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

HIGHLIGHTS OF THE COMPLETED PROJECTS

DEMONSTRATION FIELD TRIALS IN FARMERS'FIELD FOR THE POPULARISATION OF BULK USE OF FLY ASH FROM DIFFERENT THERMAL POWER PLANTS OF UPRVUNL IN AGRICULTURE AND RECLAMATION OF DEGRADED WASTELAND

(UPRVNL, Govt. of U.P., Lucknow)

The project has been completed with full satisfaction of the sponsoring and monitoring agencies and the project completion report has already been submitted to the sponsoring and concerned agencies. The obtained results on bulk utilization of pond ash of Anpara, Obra and Harduaganj TPPs in agriculture sector and for reclamation of waste degraded/alkaline land around these TPPs holds great promise in amending the soil texture/fertility status and significantly increasing the yield (20-40%) of various crops over control on sustainable basis. After seeing the beneficial effects of pond ash from demonstration trials in selected farmers' field in improving the soil fertility and crop productivity, the farmers of the other villages in the vicinity of these TPPs are now fully convinced and have already come forward in a large number for using pond ash in their own fields. This will help UPRVUNL in solving the fly ash/pond ash disposal problem to a great extent.

THE INFLUENCE OF RANK & MACERALS/MICROLITHOTYPE AND PHYSIO-CHEMICAL COMPOSITION ON COMBUSTION OF PULVERIZED FUEL

(SSRC, Min. of Coal, Govt. of India, New Delhi)

The maceral distribution and their associations in coal of different rank play an important role in their combustion behaviour. This aspect, though acknowledged, has been rarely studied for Indian coals. To have a better understanding of the burning behaviour of Indian coals, systematic studies have been initiated to have a better insight to the burning behaviour of some Indian coals in Drop Tube Furnace (DTF).

Detailed chemical, physical and petrographic analyses have been done on two of four selected Indian coals of different coalfields. Samples characterized were overall sample, sample prepared at 34% ash level, enriched vitrinities and inertinite fractions. The char obtained from the different sampling ports in the DTF of these above mentioned samples are being studied under microscope along with their physical and chemical characteristics to assess the degree of burning and their morphology.

Compilation of relevant data were done and attempts were made to identify the relationship between the coal characteristics, macerals present in the parent coal, the char type produced thereof and their subsequent combustion behaviour. The study will help to have a better understanding of the combustion behaviour of Indian coals for better utilization of this primary energy resource for efficient power generation.

NRDC TECHNOLOGY AWARD TO CFRI SCIENTISTS

Dr Kalyan Sen, Director, CFRI and Dr. Dilip Kumar Chakraborty, Scientist were given NRDC Technology Award for technology development: 'A device for recovery of finest cleans

accumulated slurry at coal beneficiation plant and process thereof' on National Technology Day i.e. 11th may 2003. This award was handed over to the scientists by the Vice-President of India Hon'ble Shri Bhairav Singh Sekhawat in the presence of Hon'ble Dr. Murli Manohar Joshi, Union Minister for HRD & Science and Technology and other renowned dignitaries. This award consist of a cheque of Rs. One lakh .

NATIONAL SEMINAR

A National Seminar on Coal Science and Technology: Vision 2020 (Coal-2003) was organized during 20-21 April 2003. This seminar was inaugurated by Hon'ble Union Minister for Coal Shri Karia Munda. On this occasion Shri N. K. Sharma, Chairman, Coal India Limited, Kolkata and Prof. R. Natarajan, Chairman, RC-CFRI were present. In this seminar six technical sessions were held. Nineteen invited lectures and eighty-three papers were presented on various topics of coal, fly ash, and related subjects.

INAUGURATION OF FINE COAL TREATMENT PILOT PLANT

The fine coal treatment pilot plant sponsored by CCDAC, Ministry of Coal, CCDAC, Government of India was inaugurated by Hon'ble Shri Karia Munda, Union Minister for Coal, in the presence of Shri N. K. Sharma, Chairman, CIL, Kolkata, Prof. R. Natarajan, Chairman, CFRI-RC, Shri A. K. Sen, Coal Controller and member Secretary, CCDAC and Dr Kalyan Sen, Director, CFRI, Dhanbad.

WORKSHOP ON DOMESTIC CHULLAH

A Two-day workshop on domestic chullah was organized during 8-9 April 2003. This demonstration cum training on domestic chullah developed by CFRI was conducted under the aegis of CSIR Diamond Jubilee Celebration. This programme was inaugurated by Shri Subhash Singh, Block Development Officer, Jharia. In this programme, training was provided for both chullahs Angarmitra and Angarbandhu. Dr T. K. Goswami, Dr (Mrs.) Anjana Bhattacharya and Shri B. P. Mall scientists delivered lectures in training classes for the participants. 31 delegates of Jharia Consumer Protection Forum participated in the programme. They were given certificates in the valedictory session at the end of programme. Purpose of this training was to create environment for self-employment through the febrication, production and sale of these chullahas by the trainees.

CFRI FOUNDATION DAY

Dr H. S. Maiti, Director, Central Glass and Ceramic Research Institute, Kolkata delivered foundation day lecture on 'Fuel Cell-An eco-friendly power generating device' on 22nd April 2003. Prof. B. B. Bhattacharya, Director, ISM, Dhanbad also graced the occasion.

NATIONAL TECHNOLOGY DAY

National Technology Day was celebrated on 11th^{h} May 2003 in the Institute. On this occasion three lectures were made: Dr S. K. Hazra delivered lecture on " High tempeature non-recovery type coke ovens and their importance", Shri S.R. K. Rao on" Intellectual Property Right and its importance in technological development " and Sri Subhasis Biswas on " Drop Tube Furnace for combustion studies in pulverized coal".

NEW FACILITIES

Perkin Elmer Spectrum, GX-FT-IR Spectrometer which has been procured under CSIR modernization plan has been installed and is now under use.

MOU SIGNED

A licence agreement was made with M/s United Fuel Coke, Burdwan on the process for manufacturing of smokeless briquetted fuel from low grade caking coal/washery by -products on 18.06.2003.

TESTING AND ANALYSIS

Samples received for testing and analysis are as follows-
Coals:284, Coke:3, Oil:14, Ash:14, Gas:3, Water:2, Mis.:3.

MEMENTOS FOR CSIR DIAMOND JUBILEE

CSIR on its Diamond Jubilee year has made special type of calendar of five pages showing its excellence on modern art. This calendar was distributed to every personnel of CFRI. A table clock was also given to all employees of CFRI to celebrate this momentous occasion. This watch contains epigraphic names of all the CSIR laboratories on its dial.

CSIR DIAMOND JUBILEE EXHIBITON

CSIR is running in its 60th birth anniversary year and to celebrate it, various activities are being organized. An exhibition is also arranged in which 60 various important achievements of CSIR laboratories have been depicted through the large panels. These panels are moving place to place for the exhibition in India so that large part of the countryman could witness the achievements of the CSIR and also understand the importance of CSIR as a whole. This exhibition was organized at CFRI, Dhanbad during 20-25 April 2003 and was open for general public. This exhibition was also organised by CFRI Ranchi during 15-19 May 2003 at Bilaspur during 13-17 June 2003 and at Patna during 23-27 June 2003

UHV TO GCV SYSTEM FOR COAL

A meeting was held on 09.06.03 at CSIR Vigyan Kendra, New Delhi to discuss about system of grading of coal UHV (Useful Heat Value) to GCV (Gross Calorific Value). The meeting was presided by Dr. P.K.Mishra, Secretary, Min. of Coal, Govt. of India. Dr. R.A.Mashelkar, D.G., CSIR; Prof. R.Natarajan, Chairman, AICTE, New Delhi and Chairman, CFRI RC; Shri Laxmi Chand, Addl. Secretary, Ministry of Coal, Dr Kalyan Sen, Director, CFRI along with other dignitaries from different organizations like, CIL, MSEB, BIS, NTPC, CEA, BHEL, Planning Commission, New Delhi and CSIR New Delhi also attended the meeting..

HINDI WORKSHOP

A two-day Hindi workshop was organised during 28-29 May 2003. Sri Shrinath Singh Sr. Hindi Officer, BCCL, Dhanbad delivered lectures. Sri Shailabh and Sri G. K. Prasad also delivered lectures. Workshop was attended by large number of CFRI staff members.

PATENT INFORMATION: COAL AND ITS UTILIZATION

1.United States Patent Application 20030029088 A1 February 13, 2003
Title: Process for converting coal into fuel cell quality hydrogen and sequestration-ready carbon dioxide.
Inventors: Lyon, Richard K.; (Pittstown, NJ)
Abstract : This invention describes a process for burning coal to produce substantially pure hydrogen for use in fuel cells, together with "sequestration ready" carbon dioxide and a stream of oxygen depleted air for powering gas turbines

2.United States Patent Application 20030044337 A1 March 6, 2003
Title: Method for treatment of coal ash, and method for desulfurization.
Inventors: Furuya, Osamu; (Ichihara-shi, JP)
Abstract: This invention provides a process of treating coal ash by mixing with it water and desulphurisation in a coal combustion boiler system.

3.United States Patent Application 20030041782 A1 March 6, 2003
Title: Fly ash/mixed plastic aggregate and products made therefrom
Inventors: Malloy, Robert; (Londonderry, NH); Kashi, Moshen G.; (Burlington, MA); Swan, Christopher W.; (Needham, MA).
Abstract: The present invention is directed at a synthetic lightweight aggregate composition comprising fly ash and a mixture of two or more polymer components.
(Source-www.uspto.gov)

WORLD AROUND

THAILAND TO PRODUCE ETHANOL FROM CROPS

Thailand has launched a scheme to encourage the mass production of ethanol from locally grown crops. Thailand, a major exporter of food but an importer of energy, is hoping to use the ethanol to cut its dependence on energy imports, reduce the coast of energy, and help local farmers. Ethanols is produced from many Thai crops, including cassava, mize, sugar cane and coconut oil.

The Thai National Ethanol Commission has awarded licenses to eight private companies to produce ethanol from Thai crops. The eight companies include Khon Kaen Sugar Industry, Porn Vilai International Trading, International Gasohol, TSB Trading, and Sangsom Co. They have a combined capacity of 1.5 m liters of ethanol per day.

This scheme will greatly benefit sugarcane and cassava farmers with their produce prices, as well as saving [Thailand] foreign currency spent on petroleum imports. Thailand is the world's largest producer of tapioca (made from cassava) and a major producer and exporter of sugar. It is currently spending millions of dollars on farm subsidies each year. Locally produced ethanol would benefit farmers, as well as industry and consumers.

The state-owned petroleum companies PTT and Bangchak Petroleum will distribute the resulting ethanol/petrol mix to Thai petrol stations, which will see the fuel around 5% cheaper than ordinary petrol. The country also hopes to begin exporting ethanol to nearby China.
(Source-Chemical Industry News, June 2003)

CORNEL CHEMIST FINDS WAY TO MAKE BIODEGRADABLE PLASTIC THAT IMITATES

Finding an economical way to make a polyester commonly found in many types of bacteria into a plastic with uses ranging from packaging to biomedical devices is a long-held scientific goal. Such a polymer would be a "green" plastic, in that it would be biodegradable.

Geoffery Coates, a professor of chemistry and chemical biology at Cornell University, Ithaca, N.Y. , has partially achieved this goal by discovering a highly efficient chemical route for the synthesis of the polymer, known as poly (beta-hydroxybutyrate) of PHB. The thermoplastic polyester is widely found in nature, particularly in some bacteria, where it is found as intracellular deposits and used as a storage form of carbon and energy. And yet is shares many of the physical and mechanical properties of

petroleum-based polypropylene, with the added benefit of being biodegradable.

PHB currently is produced through a costly, energy-intensive biological process involving the fermentation of sugar. However, the Coates group's chemical route, once perfected, is going to be a competitive strategy. In order to produce the polymer, the process first requires a monomer, in this case a lactone called betabutyrolactone. This reacts with a zinc complex catalyst, discovered by Coates in the late 1990s, to make PHB.

The problem faced by the Coates group has been that beta-butyrolactone is a 'handed'' molecule, that is, it has two mirror images, like hands. Polymers produced from a mixture of two-handed forms have very poor properties. The researchers have been focusing on the development of a new catalyst for the production of the desired single-handed form of beta-butyrolactone, a process called carbonylation. The new catalyst, based on cobalt and aluminum, facilitates the addition of carbon monoxide to propylene oxide, an inexpensive ring compound called an epoxide. By using the commercially available handed form of porpylene oxide in the reaction, the corresponding handed form of the lactone can be formed rapidly.

Coates is convinced that, their carbonylation and polymerization processes are, in their opinion the best. A purely chemical route to a polymer that occurs in nature and is easily biodegradable is highly desirable.
(Source-Chemical Industry News, June 2003)

CFRI IN MEDIA

1. Workshop on domestic chullah, Hindustan Times, 10.04.03, Dainik Jagaran, 10.04.03, Hindustan 9.04.03
2. National seminar on coal science and technology vision : 2020 at CFRI on 20-21 April 2003 inaugurated by Shri Karia Munda and Inauguration of Fine Coal treatment pilot plant at CFRI by Shri Karia Munda Bihar Observer 21.04.03,Aaj 21.04.03, Ranchi Express 21.04.03, Dainik Jagran 21.04.03,Chamakta Aina 21.04.03, Prbhat Khabar 21.04.03, Hindustan 21.04.03 Awaj 21.04.03, The Times of India 21.04.03, Hindustan 23.04.03
3. CFRI Foundation Day celebration, Hindustan Times, 24.04.03, Hindustan 24.04.03, Prabhat Khabar 23.04.03, Dainik Jagran 23.04.03, Bihar Observer 23.04.03
4. CSIR Exhibition in CFRI - Hindustan Times, 25.04.03, Dainik Jagran, 24.04.03, Hindustan 25.04.03, Prabhat Khabar 24.04.03, Bihar Observer 24.04.03
5. National Technology Day celebration in CFRI - Prabhat Khabar 13.05.03, Ranchi Express 19.05.03, Hindustan 12.05.03
6. Director CFRI shares with his colleague tech award - Hindustan 10.05.03,
7. Project on Fly Ash of thermal power plant completed - Hindustan 29.05.03
8. CFRI's project of Biotechnological conversion of lignite to humic acid successful - Hindustan, 27.05.03
9. CSIR Diamond jubilee exhibition at Ranchi organized by CFRI, Ranchi Express, 15.05.03, Aaj 16.05.03, Dainik Jagran 16.05.03, Ranchi Express 16.05.03, Prabhat Khabar 16.05.03, 17.05.03, Hindustan Times 16.05.03, Hindustan 16.05.03, Telegraph 16.05.03, Dainik Jagran 17.05.03, Hindustan Times 17.05.03
10. Sixty five thousand new employment in leather industry : Ramaswami - Hindustan 17.06.03, Prabhat Khabar 17.06.03
11. Eastern coal best for thermal efficiency - Hindustan 10.06.03.

EVENTS AHEAD

1. Internal Management Council meeting on 3 rd July 2003
2. Visit of Parliamentary committee for Official Language on 16th July 2003
3. Workshop on Science Journalism from 23 to 26 July 2003
4. Republic Day Celebration on 15 August 2003
5. CSIR Foundation Day Celebration on 26 September 2003

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