



# CFRI NEWSLETTER



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Established in November 1946, Central Fuel Research Institute is a unique Institute of its kind in India under CSIR, New Delhi to conduct research in different areas of Fuel Science and Technology with emphasis on coal and lignite.

**Mission:** Enhance the position of the Institute as a premier R&D centre for technology development and transfer by forging strategic alliance with other agencies and continuously strive for excellence in the area of potential expertise for generation of basic knowledge, innovation, and advanced concepts in science and technology for economic, efficient, and environmentally safe energy management.

## ENERGY MANAGEMENT

The Energy Management Cell, Nagpur has got temporary accreditation from Bureau of Energy Efficiency (BEE), Ministry of Power. It has got good response from Industries of various sectors like Dairy, Power, Refinery, etc. and is presently conducting Energy Audit in Jalgaon Jilla, Sahakari Dudh Sangh, Sangamner Dudh Sangh and Thermal Power Station of 50MW unit of Neyveli Lignite Corporation.

## POWER COAL DIVISION: THRUST AREA

- (a) Combustion characteristics of Indian coals were determined by using TGA/DSC, Drop Tube Furnace (DTF) and Fuel Evaluation Test Facility (FETF)
- (b) Pilot study was made for the migration of UHV to GCV based gradation system

## DROP TUBE FURNACE (DTF):

It is a valuable tool to determine the combustion characteristics of coal. The DTF is situated in combustion section, CFRI. It is a vertical, electrically heated tube furnace made of ceramic tube surrounded by canthal wire. The temperature of the furnace is heated upto 1100°C. It has five zones. Solid and gaseous sample can be collected from different ports

of the furnace. Also there is provision for bottom ash and fly ash samples collection.

## FUEL EVALUATION TEST FACILITY (FETF):

It is a pilot scale combustion test rig. From FETF, we can study the combustion characteristics of pulverized coal. The special features of this pilot plant are: Combustion behaviour of solid fuels, coal, lignite etc. : Provision of sample (solid and gas) collection along the length of the furnace with cooling arrangement; Slagging rates and heat flux reduction; Fouling rates and heat flux reduction; On line gas (O<sub>2</sub>, CO, CO<sub>2</sub>, Nox & Sox) analysis; Erosion study; CCTV Camera for flame photography; and DAS for data recording and monitoring.

## COAL CARBONIZATION ACTIVITIES

Coal Carbonization Division is always in the process of enlightening its R&D and S&T services in most sustainable and market acceptable way. In the area of coke making, conventional technologies along with potentially sustainable technologies in the present context are being taken into consideration. Development of expertise, especially in the area of development of coke oven technology, selection of quality parameters of coal and establishment of most economically viable carbonization conditions, is in

progress. In the area of coke oven technology, coal carbonization division has already developed new generation non-recovery coke oven. Newly designed oven is energy efficient, cost competitive and environment friendly. This non-recovery type coke oven has emerged out as a commercially successful technology and already transferred to different commercial houses almost every corner of the country.

### VISIT OF JAPANESE DELEGATION

Dr K. Yudato, from JFE, Techno-Research Corporation, Tokyo, Japan along with Dr. Gulab Singh, Consultant, Fly Ash Utilization Programme, New Delhi visited CFRI on 31st Jan. 2006. This delegation had meeting with all Heads of Division on the subject Feasibility of Transfer of Clean Coal Technology of Japan to India. They had also interactions with CFRI Scientists and collected information on the clean coal technology work in India.



Dr. K. Yudato, discussing with Dr S.C. Roy, Director and with other scientists in Director's Office

### PAPER IN PRESS

1. Shripal Singh and M. K. N. Yenkie, "Scavenging of Priorities Organic Pollutants from Aqueous Waste using Granular Activated Carbon", in J. Chin. Chem. Soc., Vol. 53, NO. 2, 2006

### MARTYRS DAY

Mahatma Gandhi was assassinated on 30th January 1948 by a cruel Nathu Ram Godse. Mahatma Gandhi who during his whole life followed the practice of non-violence and spirit of tolerance, was shot dead.

Two minutes silence was observed on 30th January 2005 at 11.00 a.m. By observing this we remember our beloved father of nation Mahatma Gandhi and his sacrifices for the cause of independence of India from British Empire.

### TRAINING ON E-JOURNAL

E-Journal Training of scientist and technical staff was organized during 2-3 Nov. 2005. this training was imparted for easy access of e-journals from Eleven publishers, mainly M/s. Elsevier. Mrs. Nishy P from E Department, NISCAIR, New Delhi had come for giving this training.

### NATIONAL SCIENCE DAY

Prof. Madan Mohan Singh, Professor and Head, Applied Chemistry, Institute of Technology, Banaras Hindu University, Varanasi delivered National Science Day Lecture on 28.02.2006. He spoke on "Corrosion and its Prevention: Concept to Commissioning". Dr S. C. Roy, Acting Director presented welcome address. Dr. Abhijit Sarkar spoke about National Science Day and reminded the day of opening of CFRI at present premises, which was also attended by Sir C. V. Raman. Dr. Sarkar also quoted some of the lines of Raman's speeches in which, how he had addressed about coal for the first time in his life.

### HINDI ADMINISTRATIVE WORKSHOP

Rajbhasha Unit organized a three-day workshop from 20-22 February 2006. The purpose of this workshop was to train the scientific, technical and administrative staff in their day-to-day work of Hindi. Shri Avinash Singh, Zonal Manager, Bank of India, Dhanbad was the Chief Guest. Shri Sita Ram Sharma, Sr. Hindi Officer, DGMS, Dhanbad provided training on day to day work in offices. Shri. C. R. Yadav, Head, Hindi Deptt. BHU, Varanasi and Pro. R. K. Saha, Member Research Council, graced the occasion.

### TECHNOLOGY TRANSFERRED TO

1. MoU was signed with M/s. Jai Maa Kali Coke & Mineral, Orla, P.O. Kaju, Hazaribagh-825 316, Jharkhand for the process-Setting up ovens for

production of coke for domestic uses (Soft Coke) on 29.03.2006.

2. MoU was signed with M/s Jharkhand Fuels, Huwag, P.O. Balsagra, P.S. Mandu, Hazaribagh, Jharkhand for the process-Setting up ovens for production of coke for domestic uses (Soft Coke) on 29.03.2006.

### NEW PROJECTS RECEIVED

1. Sampling and analysis of imported coal at ports ends MV HARDWAR.
2. Characterization study of coal seams II, III, IV of Blocks, IV/4, IV/3 Gare Area, Mand, Raigarh Coalfield through Borehole core study.
3. Sampling and analysis of imported coal unloaded at port ends like: Vizag, Paradeep, Haldia–MV Song Shan Hai and MV Patliputra.
4. Sampling and analysis of imported coal unloaded at port ends Vizag, Paradeep, Haldia MV SUNNY ACE.
5. Pilot scale studies in electrically heated oven of imported coal to assess the nature of coke quality.
6. Beneficiation study of crushed ROM coals from lower Kusumunda seam, Kusumunda Projects, Korba coalfield.
7. Thermal and energy audit of Thermal Power Station –1, Neyveli Lignite Corporation, Tamil Nadu at 50 and 100 MW Boiler Unit (CFRI Nagpur Unit).

### NEW FACILITIES/INSTRUMENT INSTALLED

Energy Management Cell, CFRI Nagpur Unit has procured following new instruments for improvement in infrastructure facilities to carry out energy audit in industrial sector.

- i) Ultrasonic flow meter for measuring flow rate of liquid/water
- ii) Flue Gas Analyzer

### NEW ARRIVALS IN LIBRARY

1. Annual Reports received from five different labs/institutes i.e. SERC, Chennai, NISTAD, New Delhi, Indian Academy of Science, Bangalore, CEERI, Pilani and IIP Dehradun.
2. Proceedings of NISTADS-WAITRO International Conference on ICT as an Enabling Tool for

Sustainable Development: Challenges and opportunities for Research and Technology Organization on 29-30 August 2005.

3. Indian Universities Technology Database-Vol. 1 by UGC.
4. Health Technology for Fulcrum of Development for the Nation: The Road Ahead–Report of Indian Science Congress–held at Ahmedabad, January 3-7, 2005 by NISCAIR.

### PATENT ON: COAL AND ITS UTILIZATION

1. US Patent No. 2006027488, Feb. 9, 2006

*Title – Process for Producing Fuel*

*Inventors – Gauthier; Richard; (Longueuil CA)*

*Abstract – A fuel is produced from bitumen by precipitating a substantial portion of asphaltenes from bitumen by contacting the bitumen with a low alkane solvent. Suitable burners include a fluidized bed boiler, a circulating fluidized bed boiler and a pitch boiler which utilize either pre-combustion sulfur sorbents or post-combustion flue gas desulfurization. The sulfur in emissions can be used to produce sulfuric acid. The process uses a low cost fuel, generates steam, power and sulfuric acid and meets all emission requirements for SO<sub>2</sub>, NO<sub>x</sub>, and PM.*

2. US Patent No. 20060032327, Feb. 16, 2006

*Title – Briquetting of lime based products with carbon based additives*

*Inventors – Huege; Fred R.; (Colleyville, TX); Ingram; Kevin D.; (Fort Worth, TX)*

*Abstract – A method is shown for briquetting quicklime fines. A source of quicklime or dolomitic quicklime fines is combined with a binder in the form of a pseudo-plastic carbon containing material which will deform under briquetting conditions of elevated temperature and pressure and flow and which will also return to a solid phase and bind the quicklime fines upon cooling. An external force is applied to the mixture of fine and binder, as with a briquetting machine, sufficient to form the mixture into a briquette having requisite strength and durability characteristics. Suitable classes of carbon containing materials include Gilsonite.RTM., a solid coal tar pitch and recycled plastics such as polyethylene and polypropylene. (Source: [www.uspto.gov](http://www.uspto.gov))*

## NEWS FROM WORLD AROUND:

### RENEWABLE FUEL OBLIGATION IN CANADA

The Canadian government recently announced its willingness to establish a national Renewable Fuels Standard (RFS) to encourage the development of the renewable fuels industry in the country. The measure which has the backing of both the Liberal and Conservative parties will call for a minimum of 5 per cent mix of renewable fuels in gasoline and diesel by the end of 2010.

The RFS would reduce greenhouse gas (GHG) emissions by 4 mega tones, provide 1500 to 2000 jobs in rural areas, earn \$2-3 billion in private capital investment, and provide value added market for at least 200 million bushels of grain. Governments around the world, including the European Union, the United States, China, India, Japan, and Brazil, have all introduced renewable fuel content requirements. Three provinces in Canada—Saskatchewan, Manitoba and Ontario have also done so.

Once the RFS becomes law in Canada, it will take about four years to fully develop the bio diesel and ethanol industries there, depending on the availability of the agricultural raw material. According to experts at the Canadian Renewable Fuels Association (CRFA), this should not be a problem since enough feedstock is available to meet the demand. A recent national poll found that 83 per cent of Canadians believe that the government should do everything they can to make renewable fuels available, while 81 per cent support federal legislation requiring all gasoline sold in Canada to contain renewable fuel.

*(Source: Green Energy-Vol.2 No. 1, Jan.-Feb. 2006)*

### HONDA MOTOR TO MASS PRODUCE SOLAR CELLS

Leading Japanese auto manufacturer, Honda Motor is venturing into the renewable energy market by mass producing next generation solar panels for household and industrial use by March 2007. According to reliable sources, the company would spend \$86.5 million on its factory in Kumamoto prefecture in southern Japan. The solar cells would

be composed of non-silicon compound materials, consuming half as much energy and generating 50 per cent less carbon dioxide during production as compared with conventional solar cells made from silicon. The state-of-the-art solar panels, which have already been developed, but had earlier proved difficult to mass-produce, would ultimately cut production costs.

The company aims to generate annual sales of 5 billion to 8 billion yen (\$40 million to \$70 million) from solar cells once the factory's output reaches full annual capacity of 27.5 MW.

*(Source: Green Energy-Vol.2 No. 1, Jan.-Feb. 2006)*

### CFRI IN MEDIA

1. Three Day Hindi Workshop in CFRI (*Hindustan 21.02.06; Aaj 21.02.06, and Dainik Jagran 21.2.06*)
2. Hindi Workshop concludes (*Hindustan 23.02.06*)

### EVENTS AHEAD

1. CFRI Foundation Day Celebration on 22 April 2006.
2. National Technology Day Celebration on 11 May 2006.

### OBITURY

Prof. B. K. Mazumdar, Former Director, Central Fuel Research Institute, Dhanbad died on 20.10.05 at his residence in Kolkata. He was Director from March 1983 to January 1985.

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