paper & Fiber Research Institute, Norway visited CPPRI to get acquainted with facilities and expertise available at CPPRI as well as identify the areas and scope for further capacity development and improvement in capability / expertise.



UNIDO Workshop at Kashipur



UNIDO Workshop at Chandigarh



UNIDO Workshop at Coimbatore

TECHNICAL/CONSULTANCY SERVICES

Following technical/ consultancy services were provided to various pulp, paper and allied industries for the period of January – March 2016 by the institute. Details are as under:-

- 909 Nos. of sample were evaluated for different paper properties like Brightness, Opacity, Tensile, Tear, Fold Endurance, Burst Index, Fiber Characteristics, Furnish Analysis and Cobb analysis.

- 24 Nos. sample of raw material, lime, sulphates, biomass, black liquor, lignosulphonate, ESP Ash, white liquor, green liquor, soda ash and lignin were analysed for various Physico-Chemical, thermal and elemental properties.
- Elemental analysis of 07 samples of Black liquor for carbon, hydrogen, nitrogen and sulphur.
- 2 Nos. sample of unbleached pulp for estimation of Kappa Number.
- 5 Nos. sample of bleached pulp pad received from IC & PP Division under the paid project of Century Rayon, Maharashtra for the analysis of Pentosans content.
- 2 Nos. samples of Dissolving grade and card Board (White) were received under the paid project of Intertek India Pvt. Ltd. For the analysis of Alpha cellulose (Ash corrected) , Alcohol Benzene Solubility, Pentosans Content (Ash corrected),
- Analysis of fibre quality of Market/ Wood pulp were carried out for Tradecom International Ltd; New Delhi, DFE Pharma; Tamil Nadu and Century Rayon; Thane.
- Evaluation of Softwood/ Hardwood for Moisture, Brightness & Strength properties carried out for Avantha Centre for Industrial Research & Development (ACIRD); Yamuna Nagar and Kuantum Papers Ltd; Punjab
- Analysis of Paperboard for Sulphur and OBA content was carried out for Khanna Paper Mill; Gurgaon
- Repulpability of Waste paper was carried out for Srilaxmi Exports; Chennai
- Evaluation of Pulp sample for Pitch content in pulp carried out for Century Pulp & Paper; Lalkua, Haldwani
- Evaluation of Oxidized starch was carried out for Bindals Papers Mills Limited; Muzaffarnagar and Gayatrishakti Paper & Boards Ltd Unit – II, Mumbai

Technical services rendered to following mills

- JK Paper Ltd. Unit : Rayagada, Odisha
- Centre for Environmental Studies Anna University Chennai, Tamil Nadu
- Sangal Paper Ltd., Mawana, Uttar Pradesh
- Star Paper Mill Ltd., Saharanpur, Uttar Pradesh
- Century Pulp and Paper Ltd., Lalkua , Uttarakhand
- ITC Limited Paperboards & Specialty Papers Division Unit- Bhadrachalam Khammam Andhra Pradesh.
- Grasim Industries Ltd., Unit : Harihar Polyfibers, Karnataka ,
- Vishwanath Paper & Boards Ltd., Jaspur, Uttarakhand
- Devrishi Papers Pvt. Ltd., Jaspur, Uttar Pradesh
- Suyash Kraft and Paper Ltd., Muzaffarnagar, Uttar Pradesh
- Mohit Paper Mills Ltd., Bijnor, Uttar Pradesh
- Ved Cellulose Ltd., Hapur, Uttar Pradesh
- Dev Priya Industries Private Ltd., Meerut, Uttar Pradesh
- Shreyans Industries Ltd., Sangrur, Punjab
- Naini Tissues Ltd., Kashipur, Uttarakhand
- Naini Paper Ltd., Kashipur, Uttarakhand
- Vishvakarma Paper and Boards Ltd., Kashipur, Uttarakhand

- Genus Paper & Boards Ltd., Moradabad, Uttar Pradesh
- International Paper India Pvt Ltd., New Delhi, Uttar Pradesh
- Grasim Industries Ltd., Haveri, Karnataka
- Deoria Paper Mill Ltd., Deoria, Uttar Pradesh
- Yash Papers Ltd., Faizabad , Uttar Pradesh
- Mahalaxmi Craft & Tissues Pvt. Ltd., Muzaffarnagar, Uttar Pradesh
- Tirupati Balaji Fibers Ltd., Muzaffarnagar, Uttar Pradesh
- Shakumbhari Pulp & Paper Mills Ltd., Muzaffarnagar, Uttar Pradesh
- Silverton Pulp & Paper Private Ltd., Muzaffarnagar, Uttar Pradesh
- Parijat Paper Mills Limited., Muzaffarnagar, Uttar Pradesh
- Multiwal Pulp and Board Mills Pvt Ltd., Kashipur, Uttarakhand
- Chamunda Papers Pvt. Ltd., Hapur, Uttar Pradesh
- Galaxy Papers Pvt. Ltd., Muzaffarnagar, Uttar Pradesh
- New Bonanza India Ltd., Meerut, Uttar Pradesh
- Cheema Papers Ltd., Kashipur, Uttarakhand
- PSB Papers Ltd., Kashipur, Uttarakhand
- Tehri Pulp and Paper Ltd., Muzaffarnagar, Uttar Pradesh
- Sandeep Paper Mills Pvt. Ltd., Noida , U.P.
- Kawatra Papers Pvt. Ltd., Dadri, Uttar Pradesh
- Hariom Industries Ltd., Kanpur, Uttar Pradesh
- Mahadev Pulp Products (P) Ltd., Kanpur, Uttar Pradesh
- Prime Pulp and Paper Pvt. Ltd., Muzaffarnagar, Uttar Pradesh
- Lalji Board India Pvt. Ltd., Firozabad, Uttar Pradesh
- Kamakshi Papers Pvt. Ltd., Gajraula, Uttar Pradesh
- Sangal Paper Ltd., Sandhan, Uttar Pradesh
- ITC Ltd., Paperboards & Specialty papers Division Unit- Bhadrachalam , Khammam Andhra Pradesh
- Magnum Ventures Ltd., Sahibabad , Uttar Pradesh
- Shree Sidhballi Paper Mills Ltd., Muzaffarnagar, Uttar Pradesh
- Shree Bhageshwari Paper Ltd., Muzaffarnagar, Uttar Pradesh
- Sainsons Paper Industries Ltd., Kurukh, Jharkhand
- Gangotri Paper Mills Pvt. Ltd., Haridwar ,Uttarakhand

WORKSHOP/SEMINAR/MEETING

WORKSHOP/SEMINAR

CPPRI Scientists visited different organizations to participate in the following workshop/ seminar –

- Dr S. Panwar attended IPPTA seminar on Resource Conservation as a Key to Competitiveness , March 10-11, 2016 , Kolkatta.

- Kumar Anupam, SSA attended National Workshop on “Contemporary Surfacing Trends in analytics: Applications in Engineering and Management” from Feb 12-13, 2016 at Department of Management Studies, National Institute of Technology, Hamirpur, H.P.
- Ms. Prachi Kaushik, SRF, Shri Manoj , JRF, Ms. Manju Bisht, JRF, Mrs. Nidhi Sharma, JRF attended two days 15th CESS Training Program on “Printing and Surface Properties Evaluation of Paper” on January 19-20, 2016.

Meetings

- Dr. B.P. Thapliyal visit BEE, New Delhi for review of M&V reports of paper sector on January 2-4, 2016 .
- Dr Nitin Endlay & Dr. Shivaker Mishra attended a meeting on Hindon rejuvenation at Saharanpur Municipal board Office on January 18, 2016.
- Dr. B.P. Thapliyal, Scientist E-II , to attend the meeting at BIS, New Delhi for discussion of upcoming CHD-15 meeting of Agenda Points on January 28, 2016.
- Mrs. Rita Tandon, Sc-F & Dr. B.P. Thapliyal, Scientist E-II, to attend the CHD-15 Meeting at BIS, New Delhi on February 9, 2016
- Dr. R.K.Jain, Mrs. Rita Tandon, Dr.S.Panwar, Dr. B.P.Thapliyal & Dr. Nitin Endlay attended 1st Stakeholders Consultative Meeting on UNIDO Project: Development and Adoption of Appropriate Technologies for Enhancing Productivity in the Paper and Pulp Sector held on February 18, 2016 at Kashipur.
- Dr. B.P. Thapliyal, Scientist E-II, attend the meeting at NCERT , New Delhi on February 20, 2016 .
- Mrs. Rita Tandon, Sc-F attended Governing Council meeting of CPPRI under the chairmanship of Shri. Shailandra Singh, I.A.S, Joint Secretary, DIPP at Udyog Bhawan, New Delhi held on February 23, 2016.
- Dr. R.K.Jain, Mrs. Rita Tandon, Dr.S.Panwar, Dr. B.P.Thapliyal & Dr. R.D.Godiyal, Dr. A.K. Dixit and Dr. S. Mishra, Dr. Priti S. Lal and Mrs. Anuradha V Janvade attended 2nd Stakeholders Consultative Meeting on UNIDO Project: Development and Adoption of Appropriate Technologies for Enhancing Productivity in the Paper and Pulp Sector on March 5, 2016, at Chandigarh.
- Dr. R.K.Jain, Mrs. Rita Tandon, Dr. B.P.Thapliyal & Dr. R.D.Godiyal, Dr. A.K. Dixit and Shri S.D.Negi attended 3rd Stakeholders Consultative Meeting on UNIDO Project: Development and Adoption of Appropriate Technologies for Enhancing Productivity in the Paper and Pulp Sector on March 12, 2016 at Vapi.

- Dr. M.K. Gupta attended a meeting organized by UPPPCB at Kanpur on March 12, 2016 to review the progress of charter implementation by pulp & paper mills of Eastern UP.
- Dr. R.K.Jain, Dr. B.P.Thapliyal, Dr. M.K.Gupta and Dr. A.K. Dixit attended 4th Stakeholders Consultative Meeting on UNIDO Project: Development and Adoption of Appropriate Technologies for Enhancing Productivity in the Paper and Pulp Sector on March 19, 2016 at Coimbatore.
- Dr S. Panwar attended meetings organized by UPPPCB at Meerut (March 17, 2016), Moradabad (March 23, 2016) & Muzaffarnagar (March 29, 2016) 12.3.2016 to review the progress of charter implementation by pulp & paper mills in respective clusters.
- Dr. Sanjay Tyagi, Scientist C visited following mills of Kashipur in connection of UNIDO project
 - Naini Tissues Limited
 - Siddarth Paper Mills Limited
 - Katyayini Paper Mills Limited
 - Banwari Paper Mills Limited
 - Prakash Straw Board (P) Limited, Baazpur
 - Garolla Papers and Board Limited
 - Sahota Paper Limited , Jaspur
 - Fibermarks Paper Mills Limited
 - Prolific Papers (P) Limited, Kashipur
 - Shri Shyam Pulp and Board Mills Limited
 - Vishwakarma Paper Board Limited
 - Vishwanath Paper and Board Limited

TRAINING

TRAINING CONDUCTED

- Dr. B.P. Thapliyal, Scientist E-II, Dr. R.D. Godiyal, Scientist E-I, Dr. Sanjay Tyagi, Scientist – C delivered lectures and arranged external faculty for two days 15th CESS Training Program on “Printing and Surface Properties Evaluation of Paper” on 19th and 20th January 2016. Eminent International speakers like Mr. Andre , M. M. Verhoenen, Area Manager, IGT Netherland and National Speakers like Mr. Kiram Prayagi, Consultant Graphic Art Technology and Education, Mumbai, Professor, Anjan Baral, GJU, Haryana, Krishna Kumar, Eloff Hansson, Chennai and Suresh Babu , Head, R & D Century Pulp and Paper Mills Limited , Lalkuan

and CPPRI Scientists on different aspect of printing technology. About 32 participants from paper Industry attended the above program.

- Ms. Ankita Chahal, M.Tech student from Banasthali Vidyapith, Jaipur, Rajasthan is undergoing training in the area of “Raw Material Pulping & Bleaching of Pulp”.
- Mr. Kewal Sinha, M.Sc student from Forest Research Institute, Dehradun, is undergoing training in the area of Elemental Chlorine free bleaching.
- Two M.Tech students from Vanasthali Vidhya Peeth, Jaipur completed training/project in Biotechnology Division.
- One M.Sc. Student from Sam Higginbottom Institute of Agriculture Technology and Science, Allahabad completed two months training in Central Instrumentation Laboratory.

LECTURES AND PRESENTATIONS

LECTURES DELEVERED

- Dr. B.P. Thapliyal, Scientist E-II gives the lecture on “**Development in surface characterization of paper and paper board**” during the Cess Training Program on January 19-20, 2016.
- Dr. R.D. Godiyal, Scientist E-I gives the lecture on “**Demonstration on Optical and Microscopic Evaluation of Paper**” during the Cess Training Program on January 19-20, 2016.
- Dr. Sanjay Tyagi, Scientist C gives the lecture on “**Facilities for Testing of Dynamic paper properties at CPPRI**” during the Cess Training Program on January 19-20, 2016.

REPORTS AND PUBLICATIONS

Reports

Verification report of Action Plan for Charter Compliance

- BILT (Unit Shree Gopal) , Yamunanagar

Charter Progress Verification Quarterly Report

- Magnum Ventures Ltd., Sahibabad , Uttar Pradesh
- Shree Sidhali Paper Mills Ltd.,Muzaffarnagar, Uttar Pradesh
- Shree Bhageshwari Paper Ltd.,Muzaffarnagar, Uttar Pradesh
- Silverton Pulp & Paper Private Ltd., Muzaffarnagar, Uttar Pradesh
- Garg Duplex & Paper Mills Pvt. Ltd., Muzaffarnagar, Uttar Pradesh
- Star Paper Mill Ltd., Saharanpur, Uttar Pradesh
- BILT Unit Shree Gopal , Yamunanagar
- NS Paper Ltd., Muzaffarnagar, Uttar Pradesh
- Garg Duplex & Paper Mills Pvt. Ltd., Muzaffarnagar, Uttar Pradesh
- Sidharth Paper Ltd., Kashipur, Uttarakhand

- Siddheshwari Paper Udyog Ltd., Kashipur, Uttarakhand
- Shakti Kraft and Tissues Mill Ltd., Muzaffarnagar, Uttar Pradesh
- Sahota Papers Ltd., Jaspur, Uttar Pradesh
- Suyash Paper Mills Ltd., Basti , Uttar Pradesh
- Rajlakshami Paper & Board Ltd., Bazpur, Uttarakhand
- Suyash Kraft and Paper Ltd., Muzaffarnagar, Uttar Pradesh
- Shree Badri Kedar Papers Pvt. Ltd., Bijnor , Uttar Pradesh
- Gangotri Paper Mills Ltd, Narsan Kalan , Uttarakhand
- Sainsons Paper Industries Ltd., Kurukhestra, Haryana
- Shree Bhageshwari Paper Ltd., Unit-I Muzaffarnagar,Uttar Pradesh
- Shree Bhageshwari Paper Ltd., Unit-II Muzaffarnagar, Uttar Pradesh
- Genus Paper & Boards Ltd., Moradabad, Uttar Pradesh
- Sandeep Paper Mills Pvt Ltd., Noida, Uttar Pradesh
- Tehri Pulp and Paper Ltd., Muzaffarnagar , Uttar Pradesh
- Multiwal Pulp & Board Mills (P) Ltd..Kashipur Uttarakhand
- Cheema Papers Ltd.,Kashipur, Uttarakhand
- PSB Papers Ltd., Kashipur, Uttarakhand
- Chamunda Papers Pvt. Ltd., Hapur ,Uttar Pradesh
- Dev Priya Papers Pvt. Ltd., Meerut , Uttar Pradesh
- New Bonanza India Ltd., Meerut , Uttar Pradesh
- Sangal Paper Ltd., Mawana, Uttar Pradesh
- Mahalaxmi Craft & Tissues Pvt. Ltd., Muzaffarnagar, Uttar Pradesh
- Tirupati Balaji Fibers Ltd., Muzaffarnagar, Uttar Pradesh
- Shakumbhari Pulp & Paper Mills Ltd., Muzaffarnagar, Uttar Pradesh
- Silverton Pulp & Paper Private Ltd., Muzaffarnagar, Uttar Pradesh
- Parijat Paper Mills Ltd., Muzaffarnagar, Uttar Pradesh
- Galaxy Papers Pvt. Ltd., Muzaffarnagar, Uttar Pradesh

Water Audit

- Dev Priya Industries Private Ltd., (Unit I) Meerut, Uttar Pradesh
- Dev Priya Industries Private Ltd., (Unit II) Meerut, Uttar Pradesh
- Gangoti Paper Mills Ltd., Narsan Kalan , Uttarakhand

ETP Performance Evaluation

- BILT (Unit Shree Gopal) , Yamunanagar

ETP Adequacy Assessment

- Vishwanath Paper & Boards Ltd., Jaspur, Uttarakhand
- Katyayini Paper Mills Pvt Ltd.,
- BILT Unit Shree Gopal , Yamunanagar
- Shree Badri Kedar Papers Pvt. Ltd., Bijnor , Uttar Pradesh
- Sandeep Paper Mills Pvt., Ltd. , Noida, Uttar Pradesh

Hazardous Waste Audit

- Century Pulp and Paper Ltd., Lalkua , Uttarakhand
- Chandpur Indsuries Ltd., Noorpur , Uttar Pardesh
- Khatema Fibers Ltd., Khatima , Uttarakhand

Publications

- Omar L.M. Kamoga, J.B. Kirabira, J.K. Byaruhanga, R.D. Godiyal, Kumar Anupam; **Characterisation and evaluation of pulp and paper from selected Ugandan grasses for paper industry**; Cellulose Chemistry and Technology 50 (2) (2016) 275-284.
- Kumar Anupam, Arvind Kumar Sharma, Priti Shivhare Lal, Suman Dutta, Sudip Maity; **Preparation, characterization and optimization for upgrading *Leucaena leucocephala* bark to biochar fuel with high energy yielding**; Energy (2016) Accepted <http://dx.doi.org/10.1016/j.energy.2016.03.100>

Mill Visits

CPPRI Scientists visited the following mills and other organisations during January –March 2016

S.No	Mill name	Purpose
1.	Multiwal Pulp & Board Mills (P) Ltd..Kashipur Uttarakhand	Charter Progress Verification
2.	Ballarpur Industries Limited. Unit: Shree Gopal Yamunanagar, Haryana	For Environmental inspections
3.	Minsitry of Commerce & Industry , New Delhi	<ul style="list-style-type: none"> • CoA Meeting • UNIDO Project Meeting • To discuss the Issues related to subsidy claim of Bharmputra Papers Ltd., under CCIS 2007.
4.	Bindals Papers Mills Ltd. & Siddheshwari Paper Mill Ltd., Muzaffarnagar, Uttar Pradesh	Industrial Training to M.Sc Students
5.	Dev Priya Industries Private Limited. Meerut, Uttar Pradesh (Unit –I & II)	Water Audit
6.	Kashipur Clusters Mills	Data Collection for UNIDO Project
7.	KR Pulp & Paper Ltd. Sahajahapur, Uttar Pradesh	Charter Progress Verification & ETP Adequacy Assessment
8.	Century Pulp and Paper Ltd., Lalkua, Uttarakhand	To facilitate industrial visit of with UNIDO Expert & UNIDO- ICISD officials

		Ambient Air Quality, Stack Emission Quality, Waste Water Quality Monitoring
9.	Mohit Paper Mills Limited. Bijnor Uttar Pradesh	Charter Progress Verification
10.	Rama Paper Mills Limited., Bijnor, Uttar Pradesh	Charter Progress Verification
11.	Dev Priya Product Private Limited. Meerut, Uttar Pradesh	Charter Progress Verification
12.	Maruti Papers Limited., Shamli, Uttar Pradesh	Charter Progress Verification
13.	Nikita Paper Limited. Shamli, Uttar Pradesh	Charter Progress Verification
14.	Paswara Papers Limited. Meerut, Uttar Pradesh	Charter Progress Verification
15.	Sangal Papers Ltd. Meerut, Uttar Pradesh	Charter Progress Verification
16.	Anand Duplex Ltd Unit-I Unit-II. Meerut, Uttar Pradesh	Charter Progress Verification
17.	Shree Badri Kedar Papers Private Limited Najibabad Uttar Pradesh	Charter Progress Verification
18.	The International Paper APPM Pvt. Ltd., Andhra Pradesh	Charter Progress Verification
19.	Naini Tissues Limited., Kashipur, Uttarakhand	Charter Progress Verification
20.	Naini Papers Limited., Kashipur , Uttarakhand	Charter Progress Verification
21.	Siddheshwari Paper Udyog (P) Ltd., Kashipur, Uttarakhand	Charter Progress Verification
22.	Sidharth Papers (P) Limited. Unit-I & Unit-II, Kashipur Uttarakhand	Charter Progress Verification
23.	Star Kraft Papers Pvt. Limited., Meerut ,Uttar Pradesh	Charter Progress Verification
24.	Janki Newsprint Limited., Meerut, Uttar Pradesh	Charter Progress Verification
25.	The West Coast Paper Mill Ltd., Dandeli, Karnataka	Calibration of Water flow meter / Water Audit
26.	Sandeep Paper Mills (P) Limited ., GautamBuddh Nagar, Uttar Pradesh	Charter Progress Verification
27.	Bindals Duplex Limited. Unit-I & Unit-II, Muzaffarnagar, Uttar Pradesh	Charter Progress Verification Water Audit
28.	Parijat Paper Mills Limited. Muzaffarnagar, Uttar Pradesh	Charter Progress Verification Water Audit
29.	Meenu Paper Mills (P) Limited., Muzaffarnagar Uttar Pradesh	Charter Progress Verification
30.	Shree Sidhali Paper Mills Limited., Muzaffarnagar Uttar Pradesh	Charter Progress Verification
31.	Shri Ramchander Straw Products Limited. Moradabad Uttar Pradesh	Charter Progress Verification
32.	Paper Mill Association Muzaffarnagar, Uttar Pradesh	Meeting related Implementation of CPCB charter

33.	Shree Bhageshwari Papers (P) Limited. Unit-I & Unit-II., Muzaffarnagar, Uttar Pradesh	Charter Progress Verification
34.	Sahota Papers Limited., Jaspur, Uttarakhand	Charter Progress Verification
35.	Prolific Papers (P) Ltd., Kashipur, Uttarakhand	Charter Progress Verification
36.	Cheema Papers Ltd. 9th Km. Stone, Kashipur, Uttarakhand	Charter Progress Verification
37.	Vishwanath Paper & Boards Limited., Jaspur Uttarakhand	Charter Progress Verification
38.	Devrishi Papers Pvt. Ltd., Jaspur- Uttarakhand	Charter Progress Verification
39.	PSB Papers Limited. Udham Singh Nagar, Uttarakhand	Charter Progress Verification
40.	Rajlakshmi Paper & Board Pvt. Ltd. U.S. Nagar Uttarakhand	Charter Progress Verification
41.	Indian Paper Manufactures Association , New Delhi	To attend Meeting related CPCB Charter Implementation
42.	Magnum Ventures Ltd. , Ghaziabad , Uttar Pradesh	Charter Progress Verification
43.	Tehri Papers Limited, Muzaffarnagar	For conducting Chemical Recovery adequacy study
44.	Trident Limited, Barnala, Punjab	Desilication and Liquor Heat Treatment studies at pilot plant scale
45.	M/s Satia Industries Ltd., Muktsar	Commissioning of liquor heat treatment plant
46.	M/s Godawari Biorefineries Limited, Karnataka	Commissioning of pilot plant for production of high grade cellulose
47.	Trident Paper Mill, Barnala, Panjab	for conducting trials of Desilication and Liquor Heat Treatment (LHT) Pilot plant
48.	Bindal Paper Mills Ltd., Muzaffarnagar, Uttar Pradesh	for the collection of Bagasse raw material and unbleached pulp.

STAFF NEWS

Retirement

Name	Designation	Date of Superannuation
Shri Satya Pal Singh	TG VI	29.2.2016

Visitors

- Shri Vikas Kumar , UNIDO- IC- ISID, New Delhi
- Mr Jani Mannikko , University of Helsinki, Finland
- Mr Ovvind Erickson , Paper & Fiber Research Institute, Norway
- Shri M.K. Gupta, Dr Kashikar & Shri H.K. Madan , BILT Group
- Dr. N.K. Bhardwaj & Dr.Sunil Kr, ACIRD, YamunaNagar, Haryana
- Shri Suresh Kumar, Cochin Minerals & Rutile Ltd , Kerala
- Mr. Naresh Kumar, Century Pulp & Paper, Nainital, Lalkuan, Uttarakhand
- Dr Mohan Lal , Khatema Fibers Ltd., Khatima, Uttarakhand
- Shri D.K. Singhal , Chandpur Enterprises Ltd., Chandpur, Uttar Pradesh
- Ms Laxmi Prasad & Mr. Piyush Shah , International Paper
- Shri A.K Atri , Orient Paper Mills Ltd

Interaction with Industry / Companies

- Interaction with M/s KR Pulp and Papers Ltd., Shahjahanpur, UP regarding sponsored project on Liquor Heat Treatment of Black Liquor.
- Interaction with M/s Trident, Barnala, Punjab regarding sponsored project Targeting Improved Thermal Efficiency and Efficiency of Chemical Recovery System.
- Interaction with M/s Tehri Papers Ltd., Muzaffarnagar to study the adequacy of LTI based Chemical Recovery System.
- Interaction with M/s Tamilnadu Newsprint and Papers Ltd., Tamilnadu for demonstration of Disc Mill for Efficient Depithing of Bagasse.
- Interaction with M/s Security Paper Mill, Hoshangabad, Madhya Pradesh to conduct studies on Paper Machine.

Industrial Tour of M.Sc (Cellulose & Paper Technology) students

The students of M.Sc (Cellulose & Paper Technology) went on a industrial tour along with Dr. S.Panwar & Dr.Nitin Endlay to Bindal Papers Ltd., Siddeshwari Industries (P) Ltd, Muzaffarnagar to get conversant about the technologies and process adopted by agro based, waste paper based and wood based pulp and paper mills for paper making as well as effluent treatment systems adopted by the mill.

Awards

- Kumar Anupam, SSA reviewed papers for following international Journals: Journal of polymers and the Environment (Springer); Environmental Progress and Sustainable Energy (John Wiley); Chemical Engineering Communications (Taylor and Francis); Bioresource Technology (Elsevier); Solar Energy (Elsevier); International Journal of Biodiversity and Conservation (Academic Journals); Chemical Engineering Journal (Elsevier)
- Kumar Anupam, SSA is awarded Certificate of Reviewing for getting Recognized Reviewer Status from Chemical Engineering Journal (Elsevier)

Abstracts

Omar L.M. Kamoga, J.B. Kirabira, J.K. Byaruhanga, R.D. Godiyal, Kumar Anupam; Characterisation and evaluation of pulp and paper from selected Ugandan grasses for paper industry; Cellulose Chemistry and Technology 50 (2) (2016) 275-284.

Abstract: Non-wood fibrous materials and recycled fibres offer an opportunity to decrease or replace the use of wood fibres in the production of pulp and paper in countries with insufficient forest resources. The aim of this study was to characterise and evaluate the pulp and paper derived from four Ugandan grasses, namely *Cymbopogon nardus*, *Paspalum notatum*, *Saccharum officinarum*, and *Digitaria scalarum*, obtained using Soda-AQ and Kraft pulping methods for their potential use in the paper industry. The fibre morphology, as well as the physical properties, of both pulp and handmade paper sheets was analysed. The pulp and paper were identified with reasonable yield, medium viscosity, high bleachability, short and narrow fibres, and moderate paper strength. *Saccharum officinarum* pulp was characterised with high weighted average fibre length (1.143 mm), moderately high fibre width (18 μm), slenderness ratio (68), brightness (71.27%) and low kappa number (11.9); and the paper sheets with a tear index of 7.05 mNm²/g, while *Cymbopogon nardus* pulp was characterised with higher yield (44.20%), viscosity (915 cm³/g), low kinked fibre (20%) and curl (6%). The pulps from the two grasses superseded the others. Nevertheless, all the four grasses were recommended for pulp and paper production. **Keywords:** Soda-AQ and Kraft pulping, fibre morphology, paper sheets, strength properties, sustainability

Kumar Anupam, Arvind Kumar Sharma, Priti Shivhare Lal, Suman Dutta, Sudip Maity; Preparation, characterization and optimization for upgrading *Leucaena leucocephala* bark to biochar fuel with high energy yielding; Energy (2016) Accepted <http://dx.doi.org/10.1016/j.energy.2016.03.100>

Abstract: Biochar fuel (CH_{0.50}O_{0.19}N_{0.06}) was prepared from *Leucaena leucocephala* bark (CH_{2.80}O_{0.53}N_{0.03}) through the slow pyrolysis process adopting design of experiments technique. Modelling and optimization of the slow pyrolysis process was respectively carried out implementing five level central composite design and numerical technique under response surface methodology. Pyrolysis temperature and time were taken as independent parameters while biochar fuel yield, bulk density, higher heating value, energy density and

energy yield were chosen as dependent parameters. The optimal pyrolysis temperature and time were estimated to be 367.47 °C and 135.38 min respectively. These optimum values of temperature and time gave biochar yield 47.29%, bulk density 319.73 kg/m³, higher heating value 23.30 MJ/kg, energy density 1.21, and energy yield 56.55%. The developed quadratic models were checked using ANOVA (analysis of variance) technique for their validity and degree of fitness. The high values of 'Adequate precision', R² and its negligible difference with 'AdjustedR²' as well as 'PredictedR²' for each model indicated that the fitted empirical models can be used for prediction with reasonable precision. The quadratic models revealed strong interaction between pyrolysis temperature and time towards preparation of biochar fuel. It was further observed that desirability of pyrolysis temperature (0.91) is more than pyrolysis time (0.63). Comparison of Van Krevelen diagram of present biochar fuel with several other biochar fuels and coals showed that prepared biochar has better fuel properties in comparison to raw bark. **Keywords:** Biomass, bioenergy, slow pyrolysis, parametric interaction, physicochemical properties © 2016 Published by Elsevier