



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.

CLEANING POTENTIALITIES OF MEGHALAYA COAL AND DEVELOPMENT OF BENEFICIATION CIRCUIT (*G.L.Coke Private Limited, Meghalaya*)

The raw coal was characterised for screen analysis, proximate, ultimate, sulphur and petrography constituents. The raw coal was crushed to 25 mm and screened at 13, 6, 3 and 0.5mm. Screen wise float and sink tests were carried out and washability and Mayers curve were plotted. The theoretical yield at 10% ash level was about 82%. Clean coal at 10% ash level was generated and detailed characterization was done. On the basis of the washability data obtained from the float & sink tests, a schematic flow sheet was developed. The theoretical yield was about 82.0 % at 8.1 % ash level. The coal can be effectively washed by incorporating Heavy Medium Cyclone after crushing at 25 mm.

WASHABILITY STUDIES ON KARHARBARI SEAM (BRAHMADIHA OCP) GIRIDIH FOR POWER AND FOUNDRY FUEL (*Castron Mining Technology, Giridih*)

Sample of coal was collected under the supervision of CFRI staff. The raw coal was crushed to 75 mm and screened at 50, 25, 13, 6, 3 and 0.5 mm. Sizewise float and sink tests were carried out and washability and Mayer's curves were plotted, The theoretical yield% at 16.9 ash level was 78.3% and the middlings yield was 10.3% at 46.5 ash level. The yield of rejects was 6.6% at of 81.9 ash level.

Based upon the theoretical data, options for different uses were suggested to the sponsor.

VALUE-ADDED PRODUCTS FROM VEGETABLE OIL AND USED MINERAL OIL (*CFRI, Dhanbad*)

Objective of the project was gainful utilisation of vegetable oil and used mineral oil for the preparation of value added products. In Jharkhand state, vegetable oil like castor oil, mahua oil and karanja oil, etc. are available in sizeable amount. Used mineral oil (transformer and turbine oil) is also generated as waste in power sector, steel industries and automobile sector. These waste oils are partly used in an unorganised way. Therefore still there is scope to create more consumption pattern aiming at value added products. As per the schedule, karanja oil (vegetable oil) and used transformer Oil (mineral oil) were considered as feedstock (based on availability) for making general purpose grease. Three different compositions were formulated. Grease was prepared in batches of 500g. Formulated products were tested with available infrastructure at CFRI and some of the basic properties of grease as lubricants have been explored.

INDUSTRIAL DEVELOPMENT PROGRAMME

CFRI participated in Industrial Development programme organized by Marwari Yuva Munch, Jharia on 4th April 2006 at ISM, Dhanbad. Dr Gora Ghosh, Shri H. B. Moitra and Dr Jahar Roy delivered lectures on various subjects focusing the role of CFRI in Industrial Development in Koylanchal area. CFRI had put its stall showing its various products/technologies developed. On this stall Dr Rajesh Kumar, Shri Goutam Goswami and Shri Anirudh Das were present to interact with the customers/delegates/visitors. Brochures, pamphlets, annual reports and booklets were also distributed to the visitors.



(CFRI Stall at ISM, Dhanbad on 04.04.06)

CFRI FOUNDATION DAY

CFRI Foundation Day was celebrated on 22nd April 2006. On this occasion Prof. O. N. Srivastava, Head, Department of Physics, Banaras Hindi University, Varanasi was the Chief Guest and delivered Foundation Day Lecture on "Prospect and Perspectives of Nanoscience and Technology". Dr. S. C. Roy, Acting Director, in his welcome address told that today's lecture is very important, as it is an emerging field of science. Dr. L. C. Ram introduced the speaker to the audience. Dr Abhijit Sarkar spotlighted on the achievements of CFRI in last 60 years of its existence. At the end Dr S. K. Srivastava proposed a vote of thanks.

NATIONAL TECHNOLOGY DAY

On 11th May 2006 National Technology Day was celebrated. On this occasion Prof. Gurdeep Singh, Head, Center for Mining Environment, Indian School of Mines, Dhanbad was the Chief Guest and delivered a lecture on "Environmental Impact of Mining". Dr S.C. Roy, Acting Director in his welcome address spoke

about the technology developed by CFRI on coal and related matters, which are widely accepted by industrialists of the country. Dr L.C. Ram, Scientist read out the biodata of Dr Gurdeep Singh. Dr S.K. Srivastava, Scientist proposed a vote of thanks.

ACTING DIRECTOR APPOINTED

Dr. S.K.Srivastava, senior most Scientist 'F' has taken over the charge of Acting Director, CFRI on 30.06.06 from the out going Acting Director, Dr. S.C. Roy. Dr Roy superannuated from his service w.e.f. 30.06.06.



(Dr. S.K. Srivastava shaking hand with Dr. S.C. Roy after taking over the charge of Acting Director from Dr. S.C. Roy on 30.06.06, Shri K.K. Dutta is also seen)

PAPER PUBLISHED

Journals

- 1.Reverse micro emulsion mediated sol-gel synthesis of lithium silicate nanoparticles under ambient conditions: Scope for CO₂ sequestration, R.B. Khomane, B.K. Sharma, S. Saha and B.D. Kulkarni, Chemical Engineering Science, Vol. 61, Issue 10, May 2006, 3415-3418.
2. Optimization process of bio-depolymerisation of lower rank Indian coals with reference to carbon and nitrogen sources, Selvi V.A, Ram.L.C, and Banerjee. R, Bio-sciences, Biotechnology Research Asia, Vol 03, No: 01a, 2006 (Accepted).
3. Leaching behavior of lignite fly ash with shake and column tests L.C. Ram, N.K. Srivastava, Ramesh C. Tripathi, Sanjay K. Thakur S.K. Jha and A.K. Sinha, Reginald E. Masto, Swapan Mitra, Environ Geol (available online 8 July 2006).
4. Changes in soil biological and biochemical characteristics in a long- term field trial on a sub tropical

inceptisol, R. E. Masto, P.K. Chhonkar, Dhyan Singh, A.K. Patra, Soil Biology & Biochemistry (In press).

Seminar

1. 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, International of Pittsburg Coal Conference, University of Pittsburgh School of Engineering, Technical Session 52, 24th-28th, September, 2006 (Accepted).
2. Eco-friendly bulk use of fly ash in agriculture and forestry L.C. Ram, S.K. Jha, A.K. Sinha, R. E. Masto, M.K. Singh, A. Selvi, Souvenir, World Environment Day on 5th June, Tata Steel Ltd, Jharia Collieries Ltd, Jamadoba, p. 1-13.
3. Coal Biotechnology: Role of chelators and metal ions in coal bio-depolymerisation process, Selvi V.A, Masto R.E, Ram. L.C, Banerjee. R., Srivastava. N.K and, Tripathi, R.C. (Accepted) National Seminar on "Current Trends in Biotechnological Application", Thiagrajan College, Madurai, Tamil Nadu, 20th –21st July 2006.

E-GOVERNANCE KICKS OFF

Days of slow moving have now gone. In CFRI also, to speed up the administrative work, e-governance was launched through CFRI intra-net on 09.05.2006. Scientist and other staff from NAL, Bangalore helped in the preparation of this plan in CFRI.

NEW INSTRUMENTS 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:

1. Ultrasonic Flow Meter for measuring flow rate of liquid/ water
2. Flue Gas Analyzer

NEW PROJECTS RECEIVED

1. Sampling and analysis of imported coal unload at Port ends MV NANOS, sponsored by Steel Authority of India Ltd., Kolkata of Rs. 3.96 Lakhs.
2. To study the percentage yield of cleans by single gravity cut at 1.70 specific gravity of 9 ROM coal samples collected by Maratha Cement Works, sponsored by Maratha Cement Works, Upper Wahi, Palcorepana, Chandrapura, of Rs. 1.70 Lakh.

TECHNOLOGY TRANSFERRED

1. MoU was signed for Design Know-how: Setting up a battery of improved Beehive Coke Oven (CFRI-Tata type) for manufacture of coke with M/s. Maherkiran

Enterprises Ltd., 494/A (Part) Raod 22, Jubilee Hills, Hyderabad-500033, A.P. on 17.05.2006.

DEPUTATION ABROAD

1. Dr. Sudip Maity, Scientist left for Poland w.e.f. from 04.06.06 to 01.09.06 to study the structurally modified Indian Coals under Bilateral Exchange Programme of Foreign Scientist of INSA, New Delhi.
2. Dr. Sunil Kumar Srivastava, Scientist and Dr. B.K. Sharma, Scientist visited Thermo Electron Corporation, 25, Nimbe Hill Road, Newington, USA during 26-28 June 2006 to take up pre-shipment demonstration of TGA-MS Unit.

PATENT INFORMATION ON COAL

1. US Patent No. 7,056,359, June 6, 2006

Title- Process for modifying coal so as to reduce sulfur emissions, *Inventor*- Somerville, et al.

Abstract- A method of manufacturing a coal product having reduced sulfur emissions including the steps of grinding coal into a powder form having a desired particle size; blending the ground coal with hydrated lime; adding water to the blend so as to have a moisture content of between 10 and 30 weight percent and drying the water-added blend so as to have a desired reduced moisture content. The desired reduced moisture content is less than 1% of the total weight of the coal powder and the hydrated lime. The step of drying includes heating the water-added blend to a temperature of between 300 and 400. degree F. in an externally heated oven. Waste heat from a power plant can be used so as to head the blend.

2. US Patent No. 7,066,728, June 27, 2006

Title-Process and apparatus for oxygen enrichment in fuel conveying gases, *Inventor*: Chatel-Pelage, et al.

Abstract-An improved process for burning solid fuel particles in a combustion chamber and creating a flue gas is disclosed. The method comprises creating a fuel gas stream by mixing the solid fuel particles with a conveying gas, transporting the fuel gas stream through a fuel duct terminating at the combustion chamber at a fuel exit plane and injecting an oxygen stream through an injection device into said fuel gas at an oxygen injection location selected to create a mixing zone to mix the oxygen stream and the fuel gas stream immediately prior to or coincident with combustion of

the fuel. Operating parameters of the process can be varied to optimally reduce NO_x emissions.

(Source-www.uspto.gov)

WORLD AROUND

INDIA SIGNS IRON ORE EXPORT DEALS

India, world's third-largest iron ore exporter, has signed new five year agreements with Japan and South Korea for ore exports, slashing the quantity to a maximum of 6.78 million ton (MT) annually during 2006-11. "The new long term agreements with Japan and Korea have been signed. Iron ore exports to these two countries during 2006-11 would be in the range of 2.70 MT to 6.78 MT". Mr Christy Fernandez, Additional Secretary in the Ministry of commerce, said here. The previous five- year agreement ended on 31 March.

(The Statesman, 28 June 2006)

INDIA TO ENTER GAS HYDRATE CLUB

Finding it difficult to meet energy requirements through domestic production and with sky rocketing crude oil prices hitting the economy, India is now making an entry into the "gas hydrate club". It has the capacity to meet country's energy requirements to a great extent.

So far, only two countries, the USA and Japan, have been undertaking research in exploration and production of gas hydrates. Other than these two countries, only India has had some success by establishing the presence of 420 feet thick good quality gas hydrate in the Krishna Godavari basin.

The discovery was made less than a month after the National Gas Hydrates Programme (NGHP) started drilling the KG basin utilising drill ship "Joides Resolution" through an agreement between the DGH (Director General of Hydrocarbons) and a "US Consortium".

Gas hydrates, whose scientific name is methane hydrate, is a low calorific gas found in solid form in the deep sea, at around 25 degree Celsius. Though it can be used for power generation, cooking fuel or other Industrial usage, it cannot be used as transportation fuel without improving its calorific value.

(The Statesman, 28 June 2006)

JHARKHAND OFFER TO MITTAL STEEL

The Jharkhand government has decided to offer adequate coal and iron ore to Mittal Steel for its proposed 12 million ton capacity Greenfield steel plant in the state. State Chief Secretary, Mr MK Mandal said that the Jharkhand government was processing all paper work for assuring the steel major, about its requirement of minerals and other raw materials. "The company had sought a Letter of Comfort from the state government about the availability

of iron ore for their proposed plant. We have discussed the issue in detail and the relevant state mines and the geology department is ready to offer the Letter of Comfort to Mittal Steel. However, the company should first come up with a proper site for their proposed project. There has been no communiqué from their part on this matter. Till then, the issuance of any sort of Letter of Comfort holds no ground" said Mr. Mandal.

According to information available, the proposed Mittal Steel project, once on the ground, would be needing around 600 million tons of iron ore to meet its need for the first 30 years of operation. Apart from that adequate supply of water, coal and transportation network would be vital pre-conditions for the company's maiden venture in the country.

Mittal Steel had signed a memorandum of understanding with the Jharkhand government for their proposed Greenfield steel plant with an estimated investment of \$8.6 billion. "We feel that the plant should come up in the Ranchi district itself, given its proximity to the railhead and other facilities. However, the company would be the final decision maker on this issue" said the Chief Secretary. Commenting on Mittal Steel's eagerness to take over the Chiria mines in West Singhbhum district on lease from the Jharkhand government, Mr Mandal said.

EVENTS AHEAD

1. Independence Day on 15 August 2006
2. CSIR Foundation Day on 26 September 2006

CFRI IN MEDIA

1. Nanoscience very important in present context: Prof. Srivastava (*Hindustan-01.04.06*)
2. CFRI's Role Pivotal in Industry Establishment (*Hindustan-05.04.06*)
3. Jharia King's son opposes merger of CFRI, CMRI (*Hindustan Times-12.04.06*)
4. Spring Festival celebrated at CFRI (*Dainik Jagran-29.04.06*).
5. CMRI+CFRI=CIMFR (*Hindustan-07.06.06*).

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