



# 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.

## NON-RECOVERY COKE OVEN

Coal carbonization division plays a key role in carrying out R&D activities and S&T services in the area of coke making and have also developed new generation non-recovery type 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 it has already been transferred to different commercial houses in almost every corner of the country.

## CONTROL OF HEAVY BLACK EMISSION FROM THE COKE OVEN

*(Durgapur Projects Ltd.)*

Coal blends, Coke, Tar from different points were taken and necessary tests were performed. Detailed monitoring of coke ovens have been done. It was observed that soft coal, used in blends, are mainly responsible for black emission. Occasionally hard coal were also found indicating characteristics of soft coal. Both hard coal and soft coal in most of the cases are found to be from different sources instead of single origin. Carbonization conditions were maintained as far as practicable but in some cases oven temperature were lowered down to check excessive oven pressure. In the by-product section tar was found characteristically different from conventional one. Necessary recommendations have been made.

## CHARACTERIZATION AND WASHABILITY STUDIES ON JHAMA (HEAT AFFECTED COALS) OF DIGWADIH

*(TATA, Jamadoba, Dhanbad)*

The main objective of the project is to study the cleaning potentiality of JHAMA by crushing the heat-affected coal at three different sizes followed by detailed characterization of feed and products aiming at 13% clean coal ash level. The project was completed and a report was submitted to the sponsor. The findings are as follows: The laboratory studies revealed that the overall characteristic of JHAMA sample with respect to the coking properties is very poor. Detailed washability studies followed by laboratory flotation of the fines revealed that theoretical yield of 25.3% at 13% ash level is achievable when the raw JHAMA is crushed to 75mm. The theoretical yield improved to 44.2% at an ash level of 13.2% when it was crushed to 10 mm. The washability data were used to predict yield at 13% ash level considering the normal  $E_p$  values of the individual units like Heavy Medium Drum and Heavy Medium Cyclone. A tentative flow scheme was suggested for beneficiation of Jhama.

## CSIR FOUNDATION DAY

Dr S.N. Upadhyay, Professor, Deptt. of Chemical Engineering and Technology, and Director, Institute of Technology, Banaras Hindu University, Varanasi delivered CSIR Foundation

Day Lecture on “Biotechnology: Our future hope for chemicals and Fuels” on 26 September 2006. Dr. D.D. Haldar, Acting Director, in his welcome address highlighted the achievements of CSIR. Dr. K.N. Bhattacharya Head, Technical Information read out the biodata of Prof Upadhyay. Dr. S.K. Hazra, Chairman, Organising Committee proposed vote of thanks. Dr. D.D. Haldar, Acting Director gave shawl, memento and samman Patra to the retirees, memento were also given to staff members who completed twenty five years of continuous service in CSIR. Prof. S.N. Upadhyay distributed prizes to the winners of essay competition. Judges of the essay competition were also honoured by him.



CSIR Foundation Day (Sitting on the dais L to R) Dr. K.N. Bhattacharya, Dr. D.D. Haldar, Prof S.N. Upadhyay and Dr. S.K. Hazra)

### RESEARCH COUNCIL MEETING

A special meeting of Research Council was held on 7th August 2006 at CFRI, Dhanbad at 10:30 am in J.W. Whitekar Hall on the issue of Consolidation of Core competencies of CMRI and CFRI. In this, following members were present Prof. R.K. Saha, Acting Chairman, Shri V.S. Verma, Shri A. Kalam, Prof. S.P. Mehrotra and Dr. S.K. Srivastava, (Acting Director).

### MEETING OF TMAC

Meeting of Transition Management Advisory Committee (TMAC) was also held on 7th August 2006.

### INDEPENDENCE DAY CELEBRATION

On the eve of sixteenth Independence Day (15.08.2006) Dr. S.K. Srivastava, Director (Acting) unfurled the tricolour in front of main building of CFRI. He took salute and delivered a speech highlighting the main achievements of the Institute during the last year and future plan of work. All the staff members and children attending the ceremony enjoyed. Sweets distributed at the end of programme.



Dr. S. K. Srivastava inspecting the platoon

### DEPUTATION ABROAD

1. Dr. S.K. Srivastava, Acting Director, CFRI visited Brazil during 18-20 September 2006 to attend G8 Energy and Innovation workshop as a senior member of Indian Delegation.

2. Dr. S.K. Srivastava, Acting Director, Dr. L.C. Ram, Scientist ‘F’ and Dr. A.K. Singh, Scientist E-1 visited USA to attend 23rd Annual International Pittsburgh Coal Conference at Pittsburgh, USA held on 25-28 September 2006.

### HONOUR/AWARD

1. Dr. S.K. Srivastava, Acting Director, CFRI was unanimously elected as Vice-chairman for International Advisory Board of International Pittsburgh Coal Conference, USA during the Annual International Pittsburgh Coal Conference held from 25 to 28 Sept. 2006 at USA.

### MEMBER OF EDITORIAL BOARD

1. Dr. L.C. Ram, Scientist ‘F’ has been made Member of Editorial cum Advisory Board of International Journal Current World Environment,

2. Dr. L.C. Ram, Scientist ‘F’ has been made Member of Editorial Board of International

Journal African Journal of Agricultural Research, South Africa.

### REVIEWER FOR JOURNAL

Dr. L. C. Ram, Scientist 'F' has been appointed reviewer of the following international journals:

1. Environmental Management (Springer, USA)
2. Environment Geology (Springer, Germany)
3. Journal of Environmental Management (Elsevier, USA)

### PAPERS IN SEMINAR/SYMPOSIA

1. Genesis of natural coke and its industrial utilization, AK Singh, NK Shukla, M Sharma, S K Choudhury, BN Roy, G Ghose and SK Srivastava, 23rd International Pittsburgh Coal Conference, Pittsburgh, USA, 25-28 Sept. 2006.
2. Cleaning potentiality of natural coke (jhamra) through washability investigation and its suitability for different end uses, A.K Singh, NK Shukla, A Mukherjee, M Sharma, N Choudhury, T Gauricharan and D D Halder, *ibid.*
3. Studies on abrasive propensity of thermal coals of India: Effect of ash and quartz contents. A. K. Bandopadhyay and R. Chatterjee, *ibid.*
4. Eco-friendly reclamation of mine-spoil for agro-forestry through fly ash and biological amendments, L.C. Ram, N.K. Srivastava, S.K. Jha and A.K. Sinha, *ibid.*
5. Direct sourcing of coal: part-i - solubilization of coal from north eastern region of India, D. Choudhury, R. Sen, G. Ghosh and S. K. Srivastava, *ibid.*
6. Process for synthesis of Flyash-Humic acid-Bt toxin-Copper nanocomposites as pesticides, L.C. Ram and V.A. Selvi, Nanotechnology in Agriculture, Department of Biotechnology, New Delhi, 11 Sept., 2006.
7. Coal Biotechnology: Role of chelators and metal ions in coal bio-depolymerization process, V.A Selvi, R.E Masto, L.C Ram and R Banerjee, National Seminar on Current Trends in Biotechnological Application, Centre for Research and P.G. Dept. of Botany, Thigarajar College Madurai, (Published) 20-21 July 2006.

### FACILITIES CREATED /INSTRUMENT INSTALLED

1. Hydro/Water-Only Cyclone Test Rig supplied by M/s Tega Industries, Kolkata was installed at the coal Washing Pilot Plant.

2. Two Roll crushers, One pulverizer and One Wet Tumbling Mill were installed and commissioned.

### MOU SIGNED

MoU for Design Know-how for setting up 10 ovens for production of coke for domestic uses (soft coke) with firm R.S. Fuels, Telipara, Hirapur, Dhanbad, Jharkhand on 16.8.2006.

### NEW PROJECTS RECEIVED

1. Washability Studies and Characterization of Cleans of Kalyanchak Stock of Coal of Dahibari OCP by BCCL, Barakar, Burdwan
2. Sampling and Analysis of Imported Coal Unloaded at Port Ends (Vizag/Paradeep and Haldia) – MV Prabhu Parvati by SAIL, Kolkata.
3. Sampling and Analysis of Imported Coal at Vizag Port by IMFA, Therubali, Raygada, Orissa.
4. Sampling and Analysis of Imported Coal Unloaded at Port Ends – MV Almasi (2006-2007) by SAIL, Kolkata.
5. Advice on Technologies for Beneficiation of BCCL Coking Coal of Jharia by Auroma Coke Ltd., Dhanbad.
6. Prefeasibility Study for Coal/Biomass Gasification in Collaboration with NCL, Pune .by Adani Energy Ltd. Ahmedabad, Gujrat

### PAPERS PUBLISHED IN JOURNALS

1. Estimation of gross calorific value of coals using artificial neural networks, S.U. Patel, B.J. Kumar, Y.P. Badhe, B.K. Sharma, S. Saha, S. Biswas, A. Chaudhury, S.S. Tambe and B.D. Kulkarni, FUEL, 19 July, 2007 (In Press).
2. Changes in soil biological and biochemical characteristics in a long-term field trial on a subtropical inceptisol, R.E Masto, P. K Chhonkar, D Singh, A. K. Patra, Soil Biology and Biochemistry, 38: 1577-1582, 2006.
3. Optimization process for biodepolymerization of lower rank Indian coals with reference to carbon and nitrogen sources, V.Selvi, Rintu Banerjee, L.C.Ram, Biosciences, Botechnology Research Asia Vol.3 (1a), 51-55, 2006.

## WORLD AROUND COAL, STEEL TO TAKE FRONT SEAT: FICCI

Some of the major core sector segments are projected to record a higher growth rate in the current fiscal year, compared to the last one. This will have a multiplier effect on a range of industries.

A latest finding by industry chamber FICCI shows that coal, electric power, oil and gas, crude oil, steel and aluminum are the major core sector segments that are projected to record higher growth rate in the current fiscal year. The report says that the higher projection for this year will translate into improved prospects of growth for a range of industries in the engineering, non-engineering and the services sectors.

The FICCI Core Sector Survey, based on responses from industry organization, associations, government and public sector undertakings, reveals that the coal sector is projected to grow at 6.5 per cent to 7 per cent in April-March 2006-07, compared with a growth of 6.4 per cent during the corresponding period of the previous year. Likewise, electric power is slated to grow at 5.5 per cent to 6 per cent against 5.1 per cent in last fiscal year, oil and gas 0.8 per cent to 1.4 per cent, whereas last year it had a negative growth of 1.4 per cent.

Crude oil is projected to have a 0.5 per cent to 1.2 per cent growth. Steel is projected to have a 7 per cent to 8 per cent growth as against 6.5 per cent in last fiscal year and aluminum is projected to have a growth of 8 to 9 per cent against 7.8 per cent in last fiscal year.

The survey confirms that the core sectors can attain projected growth rates and may even record higher growth than projected in the coming years provided some of the basic issues pertaining to each individual sector are addressed. The FICCI survey report points out that some of the these issues relate to inverted duty structure, anomalous import tariff, rising prices of basic raw materials with inadequate availability. Further, inadequate power and power cuts, poor quality of coal and unstable supply have become the major hurdles for user industries.

(Source-The Asian Age, July 31, 2006)

## PATENT INFORMATIO: ON COAL

1. US Patent No. 7,108,804, Sept. 19, 2006

*Title-* Supported nickel catalyst for synthesis gas preparation

*Inventors-* Lu, et al.

*Abstract-* In one aspect, the invention provides a catalyst for the production of synthesis gas, the catalyst comprising a) from about 0.1 to about 1.3% by weight of nickel that is supported on modified support, and b) a promoting agent. The catalyst can also comprise a dispersing agent. In another aspect, the invention provides a process for preparing the catalyst above, and a process for the catalytic partial oxidation of methane using the same catalyst.

2. US Patent No. 7,111,575, Sept. 26, 2006

*Title-* Synthetic fuel plant

*Inventors-* McGinnis

*Abstract-* A self-contained, floating, waterway supplied and moveable synthetic fuel plant includes apparatus for receiving components of and for making synthetic fuel of coal and binder for energy consumers. Processes are disclosed.

(Source- [www.uspto.gov](http://www.uspto.gov))

## CFRI IN MEDIA

1. Vision Document Planning – 2020 by CIMFR  
(*Hindustan-8.08.06, Prabhat Khabar- 8.08.06*)

2. Farewell to Former Acting Director, CFRI  
(*Aaj- 04.07.06*)

3. Independence Day Celebration at CFRI  
(*Prabhat Khabar- 16.08.06*)

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