

Resume & Publications

of

Professor Nikkam Suresh

1. Names and Designation. : **Dr NIKKAM SURESH**
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 Dept. of Fuel & Mineral Engineering.
 Indian School of Mines University ,
 Dhanbad, **JHARKHAND – 826004**
 Telefax: 0326 2296626
 e-mail: snikkam2002@yahoo.com

2 Date of Birth. : 19th March 1959

3 Area of Specialization. : **Mineral Engineering**

4 Educational Qualification

Sl. No	Degree	Name Institute	Class	Year
1	M A Sc - Master of Applied Science in Mineral Processing	Gulbarga University, Gulbarga	First class & Distinction	1982
2	M Tech – Mineral Engineering	I S M -Dhanbad	First Class	1985
3	Ph D – Mineral Engineering	I S M -Dhanbad	NA	1992

6 Details of professional experience:

No.	Post	Organization	Duration
a.	Lecture	Indian School of Mines-Dhanbad	1987 to 1992
b.	Sr Leturer	Indian School of Mines-Dhanbad	1992 to 1997
c.	Assistant professor	Indian School of Mines-Dhanbad	1997 to 1998
d.	Foreign Fellowship	University of Karlsruhe-Germany	1998 to 1999
e.	Assistant professor	Indian School of Mines-Dhanbad	1999 to 2004
f.	Associate Professor	Indian School of Mines-Dhanbad	2004 to 2010
g.	Professor	Indian School of Mines-Dhanbad	2011 to till date

7. Achievements

a]	Coal Beneficiation award	[IIME]	2010
b]	National Mineral Award	[GOI, MoM]	2000
c]	Distinguished Teacher Award	[CVKEF]	2000
d]	DAAD Fellow	[Germany]	1997
e]	Dr R P Bhatnagar Award	[M G M I]	1996
f]	Certificate of Merit Award	[I E (India)]	1992

8. Research & Teaching

a).	Research experience [as a Research scholar]	05 Years
b).	Teaching experience	25 Years
c).	Research publications	60
d).	Research projects	10
e).	M Tech Thesis Guided	20
g).	Ph D Students [Awarded-3 & Registered-3]	06
f).	Training Programmes conducted	10

- 9 Member Editorial (Guest Editor): Trans IMM, London, [Sec – C] Mineral Proc. & Extractive Metall].
Tata Search, Tata steel, Jamshedpur, [in house journal]

Short Courses conducted (Under Executive Development Programme of ISMU)

<u>No.</u>	<u>Title of the course</u>	<u>Type</u>	<u>Year</u>	<u>Place</u>
a)	Mineral Beneficiation - principles Developments & Plant Practices	In-campus	1994	I S M
b)	Beneficiation & utilization of Iron Ore Fines.	In-campus	1995	I S M
c)	Mineral Dressing - Principles & Plant Practices.	Off-Campus Goa.	1996	FOMENTO-
d)	Beneficiation of Iron Ore Fines	In-campus	1997	I S M
e)	Mineral Beneficiation - Principles, Developments and Plant Practices	In-campus	1997	I S M
f)	Processing of Beach Placer Minerals	In-Campus	2001	I S M
g)	Coal/Mineral Beneficiation - Plant Practices	In-Campus	2003	I S M
h)	Application of Cyclones in Coal Mineral Industry	Off Campus	2006	Weirminerals Bangalore
i)	Coal Preparation– Principles & Practices	In-Campus	2007	ISMU
	Coal Preparation for Practicing Engineers Washery, Tatasteel, Ghatotand	Off-Campus	2008	W B Coal

<u>Laboratory Equipments/Test-rigs/Pilot Scale units Developed</u>

1. Indigenously designed a pilot scale level COLUMN FLOTATION test rig [75mm diameter and 4 meter height having 5 TPD capacity] in the laboratory mainly controlled by mechanical instrumentation for the beneficiation of carbonaceous materials like Graphite/coal.

2. Designed a Prototype Pilot Scale 50mm COLUMN FLOTATION Test Rig for washing of -0.50mm Coal fines with indigenously designed air sparger [50mm diameter and 3 meter height having 2 TPD capacity]
3. Designed a **spiral concentrator test-rig** in the laboratory to treat -0.50 mm **Indian coals**. [For LD-7 spiral of 1 t/hr capacity]
4. Designed laboratory model flotation cell (of **Denver type**) for accurate analysis of the kinetics of the flotation process with twin scraper system and adjustable height impeller.
5. Designed the following centrifugal separator test-rigs for the research and testing purposes:
 - 100mm and 75 mm **water-only cyclone** test-rings
 - 75mm and 100 mm **Dense Medium Cyclone** Testing Units
 - 75mm **Vorsyl test rigs** for cleaning -3.0 mm coals
 - A100mm **Hydrocyclone** unit for classification of coal & minerals.
6. Designed 500mm and 650mm size Industrial Model Cavex Dense Medium Cyclone (with ceramic lining) for washing of -15mm size coarse coals with M/s Weir Minerals India Pvt. Ltd.



Applied for International Patentship for INVOLUTE CYCLONE SEPARATORS, Jointly with M/s Weir Minerals Bearing No 2357/CHE/2009 dated 29.09.2009

LIST OF RESEARCH PUBLICATIONS

A INTERNATIONAL:

1. **Nikkam Suresh, M Vanangamudi and T C Rao.**
Effect of cone angle on the separation characteristics of compound Water-only cyclones, Minerals and Metallurgical processing, American Society of Mining Engineers, [SME/AIME], pp.130-137, Aug.1989.
2. **Nikkam Suresh, M Vanangamudi and T C Rao.**

- Water distribution in Water-only cyclones. Minerals Engineering. Vol. 3., No.5, pp.537-541, 1990.
3. **Nikkam Suresh, M Vanangamudi and T C Rao.**
Water-only Cyclones, American Mining Magazine, pp: 266-268, April 1990
 4. **Nikkam Suresh and N R Mandre.**
Kinetics of Chalcopyrite dissolution using Ferric Chloride, International Symposium on Mineral Beneficiation, Held at IBM-Nagpur, 1994.
 5. **Nikkam Suresh, N R Mandre, Rita Banik and A S Venkatesh.**
Selective flocculation of Lead-Zinc-Copper sulfides of fines of Rangpo-Sikkim area, International Symposium on Mineral Beneficiation, Held at IBM-Nagpur, 1994.
 6. **Nikkam Suresh, R Venugopal and T C Rao.**

Prediction of performance of 76 mm Compound Autogenous Cyclone at different out-let diameters, Trans. IMM [LONDON], Sec.-C, Vol.104, C1-50, pp. C30-C36, Jan-April 1995.
 7. **Rita Banik, Nikkam Suresh and N R Mandre.**

Selective flocculation as a pre-concentration process-an overview, Mineral Processing and Extractive Metallurgy Review [Amsterdam], Vol.14, pp.169-177, 1995.
 8. **Nikkam Suresh, M Vanangamudi and T C Rao.**
A performance model for water-only gravity separators treating coal, Fuel [Elsievier publishers-London], Vol.75, No.7, pp. 851-854,1996.
 9. **Nikkam Suresh, M Ruland & W H Stahl**
Mechanische Eigenschaften Von Filterkuchen, "Chemie Engg. Der Uni Karlsruhe", 17 July1999.
 10. **Nikkam Suresh, D Thripathi and A S Venkatesh,**
Characterization and Beneficiation of Boula-Nuasahi chromites, Paper present in an International Conference on Challenges and Trends in Coal Mineral Beneficiation [ICCAMB-2001]; Indian School of Mines-Dhanbad, 8-9 December 2001.
 11. **Nkkam Suresh and R Venugopal**
Particle Size Effects in Batch Limestone Flotation, Paper presented in an International Conference on Mineral Processing Technology - 2002, held at Indian Institute of Science - Bangalore, 3-5 January 2002.
 12. **M M Konar, Nikkam Suresh& R Venugopal.**

Importance of characterization in Development of beneficiation strategy - A case study of beneficiation of Limestone to SMS, MPT-2003, Goa, India Feb 2003,

- 13 Dr Nikkam Suresh and Vinay Kumar**
Computer Aided Design & Simulation of Comminution Circuits, Paper communicated to International conference on Mineral Processing Technology [MPT-2004], RRL-Bhubaneswar, Jan-2004.
- 14. Surabhi, Nikkam Suresh & G Udayabhanu**
Methodologies for Recovery of Carbonaceous Material from Coal Combustion Byproducts in India, Jr. Powder Handling and Processing, Vol.16. No.3, Trans Tech Publisher Paper, Germany May/June 2004.
- 15 Shivakumar I Angadi, Nikkam Suresh, Sandeep Mondal and R Venugopal**
Textural Image Analysis of Batch Coal Flotation Froths, Proceedings of the international Conference on Mineral Processing Technology - 2005, [MPT-2005] Held at ISM-Dhanbad, 2005.
- 16 Niharika Charan & Nikkam Suresh**
Studies on Beneficiation of Karaikal Beach Sands Using Mozley Mineral Separator, Proceedings of the international Conference on Mineral Processing Technology - 2005, Held at ISM- Dhanbad, MPT-2005
- 17 Surabhi, G Udayabhanu & Nikkam Suresh**
Recovery of Carbonaceous Material From Bokaro Thermal Power Plant Fly Ash (BTPP) By Froth Flotation, Proceedings of the international Conference on Mineral Processing Technology - 2005, Held at ISM- Dhanbad, Jan -2005
- 18 Shivakumar I Angadi & Nikkam Suresh**
Kinetic model for the prediction of water reporting to the froth products in batch flotation International Journal of Mineral Processing and Extractive Metallurgy , Trans institution of Mining and Metallurgy, Sec C, Vol. 114, 2005.
- 19 Nikkam Suresh & T C Rao,**
Recent Developments In Ore Beneficiation Techniques, Underground Metal Mining: Status and Prospects {UMMSP-2006}, February 13-14, 2006.
- 20 Surabhi, Nikkam Suresh and G Udaibhanu**
Characterisation of unburnt Carbon Recovered from Fly Ash by Froth Flotation, International Conference on Mineral Processing Technology [MPT-2006], Held during March 8-10, National Metallurgical Laboratory, Chennai, pp: 128-133, 2006
- 21 Nikkam Suresh, T Gouricharan, T S Banerjee, S J Gopalkrishna & D D Haldar,**
Influence of some Design & Operating Variables of Autogenous Cyclone on Coal Washing Performance', International Conference on Mineral Processing Technology [MPT-2006], Held during 8-10 March, CHENNAI, pp:582-592, 2006.
- 22 Surabhi, Nikkam Suresh and G Udaibhanu**

Recovery of carbonaceous material from fly ash using different methods, International Conference on Mineral Processing Technology [MPT-2006], Held during 8-10 March, CHENNAI, MPT-2006

- 23 P. Raghavan, S. Chandrasekhar, V. Vogt, E. Gock, and N. Suresh**
Additional investigations on the Separation of Titaniferrous Impurities from Kaolin by High Shear Pre-treatment and Froth Flotation-Part I, Applied Clay Science, Vol. 38, Issue 1-2, pp 33-42, Dec.2007.
- 24 Nikkam Suresh*, Senthil Kumar* and P K Banerjee**
Characterization And Beneficiation Of Low Indian Iron-Ore Fines, Jr of Aus IMM, Special issue on Iron Ore Beneficiation, 2007
- 25 Nikkam Suresh and Shivakumar I Angadi**
Characterizations of Flotation Froths by Textural Image Analysis in Batch Coal Flotation operation, MPT-2007, IIT-Powai, Mumbai, 2007.
- 26 P Raghavan, Sathy Chandrasekhar, S Ramaswamy and Nikkam Suresh,** Value addition of China Clay by the Removal of Titaniferrous Minerals, MPT-2007, IIT-Powai, Mumbai, 2007.
- 27 P Raghavan, S. Chandrasekhar, V. Vogt, E. Gock and N. Suresh**
Additional Investigations on the Separation of Titaniferrous Impurities from Kaolin by High Shear Pre-treatment and Froth Flotation – Part II, Journal of Applied Clay Science Vol. 42, Issue 1-2, pp 50-56, Dec.2008
- 28 T Kumar and Nikkam Suresh**
Production of Coal Bed Methane in India - Its Prospects and Important Environmental Issues, 2008 Workshop on CBM & CMM, Held by total CBM solutions, During 10th March 2008 at PHD House, New Delhi, 2008
- 29 P Raghavan, Nikkam Suresh and Sathy Chandrasekhar**
Beneficiation of Mamuara clay with special reference to froth flotation, Paper communicated to MPT-2008, RRL-Trivendrum, 2008
- 30 K Kalyani, T Gauricharan, D D Haldar, Amalendu Sinah and Nikkam Suresh**
Coal-Fine Beneficiation Studies of a Bench-Scale Water-only Cyclone Using Artificial Neural Network” International Journal of Coal Preparation and Utilization, Volume 28, Issue 2, April 2008, Pages: 94-114, 2008
- 31 Nikkam Suresh, Rachit Tiwari, Piyush Raghav, R K Dwari* & S I Angadi**
Comparison of Hydrocyclone Performance Using Different Mathematical Models, International Conference on Mineral Processing Technology-2009, IMMT, Bhubaneswar, 2009.
- 32 P Raghavan, Savithri S, and Nikkam Suresh**
Analysis Of Pre-treatment Effects for the Removal of Titaniferrous Impurities From China Clay by froth flotation " Proceedings of 14th International Clay Conference, 14-20, June 2009, Castellaneta Marina, Italy, 2009

- 33 A Anupam, G singh, P K Raghav, N. Suresh**
Studies on beneficiation of BHQ samples by different methods presentation in MPT-2010, International Conference on Mineral Processing Technology, IIME-Jamshedpur, 15-17, December 2010
- 34 Shalini Gautam, Rama Shankar Yadav and Nikkam Suresh**
Evaluation of the Characteristics of as Received and Washed Low Grade Indian Coals for their Industrial Applications, Journal of Energy Resources, Part A: Recovery, Utilization and Environmental Effects, 2010.
- B NATIONAL:**
- 35. Nikkam Suresh and P Bandopadhyay**
Separation behaviour of coarse and fine fractions in 100 mm Water-only Cyclone treating coal, Jr. of Minetech, Vol.17, No2-3, pp.34-39, Mar-Jun 1996.
- 36. Nikkam Suresh, M Vanangamudi and T C Rao**
Mathematical representation of performances of coal cleaning units, Jr of Institution of Engineers [India], Vol.72, pp.58-63, Nov.1992
- 37. D D Haldar, Nikkam Suresh, and T C Rao.**
Effects of some process variables of conditioning on the coal-oil agglomeration of middlings, Institution of Engineers [India], Vol.76, May 1985.
- 38. Nikkam Suresh and S Gunasekharan**
Scientific temper in Indian Educational Institutes-a Nehruvian Perspective, volume on 'SCIENTIFIC TEMPER' [Ed. by S Gunasekaran], 1986.
- 39. Nikkam Suresh, Shashi Bhushan, M Vanangamudi and T C Rao.**
Effect of outlet diameters on the performance of 76 mm Water-only Cyclone, Trans. IIM (India), Dec 1984
- 40. Nikkam Suresh, R Venugopal and T C Rao.**
Flotation Characteristics of Limestone fines, National Seminar on Fine Particle Processing, Held at ISM-Dhanbad, 1986.
- 41. Nikkam Suresh, M Vanangamudi and T C Rao.**
A simple mathematical model to represent the performance of coal cleaning gravity separators, National Seminar on Recent Developments in Mineral Processing, Held at Jamshedpur, April 1990.
- 42. Nikkam Suresh, T Gouricharan and D D Haldar.**
Beneficiation of Talchir Classified coal fines by froth flotation - a mathematical approach, CHEMINAR-92, Held at RRL-Bhubaneswar, 1992.
- 43. Nikkam Suresh and T C Rao,**
Applications of water-only cyclones for the beneficiation of coal and minerals, Jr of Mines, Metals and Fuels, P: 392-397, October 2001.
- 44 Nikkam Suresh, Prem Kumar and R Venugopal**
Technological Innovations in Processing of Beach Placer Minerals, National Seminar on Placer Mineral Separation, Organized by Deptt of Ocean Development, Held at Kanyakumari, 25-26 August, 2001.

- 45 Nikkam Suresh, D Tripathi and A S Venkatesh,**
Characterization and Beneficiation of Boula-nuasahi chromites, International conference on Coal & Mineral Beneficiation, ICCAMB-2001, held during 7-8th December, 2001, at Indian School of Mines – Dhanbad, 2001.
- 46 Dr Nikkam Suresh and Shivakumar I Angadi**
Recent developments in processing of beach placer minerals, IV convention of Mineralogical Society of India & National Seminar on Geology, Processing and Metallurgy of Economic Minerals, GEOPEPMEM 2001, held at P G Centre, Nandihalli, Sandur (Gulbarga University) Jointly organised by Dept of Earth Sciences, P G Centre, Nandihalli and Mineralogical Society of India, Deptt of Geology, Mysore University, Mysore, During 20-21st December 2001.
- 47 Nikkam Suresh & T C Rao**
Application of water-only cyclones in coal and mineral beneficiation plants, National Seminar on Engineer Applications of Hydrocyclones, Organised by Journal of Mines, Metals and Fuels, October 2001. .
- 48. Nikkam Suresh**
A numerical approach for accurate estimation of yield of products in coal washing plants, National Seminar on Mathematical, Statistical and Computational Methods in Science and Technology, November 29-30, 2001, ISM-Dhanbad, 2001.
- 49. Nikkam Suresh, Tushar Sinha and C S Pant.**
Use of computer animation in Mineral Beneficiation Plants, International Conference on Quantitative Approaches in Mineral Processing-2003, QAMP-03, Held at RRL - Bhubaneswar. 3-4, July, 2003.
- 50 Shivakumar I Angadi and Nikkam Suresh.**
Physical Separation Methods In Minerals Processing. National Conference on Emerging Areas in Applied Physics scheduled to be held during February 2004, at ISM, 2004.
- 51 Nikkam Suresh**
Beach Placer Minerals - Their Formation & Beneficiation, Seminar Paper presented on World Environment day - On the topic “Wanted – Seas & Oceans: Dead or Alive” on 5th June, 2004, Organised by Institution of Engineers India, Dhanbad, 2004.
- 52 S I Angadi & Nikkam Suresh**
Kinetic and Entrainment Studies in Batch Coal Flotation, The Jr. of Institution of Engineers India, Vol. 85, Aug.2004
- 53. Surabhi, Nikkam Suresh & G Udayabhanu**
Removal of carbonaceous material from fly ash, National Conference on Emerging Areas in Applied Physics, held at ISM, during February 2004.
- 54. Shivakumar I Angadi and Nikkam Suresh**
A Kinetic Model for the Prediction of Water Flowrate to the Froth Product In Batch Flotation of West Bokaro Coal Fines. Institution of Engineers (India) Vol.85, August 2004.

55 Kalyani, Pallavika, T Gourichanran, D D Haldar and Nikkam Suresh.

Optimization of a Bench-Scale Water-only Cyclone Using Response Surface Methodology, Paper being presented in a seminar on ‘Advances in Mining Techniques and Management’ being held at IIT, Kharagpur during 30th Nov. to 1st Dec.2005.

56 Nikkam Suresh

Influence of Some Design & Operating Variables of Autogenous Cyclone on Coal Washing Performance, National Seminar on GTFM-ISM, 2006.

57 Nikkam Suresh

Use Of Cyclones In Ferrous Industry ”presented in a In-House workshop on Trends and Problems in Beneficiation of Ferrous Ores, Organised at Sukinda Chromite Mines, Tatasteel, Sukinda Project, 2007.

58 Ranjita Swain and R. Bhima Rao and Nikkam Suresh

Effect Of Screen Deck Angle On Recovery Of Value Added Materials From Partially Laterised Khondalite Rocks, Institution of Engineers (India), Orissa State Centre, 2009

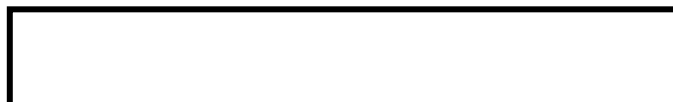
59 Nikkam Suresh,

Criteria for Flowsheet Design and Layout Preparation in Primary Crushing Operations, National Seminar on Beneficiation of Indian Minerals-Practices & Trends [BENCON-2010] on 16-17 July 2010, Held at SDS Autonomous College, Garividi, Vizainagaram, 2010

<p><u>List of MTech Theses Guided</u></p>
--

- 1. Performance Evaluation of 76 mm Water-only Cyclone Treating Coal,**
By Mr Mahendra Prasad, 1991.
- 2. Analysis of Performance of Mozley Mineral Separator to Wash Coal Fines,**
by Mr Krishna Kishore, 1993.
- 3. Studies on Dense Medium Cyclone (76 mm) to Clean –3.0 mm Coal Fines,**
By Mr Shivaji Pathak, 1994.
- 4. Characterisation of Coal Cleaning Vorsyl,**
By Mr R C Prakash, 1994.
- 5. Studies on Effect of Some Design and Operating Parameters of Water-only Cyclone for Beneficiation of Coals Crushed to 3.0 mm,**
By Mr T Gourichanran, 1995.
- 6. Ore Mineralogical Characterisation of Chromite and Sulphides from Boula-Nuashi area, Orissa, with Special Emphasis on Chromite Beneficiation,**
By Mr D Tripathy, 1996.

7. **Performance Analysis of Industrial Rake Classifier in Grinding Circuit of TPSB Copper Concentrator, Hindustan Copper Limited, ICC-Rakha.**
By Mr A Kumara Swamy, 1997.
8. **Processing of Noamundi Iron Ore Fines,**
By Mr Ritesh Kumar Naveen, 1999.
9. **Coal Washing Characteristics of 76 mm Vorsyl Separator,**
By Mr Himanshu Shekhar, 2001
10. **Coal Washing Efficiency of 76 mm Dense Medium Cyclone**
By Shri Rajeev Ranjan Singh, 2001
11. **Performance Studies on Stub Cyclones Operated With Dense Medium.**
By Mr Kunda Perra Reddy, 2004
12. **Separation Behaviour of Individual Size Fractions in Perm-Roll Magnetic Separator using Beach Placer Sands,**
By Anil Kumar Mishra, 2005
13. **Processing of Low Grade Iron Ore Fines**
By Shri Senthil Kumar, 2007
14. **Beneficiation of BHQ samples for reduction of Alumina to Silica ratio**
By Shri Ravindra Kissan, 2008
15. **Performance of Industrial Stub Cyclone Treating Low Grade Iron Ore Fines (BHQ)**
By Shri Suresh Paila, 2009
16. **Recovery of coal values from Flotation Tailings of Jamadoba Washery [Tatasteel, Jamadobad, Dhanbad]**
By Shri Himanshu Sharma, 2009
17. **Performance Analysis of Coal Washing Plant West Bokaro Coal Washeries of Tatasteel, Ghato Tand, West Bokaro.**
By shri Prashant Dixit, 2009
18. **Performance Analysis of Involute Dense Media Cyclone Separator for Washing of Coal Fines (-3.0 +0.50mm)**
By Shri Ankur Chauhan, 2010
19. **Application of Stub Cyclone to Beneficiate Low Grade Iron Ore Fines (-0.50mm)**
Shri Vivekanad Jaiswal, 2010
20. **Classification characteristic of Media Solids Involute Cyclone Separator During Washing of Coal Fines. 10**
By Shri Sandeep Singh, 2010



List of Consultancy Projects

- 1 Beneficiation off Limestone From Bundi Area, Rajasthan, (work carried out for Cement Corporation of India).

This work has identified the dry beneficiation potential for four Limestone samples for their use in cement industry.
2. Flotation Studies on Coal Fines. (Work carried out for WELMAN & WECOMA)

This investigation has helped in estimating the optimum dosage levels of the reagents in the flotation of coal fines.
- 3 Load and Performance Testing of Mahuda Coal Washery, (Work carried out for BCCL, Dhanbad)

This work involved performance testing of various operating units of the newly commissioned Mahuda Washery.
- 4 Improvement of Performance of Fine Coal Washing Circuit of Moonidih Coal Washery, (Work carried for BCCL, Dhanbad)

This work involved analysis of influence of operating parameters of hydrocyclones treating –0.50 mm coal fines for their optimum performance.
- 5 Flotation Characteristics of Bhelatand, Malkera and Sijua Coal Fines, (Work carried out for TISCO, Dhanbad)

This work was aimed to identify the beneficiation potential of Bhelatand, Sijua and Malkera colliery coal fines by Froth Flotation technique.
- 6 Studies on Characterization and Beneficiation of Dolomitic Limestone from Nandini Mines, Bhilai, (Work Carried out for SAIL R&D, Ranchi)

Dolomitic Limestone from Nandini Mine was subjected to characterization studies, which indicated a finer liberation mesh size. The kinetic studies carried out indicated that the flotation to follow First Order kinetic equation. The rate constant values estimated have helped in optimizing the levels of the reagents.
- 7 Improvement on the Performance of Coal Cleaning Circuit at Dugda-II Coal Washery, (Work carried out for CCWO)

This work involved the study of design and operating parameters of heavy medium cyclones for their optimum performance.
8. Application of W.O Cyclones for Beneficiation of Iron Ore Fines. (Work Carried out for M/S FOMENTO, Goa)

Experiments were carried out to beneficiate the Iron Ore Fines using Water-only Cyclones. About 2-3 percent improvement in the Fe and 3 to 5 percent reduction in Silica content could be achieved from the experiments.
- 9 Feasibility Studies on application of Water-only Cyclones to beneficiate –1.0 mm Coal fines at Sudamdih Coal Washery (Work carried out for BCCL, Dhanbad).

- Elaborate tests were conducted by changing all design and operating parameters of 76mm water-only cyclone using –1.0 mm Sudamdih coal fines. This study clearly indicated that there exists an avenue to replace the existing froth flotation circuit by water-only cyclone.
- 10 Minimization of Excess Froth Formation in Thickener Overflow of Dugda-II Coal Washery. (Work carried out for CCWO, Dhanbad).

Experiments were performed both at the Laboratory and Plant level to reduce the formation of excess froth in thickener overflow of Dugda-II washery, by controlling the reagent levels at the flotation circuit and addition of flocculants.
 - 11 Feasibility studies on Application of Freevis Products for Heavy Media Separation of coal (Work carried out for NACLO-Chem, Caluctta)

Tests were performed to identify the effect of viscosity of media and improve the washing efficiency of heavy media cyclone treating -3.0mm coal.
 - 12 Grade classification of Block-II area (BCCL - Dhanbad) coal seams for commercial utilization (BCCL-Dhanbad)

Aimed to categorize the coal seams of Benidih, Jamunia and Nadakurki coal mines to classify them on the basis of proximate analysis coking properties to improve their commercial value.
 - 13 Grading of Shatabdi Open Cast coal mine seam samples (Work carried out for BCCL, Dhanbad)

To arrive at an optimum blending ratio and maximize the mine production rate through systematic mine sampling/proximate analysis and make the coal suitable for Thermal Power Plants
 - 14 Studies on improvement of performance of Dense Medium Circuit at Bhelatand Coal Washery

Work carried out for Tatasteel, for TISCO Group of collieries, TISCO, Bhelatand – DHANBAD to reduce the ash content to 13% for the clean coal from existing ash of washed product of 16%.
 - 15 Characterisation and beneficiation of low-grade BHQ samples of Hospet-Bellary schist belt.

Work carried out for **M/S V S L mining co**, Sandur, Karnataka, to reduce the Alumina Silica ratio to the acceptable limit of <2.0% by different gravity separation techniques followed by column flotation after its thorough characterisation
 - 16 Material Balancing at Washery I and II of Tatasteel, Ghatotand, West Bokaro
Work performed for M/s Tatasteel, Ghatotand at the plant
 - 17 Material Balancing at Jamadoba and Bhelatand Coal Washeries of Tatasteel, Jharia Goup of Division, Jharia.

- 18 Washability analysis of Medium cooking and LVMC coals of BCCL, Central Coal Supplies Organisation, SAIL, Dhanbad.
- 19 Control of washed coal quality supplied to SAIL Steel Plants BCCL and CCL Washeries of Coal India Ltd, Central Coal Supplies Organisation, SAIL, Dhanbad

T H E E N D