



# 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.

## **DEMONSTRATION OF BULK USE OF POND ASH/FLYASH FROM KORADI, KHAPARKHEDA & CHANDRAPUR TPSs OF MSEB IN NEARBY FARMERS' FIELDS (*Fly Ash Utilisation Programme, TIFAC, New Delhi*)**

The project has recently been undertaken with the following objectives in view: (a) To characterize the pond ash/fly ash from Koradi, Khaparkheda and Chandrapur TPSs and soil (before cultivation of 1st crop and after harvest of last i.e. 8th crop) from different experimental fields for various physico-chemical parameters including trace elements/heavy metals, (b) To characterize the crop produce after harvest of alternate crop in respect of trace and heavy metals, (c) To characterize the field water before 1st crop and after harvest of last (8th) crop in respect of trace and heavy metals and (d) To popularize the bulk use of fly ash in agriculture sector amongst the local farmers through various extension programmes i.e. meetings/Kishan Gosthis/Audeo -Visual aids, in consultation with FAUP, District Agriculture Office, Block Development Office and Gram Panchayats.

After thorough discussion held in the Kisan Gosthi/meeting with the officials of TPSs (Koradi, Khaperkhera and Chandrapur), NABARD, State

Agriculture Department and local farmers, total 30 demonstration sites were selected in the farmers' fields for conduction of field trials with and without pond ash for cultivation of various local crops in the vicinity of each TPS. Samples of soil from demonstration sites (30 nos.) and pond ash from each TPS were collected. The composite soil samples and pond ash samples were processed and analysed for various physico-chemical parameters including trace and heavy metals. Recommendations for application of fly ash/pond ash were made on the basis of soil properties of the demonstration sites. Necessary arrangements were made for transportation of pond ash. The demonstration sites have been amended with pond ash. The experimental plots were prepared and various crops i.e. soybean, paddy cotton, etc were sown. The operational data were recorded including yield data after harvest of the crop. The crop produce (grain) samples have been collected and being processed for various analyses. The obtained results till so far are highly encouraging.

### **DR. S.C.ROY ACTING DIRECTOR CFRI**

Dr. S. C. Roy, senior most Scientist 'F' has been appointed Acting. Director, CFRI, Dhanbad with effect from 1st July 2005. He took charge from Dr. P. Samuel, Acting. Director, CFRI, who superannuated from service w.e.f. 30th June 2005.

### CFRI PARTICIPATED IN TRADE FAIR-2005

CFRI participated in India International Trade Fair-2005 (14-27 Nov. 2005) at Pragati Maidan, New Delhi. CFRI stall was under the Jharkhand State Pavilion. We had displayed our achievements and know-how through posters, pictures, model and products. This trade fair was inaugurated by the Prime Minister of India Dr Manmohan Singh on 14th Nov. 2005. Trade fair was full of crowd of knowledge seekers and buyers. Jharkhand State pavilion showed its rich mineral resources through various stalls in it. Important visitors from Jharkhand at the CFRI stall were Smt. Beela Rajeh, DC, Dhanbad; Shri S. K. Singh, Director, Industries; Shri Arjun Munda, Chief Minister, Jharkhand; Shri Saryu Rai, MLA, Jamshedpur West; and Shri Inder Singh Namdhari, Speaker, Jharkhand Vidhan Sabha.



Hon'ble Shri Arjun Munda, Chief Minister, Jharkhand State visited CFRI Stall on 18.11.05

### TRAINING PROGRAMME FOR NTPC

A training programme on "Coal Quality Control" was started from 21 Nov. 2005 for the newly recruited engineers and officers of the NTPC, NOIDA, Gautam Buddh Nagar, U. P. Training for second batch started from 16 Dec. 2005. Twenty seven participants took part in this programme. The National Thermal Power Corporation is an electricity producing agency of the nation. This training will be very useful and turning point for the beginners of the coal users in the thermal power plants.

### DIAMOND JUBILEE YEAR OF CFRI

It is a matter of great importance that CFRI has entered in its Diamond Jubilee year on 17 Nov. 2005. It is one of the prestigious institutes of CSIR and first

among the chain of 38 laboratories existing presently. Working in such an institute itself ameliorates the position of an employee in view of its high name and fame for which all the staff members are proud of it. Many of the staff members, who have already been retired now, helped in building of this institute up to this level, we recognize them and admire their valuable services at this moment. We all promise to take forward our institute to a great height. We have a chain of programmes to organise for the celebration of this momentous occasion.

### MEMORANDUM OF UNDERSTANDING

1. MoU was signed with M/s. Shiv Sagar Industries, New Madhukam, Road No. 8, Ranchi-1, Jharkhand for the Process: Setting up ovens for production of coke for domestic uses (soft coke) on 04.10.2005.
2. MoU was signed with M/s. Das and Deogharia Enterprises, Vil: Sabanpur, P.O. Salanpur, Burdwan-713357 for the Process: Smokeless briquetted fuel from low grade caking coal/washery by-products, etc. on 05.10.2005

### PAPERS FOR SEMINAR/SYMPOSIUM

1. Studies on possibilities of using natural coke (Jhama) in Industrial Application-Jahar Roy, A. K. Sharma, B. D. Saw, Nandita Chowdhury and S. K. Hazra, Coking coals and Coke making Challenges and Opportunities, RDCIS, SAIL, Ranchi, 12-14 Dec. 2005.
2. Evaluating the efficiency of the processes for increasing the bulk density of a coal charge for improving coke quality utilizing inferior grade/less matured coal by stamp charging-R. S. Yadav, U. Bhattacharjee, R. Chowdhury, T. K. Bhattacharjee, A. Bhattacharya and S. K. Hazra, *ibid*.
3. Prospects of Sustainable Bulk Use of Flyash in Agro- forestry, L.C. Ram and N.K. Srivastava 2nd International Congress of Chemistry and Environment, 24-26 Dec. 2005, Indore.
4. Eco-Friendly Reclamation of Abandoned Ash Ponds and OB Dumps Through Biological Means-N.K. Srivastava, L.C. Ram, S.K. Jha, R.C. Tripathi, A.K. Sinha, G. Singh, Fly Ash India

- 2005 International Congress, New Delhi, Dec. 4-7, 2005
5. Phosphorus Adsorption, Fixation and Fractions in Fly ash and Ash Amended Acid Soil- M. K. Mahato, R. E. Masto, V. A. Selvi, L.C. Ram, R. C. Tripathi, N. K. Srivastava, S. K. Jha and A.K.Sinha, *ibid*
  6. Agro-forestry-A Potential Area for Sustainable Bulk Use of Flyash-L.C. Ram, N. K. Srivastava, S.K. Jha, M. K. Singh, N.K. Vaishya, K. Gupta and G. Singh,*ibid*.
  7. Bulk Use of Pond Ash for Reclamation of Waste/Alkaline Land for Agriculture Purposes-R. C. Tripathi, L. C. Ram, A. K. Sinha, S.K. Jha and N K. Srivastava, *ibid*.
  8. Sustainable Improvement of Mining Environment through Selective Plantation -N.K Srivastava, L.C. Ram and A.K. Sinha, *Advances in Mining Technology and Management, IIT, Kharagpur. Nov. 30-Dec.2-2005*

#### PAPER IN HINDI

1. Swachhha Peene Ka Pani Adhunic Smaj Ke Nirman Main Aham Pahlu-Rajesh Kumar, Facing up the Challenges of Modern Civilization, Indian Academy of Social Science Congress, University of Lucknow, Lucknow 26-30 Dec. 2005.

#### BEST PAPER

A paper entitled “Phosphorus Adsorption, Fixation and Fractions in Fly Ash and Ash Amended Acid Soil- M. K. Mahato, R. E. Masto, V. A. Selvi, L.C. Ram, R. C. Tripathi, N. K. Srivastava, S. K. Jha and A.K.Sinha, Fly Ash India 2005 International Congress, New Delhi, Dec. 4-7, 2005 adjudged as the best paper by the peer review committee in the Session on Agricultural Application of Fly Ash.

#### VIGILANCE AWARENESS WEEK

Vigilance Awareness Week was observed from 8 Nov..2005. On the opening day all staff members took pledge for fighting against corruption. Oath was administered by the Dr S. C. Roy, Acting. Director. Various programmes were organized like essay competition on the subject “Role of Vigilance to

Prevent Corruption in Public Offices” on 9.11.05. A seminar was also organized on Vigilance Awareness on 10.11.05. Valedictory function and prize distribution was done on 11.11.05.

#### PATENT ON: COAL AND ITS UTILIZATION

- 1.US Patent No. 20050284793, Dec. 29, 2005

*Title* – Process for the Production of Needle Coke

*Inventors* – Bhattacharyya, Debasis; et al.

*Abstract* – A process is disclosed for producing needle coke from heavy atmospheric distillation residues having sulfur not more than 0.7 Wt%, which involves the steps of heating the feedstock to a temperature in the range of 460 to 540<sup>0</sup> C for thermal cracking in a soaking column under pressure in the range of 1 to 10 kg/cm.<sup>2</sup> to separate the easily cokable material, separating the cracked products in a quench column and a distillation column and then subjecting the hydrocarbon fraction from the bottom of the quench column and a heavy gas oil fraction having 10% true boiling point more than 370<sup>0</sup>C and 90% true boiling point not less than 480<sup>0</sup>C from the distillation column and/or any other suitable heavier hydrocarbon streams in a definite ratio depending on certain characteristic parameters to thermal cracking in a second soaking column at a temperature of 440 to 520<sup>0</sup>C., pressure in the range of 2 to 20 kg/cm.<sup>2</sup> in presence of added quantity of steam for formation of a mesophase carbonaceous structure which on steam stripping and cooling forms a solid crystalline coke suitable for manufacturing of graphite electrode of large diameter having co-efficient of thermal expansion lower than 1.1 times.10<sup>-6</sup>/.degree.C. measured on graphite artifact in the temperature range of 25 to 525<sup>0</sup>C.

2. US Patent No. 20050284421, Dec. 29, 2005

*Title* – Coal Combusting Boiler

*Inventors* - Penner, Albert, et al.

*Abstract* – A coal consuming boiler is provided with a combustion chamber having a divider of refractory material formed therein which separates the combustion chamber into primary and secondary combustion areas. A coal burner head for combusting coal is located in the primary combustion area. Primary combustion air is directed to the burner head while additional secondary combustion air is directed to the secondary combustion area to ensure that all combustible gases are thoroughly burnt up prior to the

exhaust existing the combustion chamber through a heat exchanger of the boiler. Exhaust tubes extending through the heat exchanger are configured in a horizontal double-pass configuration. A cleaner is provided in the form of nozzles associated with each of the exhaust tubes which are arranged to direct a high pressure flow of gas periodically therethrough for removing collected ash from the exhaust tubes to increase efficiency of the heat exchanger.

### SCIENTIFIC NEWS ON WORLD AROUND

Nobel chemistry for Frenchman, 2 Americans – Their Research Helps Make Stronger Plastic, Better Drugs and Food Preservatives. France's Yves Chauvin and Americans Robert H Grubbs and Richard R Schrock won the 2005 Nobel Prize in chemistry on 5<sup>th</sup> Oct. 2005 Wednesday, for their discoveries that let industry produce drugs and plastics more efficiently and with less hazardous waste. The trio won the award for their development of the metathesis method in organic synthesis - a way to rearrange groups of atoms within molecules that the Royal Swedish Academy of Sciences likened to a dance in which couples change partners. The process is used daily in the chemical, biotechnology and food industries to make stronger plastics, better drugs and improved food preservatives.

This represents a great step forward for 'green chemistry', reducing potentially hazardous waste through smarter production. Metathesis is an example of how important basic science has been applied for the benefit of man, society and the environment, the Nobel Prize committee said. Chauvin, 74 is the honorary director of research at the Institute Francais du Petrole in Rueil-Malmaison, near Paris. Grubbs, 63 is a professor of chemistry at the California Institute of Technology, and Schrock is a chemistry professor at the Massachusetts Institute of Technology. I feel pretty shaken, that means I can't talk very well. I had just gotten up and was having a little coffee. I felt that it couldn't possibly be true, but it was, Schrock told Swedish Radio after receiving the news. The three men share the 10 million-kronor (eurol million; \$1.3 million) award, which will be presented on December 10 in the Swedish capital. In 1971, Chauvin took the lead in the research by explaining how metathesis

reactions functioned and what types of metal compounds acted as catalysts in the reaction. With the recipe solved, the next step was to develop the actual catalyst.

Richard Schrock was the first to produce an efficient and metal-compound catalyst for metathesis. This was in 1990, the committee said. "Two years later Robert Grubbs developed an even better catalyst, stable in air, that has found many applications". The prize is the third Nobel announced this week. On Tuesday, Americans John L. Hall and Roy J Glauber and German Theodor W Haensch won the 2005 Nobel Prize in physics for their work in advancing the precision of optic technology, which could improve communication worldwide and help spacecraft navigate more accurately to the stars. The prize was given to the three for their work in applying modern quantum physics to the study of optics – a pursuit that has led to the improvement of lasers, optical clocks, GPS technology and other instruments. (Source-The Times of India, 06 Oct.2005).

### CFRI IN MEDIA

1.Coordination between Research Centre and Industries Necessary: Dr. S.K. Srivastava (Hindustan 22.11.05)

### EVENTS AHEAD

1. Republic Day Celebration on 26th Jan. 2006.
2. National Science Day on 28th Feb. 2006.

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