Realtime Measurement of Bath Parameters for Aluminium Electrolysis Cells (RMBPA)
Developed at JNARDDC

Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur

www.jnarddc.gov.in
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JNARDDC has developed unique equipment capable of simultaneous measurement of vital aluminium electrolysis bath parameters which help in improved energy and current efficiencies that ultimately leads to enhanced cell performance. Measurement time is around 5 minutes and all bath parameters are instantly available which otherwise are measured separately and requires long duration.

This instrument provides following bath parameters in a single measurement

- **Operating temperature**
- **Superheat Temperature**
- **% Free Alumina**
- **Liquidus Temperature**
- **% Excess AlF$_3$**
- **Bath Ratio/Cryolite Ratio**

![ALUMINIUM ELECTROLYSIS BATH PROPERTIES](image)

**Features:**
- Wi-Fi enabled high speed data acquisition system
- Electromagnetic compatible tough pad with docking station (Dual RF)
- A probe with thermocouple arrangement
जवाहरलाल नेह एयमु ीिनयम अनुभव अस्तित्व अनसु ंधान वकास एवं अिभकप क नागपरु  के अध- वाषक  शोध पका के इस संकरण म हमारे सभी पाठक, शभु िचंतक और संरको का हादक वागत है। आने वाले वष म वै क एयमु ीिनयम बाज़ार क वृ  परवहन उोग, एयमु ीिनयम विनमाण  ौोिगकय और संकरण के उपकरण म तकनीक गित, विभन उोग म एयमु ीिनयम के उपयोग जसै े इमारत िनमाण , एयमु ीिनयम फॉयल तथा पकै ेजंग से संचािलत होगी ।

बैठक एयमु ीिनयम के मांग को देखते हए ऑटोमोबाइल े क बढ़ती भिू मकाओ ं से टल के ितथापन के िलए वै क एयमु ीिनयम क मांग एक सरल वकप के प म होगी । ऑटोमोटव और एयरपेस े क तेजी से मखु  बाजार म एयमु ीिनयम क मांग का समथन  बढेगा, यक यह टल के ितथापन के िलए एक पयाव रणीय प से बेहतर वकप है। बड़े पमै ाने पर शहरकरण, शहर े म रहने वाले लोग क आय म वृ  और तेजी से औोिगक वकास के कारण एिशया-पेिसफक वकास के मामले म अणीय े है। साथ ह साथ परवहन उोग म िनरंतर गित, अिधक भावी अिभनव और सते एयमु ीिनयम उपाद को वकिसत करने के िलए शोध क गितविधयां चल रह ह, जो बाजार के विकास को बढ़ावा देगी।

हालांकि, अन्य विकल्पों से बढ़ती प्रतिस्पष्ट और करदे माल जैसे एलिु मना क कमत म उतार-चढ़ाव ये तव बाजार के विकास को निशित करते हैं। चीन और भारत जैसी उभरती अर्थवथाओ ं क मांग वृ  और वै क तर पर पनु नव ीनीकरण एयमु ीिनयम उपाद के उपयोग म वृ  से एयमु ीिनयम बाजार के विकास के िलए लाभद अवसर िमलते ह।

Greetings to all our readers, well-wishers and patrons with warm welcome to this year's edition of the Jawaharlal Nehru Aluminium Research Development & Design Centre newsletter. In coming years the growth of the global aluminium market will be driven by development in the transport industry, technological advancements in aluminium manufacturing technologies & processing equipment, increase in usage of aluminium in various industries such as building & construction and foil & packaging.

The global aluminium demand outlook will benefit from growing roles in autos as a lightweight substitute for steel. The automotive and aerospace sectors will increasingly support aluminium demand in key markets, as an environmentally preferable alternative to steel. Asia-Pacific is the leading region, in terms of growth, due to massive urbanization, growth in income of people living in urban areas, and rapid industrial development. In addition, continuous advancements in transport industry and ongoing R&D activities to develop innovative, more effective, and cheaper aluminium products will fuel the growth of the market.

However, increase in competition from substitutes and fluctuations in prices of raw materials such as alumina are some factors that limit the market growth. Growth in demand from emerging economies such as China & India and increase in use of recycled aluminium products globally provides lucrative opportunities for the market expansion. Lowering energy requirement is one of the major challenges faced by aluminium industry.

Adding to eventful days of JNARDDC, scientists at Centre have completed a high value prestigious project with Vedanta on bauxite technological studies in record time. Institute also successfully designed and sold highly cost effective online bath parameters measurement equipment for aluminium smelter. During this part of financial year, Centre has completed some important projects on red mud utilization, status report on red mud, downstream applications of strip cast aluminium alloys etc. Centre was instrumental in formulating recommendations for Bureau of Indian Standards (BIS) regarding setting up standards for aluminium scrap under the aegis of Bureau of Indian Standard (BIS). Centre is in last stage of extrusion press commissioning to support the aluminium extrusion industry. Institute has completed strategy paper on resource efficiency of aluminium under aegis of NITI Aayog / Ministry of mines.

I invite & welcome you all to JNARDDC with a request to get associated with the Centre for extracting the maximum R&D benefits out of facilities & expertise available with us.

Jai Hind!
NITI Aayog in association with Ministry of Environment, Forest and Climate Change and the European Union Delegation to India unveiled “Status Paper on Resource Efficiency & Circular Economy” on 22nd January, 2019. During this event, four Sectoral Strategy Papers on “Resource Efficiency on Steel, Aluminium, Construction & Demolition Waste, Secondary Materials Management in Electrical & Electronics Sector” were also released by Mr Ratan P Watal, Principal Adviser, NITI Aayog and Member Secretary, EAC to PM and Mr Tomasz Kozlowski, Ambassador, European Union Delegation to India.

JNARDDC is proud to announce that one of the four sectoral strategy papers titled “Resource Efficiency in Aluminium” was compiled by JNARDDC and the same was presented by Dr Anupam Agnihotri during the event. JNARDDC in association with Ministry of Mines and NITI Aayog and with the support of AAI/MRAI is initiating training and awareness programmes on resource efficiency in aluminium shortly.

Mr S K Singh, Head - Melting & Casting and Mr Tapas Mukherjee, Head QA from BANCO Aluminium Ltd., Gujarat visited Centre on 22nd January, 2019 to explore the possibility of collaboration for improving their processes and products (billets and extruded profiles of aluminium alloys). Extensive discussions were held on addressing the quality problems faced by BANCO. They also showed keen interest in sending their personnel for training in downstream division.

BANCO Aluminium Team at JNARDDC

BANCO Team in Discussion with JNARDDC Scientists
Dr George Banvolgyi, a Senior Process Consultant (Ex- ALUTERV-FKI), Hungary visited JNARDDC on 4th February, 2019. He had a close look at the facilities of Centre and also presented his work on “Importance of analytical processes, some minor and trace elements in the Bayer process and Improved Low Temperature digestion (ILTD) process for reducing caustic soda consumption in the digestion process.”. He was highly impressed by the facilities and the work carried out by Scientists of the Centre. He motivated JNARDDC Scientists by sharing his expertise on the organic extraction and estimation during digestion.

Visit to Gravita India Ltd.

Dr Mohamed Najar, Principal Scientist, JNARDDC visited Gravita, Jaipur (a lead battery recycling plant) on 14th February, 2019 to discuss about in-house trial work done on the possibilities of safe disposal of slag generated during lead smelting. The details of research carried out at JNARDDC on geopolymerization of lead smelting slag for product development and immobilization of lead as well as other toxic components were discussed. Gravita expressed its interest to expand the area of research activities and conveyed their consent for further exploration of other rejects generated at their recycling plants.
HINDALCO Hirakud Smelter Team at JNARDDC

Team of engineers from HINDALCO, Hirakud, Odisha visited JNARDDC during January, 2019 to discuss in detail, the proposal submitted by JNARDDC for setting up of 5 TPD capacity 1st cut Spent Pot Lining treatment plant at Hirakud which includes providing process know-how, plant equipment, erection, commissioning and plant demonstration.

Meeting on Joint S&T Project with Christ University

Team from Christ University, Bangalore (Dr Gurumoorthy Hebbar, Dr Parvati Ramaswamy, Mr Gowtham Sanjai) visited JNARDDC on 28-29th January, 2019 for the detailed discussion on the progress of ongoing MoM sponsored collaborative project entitled “Fabrication of Advanced Ceramic Nanocoatings for Automotive Applications”. It was decided that Christ officials will work to collect the substrate materials from different automobile industries and hand over to JNARDDC for further deposition of wear resistant coating applications. Officials also outlined the future plan of action.
JNARDDC was invited for the first time to participate in Central Geological Programming Board (CGPB) Meeting which was held on 15th February, 2019 at the NASC Complex, Indian Council of Agriculture Research, New Delhi. CGPB primarily coordinate activities on geological mapping and mineral prospecting, exploration and exploitation in the country with GSI as nodal department. Representatives of State Departments, Central Ministries / Organizations, PSUs, academic institutes and private entrepreneurs attended this meeting. Hon'ble Union Minister of State for Mines Shri Haribhai Parthibhai Chaudhary who was the Chief Guest for the inaugural function in his address stressed the need for optimum utilization of the available mineral resources in the country and mentioned that the Union Government has taken several steps and also devised the new National Mineral Policy with a view to promote the ease of doing business along with ensuring the participation of the private sector for better mineral exploration. The Minister also inaugurated an exhibition displaying the status of “Mineral Exploration in India” and was apprised about activities, capabilities and achievements of JNARDDC during his visit to JNARDDC display stall.

The CGPB meeting was held under the chairmanship of Shri Anil Mukim, Secretary to the Govt of India, Ministry of Mines (MoM) Dr K Rajeswara Rao, Additional Secretary, MoM, Dr Dinesh Gupta, Director General, Geological Survey of India (GSI), Shri R S Garkhal, Additional Director General, GSI, Shri Bipul Pathak, Joint Secretary, MoM were the other dignitaries to grace the meeting of the Board. During the occasion seven publications were released, twenty mineral exploration reports were handed over to seven state governments and the proposed Annual Programme for ensuing 2019-20 was presented before all Board members. CGPB platform was perfect forum for JNARDDC for interacting with representatives from different organisations (associated with mineral and mining sector) and exploring possibilities of meeting their analytical needs and meaningful business.
Training Programme for Non-executives from NALCO

Training programme on “Aluminium Technology” for three batches of NALCO non-executives was successfully conducted at JNARDDC during February 2019. Total thirty one operators who attended the training programme were thoroughly enlightened in the areas of aluminium electrolysis (bath composition, factors affecting energy consumption/energy efficiency, anodes-cathodes etc) and also cast house technology. The trainees expressed that theoretical knowledge gained will certainly help in discharging their duties more efficiently leading to improved productivity & quality.

JNARDDC Officials Visited Sunalco, Mumbai

As a part of ongoing project on “Techno-economic Survey of Aluminium Scrap Recycling in India”, Dr Anupam Agnihotri along with Mr R N Chouhan visited Sunalco Industries Pvt. Ltd., Mumbai, on 18th March, 2019. Sunalco being one of the major aluminium recycling units in the country has very impressive set up and following exemplary practices to eliminate all discharges to land i.e zero waste concept. Mr Sandeep Jain, Director Sunalco explained the details of practices followed and also put forth the difficulties faced by the industry.
Visit to CFEES, DRDO

Team of Scientists from JNARDDC and VNIT Nagpur led by Dr Anupam Agnihotri, visited Centre for Fire, Explosive & Environment Safety (CFEES) of DRDO, New Delhi on 12th April, 2019 to explore the possibility of developing light weight materials for Indian Army. A detailed discussion was held on the light weight materials and structural panels developed from industrial rejects at JNARDDC and VNIT laboratories. Dr Anil Kumar Agarwal, Director ER & IPR and the technical team suggested to develop much stringent and stronger materials to withstand adverse conditions.

Visit to Star Trace

Dr Anupam Agnihotri and Dr Upendra Singh visited pilot scale facility for manufacturing magnetic and vibratory equipment for engineering industry at Star Trace Pvt Ltd, Chennai during 16-18th May, 2019. They interacted with Mr P Maheswaran (CEO-Star Trace Pvt Ltd) and discussed about various beneficiation techniques for the extraction of valuable metals from red mud. As a part of ongoing project on extraction of rare earth elements from red mud, JNARDDC officials handed over 10 kg of sample to Star Trace for feasibility studies of physical beneficiation using magnetic, spiral and gravity separators.

JNARDDC-TAL Meet

A team of scientists led by the Director, JNARDDC, called on one of the leading manufacturers of aerospace structures viz. TAL manufacturing solutions Ltd., Nagpur on 23rd May 2019. During the meeting, Mr Rajeev Kapoor (Senior General Manager, Operations) and his group presented some key areas where the expertise of JNARDDC has been sought. Following the discussion, a project team from both the organizations were appointed to collaborate for addressing the issues related to residual stress, developing chemical testing facilities and softwares for machining strategies and aluminium forming. JNARDDC team is now actively exploring the possible solutions.
A team of Scientists from JNARDDC visited M/s Mundle Paint and Chemical Industry at Bhandara on 4th June, 2019 to discuss and validate the utility of chemically processed Partially Lateritic Khondalite (PLK) as filler material for its commercial utilization in paint industry. The in-situ tests at the unit revealed that the processed PLK material developed at JNARDDC is complementary and useful as a good quality substitute for metakaolin based commercial filler materials.

Officials from Dynamic Systems at JNARDDC

Dr Wayne Chen, Director of Research, Managing Director of Asia Pacific Operations, Dynamic Systems, Inc., USA and Mr Suyash Nadkarni, Director, Dynamic Technology System, India visited Centre on 6th June, 2019 to discuss the capabilities of Gleeble thermo-mechanical simulator for material modeling in casting, rolling, extrusion, friction stir welding as well as advanced applications such as dilatometric studies etc. Following Dr Chen’s technical presentation, it was mutually agreed to join hands for the future R&D endeavors.
JNARDDC is setting up state of the art SMS Group Make extrusion press of 1400 Ton capacity along with other auxiliary facilities. The key features of the press include 6 inch container diameter with two independent heating zones, isothermal, isobaric extrusion, closed loop control of ram speed along with safety interlocks and sensors to enable high quality research and development of aluminium extrusion at JNARDDC. To review the progress of the commissioning, a team from SMS led by Dr Hansjörg Hoppe, Head of Sales, Extrusion Presses visited JNARDDC on 19th June, 2019. As a number of R&D projects are in pipeline at JNARDDC, during the meeting Dr Hoppe promised to depute a highly capable and experienced team from SMS Germany to fast track the hot commissioning of the press.

Meeting of State Government officials with JNARDDC was organised to apprise them about the extensive work being carried out by JNARDDC in developing bauxite data banks for the various deposits in the country with special focus on deposits in Maharashtra State. Shri R S Kalamkar, Director, Directorate of Geology & Mining (DGM) & Dr Subrata N Das, Director, Maharashtra Remote Sensing Application Centre (MRSAC) attended the meeting. Mr Kalamkar deeply appreciated the efforts of JNARDDC and in particular the recently developed digital database on Bauxite and Laterite deposits of Maharashtra State using geo-informatics technology (jointly with GSI & MRSAC) which provides at a glance deposit scenario, data on geology, geomorphology, LULC, soil, slope, extensive information on cadastral, GIS, technological data, etc. He opined that documents available may be useful for e-auction process of the mineral blocks. He also suggested that mines/deposits which are not operational may be attempted for auction for various level block prospecting.
Sterlite Power Transmission Seeks Assistance from JNARDDC

Mr R Ananthakumar, Technical Manager and Mr Phanikumar, Quality Control Expert from Sterlite Power Transmission Limited, Silvassa visited Centre to explore the possibility of acquiring knowhow available with JNARDDC for the drastic reduction in ageing time for the production of STAL conductor. Sterlite team sought assistance in improving the quality of alloy wire rods being produced. JNARDDC has submitted the detailed proposal which is under active consideration of Sterlite authorities.

Industry Visit of New Scientists

Centre has recently recruited six new scientists to augment its technical strength. As a part of their induction program, they were sent to Hindalco, Mouda. This plant is mainly focused on the production of foil size ranging from 6-60 µm used for pharma and food applications. Mr Anand Datey and Mr Satinath Panja from Hindalco coordinated the visit and JNARDDC scientists were shown various facilities including continuous casting and foil rolling.
JNARDDC Participation in Exhibition at Raman Science Centre, Nagpur

JNARDDC actively participated in ‘Science Expo 2019’ organised at Raman Science Centre from 16-20th January, 2019 in collaboration with 15 Scientific and Research organizations. The event was aimed at bridging the gap between science and society, enlightening students about current research happening and motivate them to choose science as their career. The expo event, inaugurated by Dr Pramod M Padole, Director, VNIT along with Dr Rakesh Kumar, Director, NEERI was a huge success with widespread participation by students from Nagpur and adjoining areas. During the expo, students and other visitors interacted with JNARDDC team and clarified various scientific queries and expressed gratification on knowledge exchange and update on aluminium and relevant areas.

Vigyan Bharti Forum

JNARDDC is continuing to contribute good work initiated by Vigyan Bharati in various schools to help developing scientific temperament in students in early age. In this connection, students and faculties of the Hindu Mulinchi Shala, Mahal, Nagpur, visited JNARDDC to learn about the research activities and interact with JNARDDC team on 28th January, 2019. As many as 11 toppers (NRI students from UAE) of the Sastra Pratibha Contest visited JNARDDC to learn about research activities at Centre.
Educational Visit of Students to JNARDDC

The students from Shri R G Rathod Arts & Science College, Murtizapur, Mahatma Fule Arts, Commerce & Sitaramji Chaudhri Science Mahavidyalaya, Warud and Yashwant Mahavidyalaya, Kalmeshwar led by their faculties visited JNARDDC to get themselves acquainted with activities of the R&D Centre as a part of their curriculum activities. Students were enlightened while witnessing the functioning of Centre’s facilities and found some of the analytical instruments interesting which they hope to utilise for their upcoming project work.
JNARDDC Extends Support to Students from Hislop College, Nagpur

Four post graduate students of Chemistry discipline from Hislop College, Nagpur pursued short term projects at JNARDDC as a part of their curricular activities under the expert guidance of Scientists from Bauxite department. The students worked on research topics based on geopolymerization, acid leaching, nano materials preparation, and nanocoatings. Students have submitted the final reports to their college. The support, facilities and guidance provided by JNARDDC was deeply appreciated.

Summer Training for VNIT Students

JNARDDC offers various opportunities to the engineering & science students to gain knowledge on the aluminium processes. A total of 23 students from VNIT, Nagpur were enrolled for the summer training. Students were enlightened on aluminium processing right from bauxite to downstream activities through lectures, presentations and laboratory demonstrations. Hands-on training was also arranged for the students for their better understanding of aluminium technology.
Synergistic Utilization of Aluminium Industrial Wastes for Development of Geopolymeric Building Materials  
(Joint Project with M/S Swarnalata Holdings, Raipur)

Sponsor : S&T, Ministry of Mines, Govt of India and M/s Swarnalata Holdings  
Principal Investigator : Dr Mohammed Najar P A  
Co-Investigators : M J Chaddha, Dr P G Bhukte, M T Nimje, Dr S P Puttewar

Project activities successfully achieved the objectives which focussed on the synergistic utilization of industrial rejects of various origins. Ideal combination of materials in the mix-designs was identified from a wide range of materials including biomass ashes. Geopolymer developed were tested for crushing strength, efflorescence, water absorption and soda leaching. The product developed with different mix-designs show crushing strength variation from 4 MPa to 42 MPa. Accordingly the products were suitable for applications such as adobe for construction, partition wall, paver blocks, thermal insulator and ceramics after heat treatment. The cost estimation of product based on the laboratory trials were made for geopolymer products compared to fly ash bricks. It was observed, the major costing in geopolymer product depends on the use of alkali activator. Chemical and heat treatment methods were verified for restricting efflorescence. The experimental activities are completed and draft final report has been prepared.

Developing Downstream Applications of Strip Cast Aluminium Alloys AA8011 and AA3004  
(Joint Project with NALCO & VNIT, Nagpur)

Sponsor : S&T, Ministry of Mines, Govt of India  
Principal Investigator : R N Chouhan  
Co-Investigator : P Mahendiran

The formability and recrystallisation behaviours of strip cast and cold rolled AA8011 aluminium alloy sheets post-annealing treatment have been investigated. By carrying out the microstructure-texture characterisation and performing deep drawing and stretching tests, a combination of deformation-temperature-time characteristics that corresponds to the maximum formability of these sheets was optimised. The optimal clamping force required for deep drawing tests for sheets with different thicknesses has also been found. Subsequently, anodising characteristics of the sheets were studied by evaluating the anodised film thickness with different parameters like electrolyte bath temperature, voltage and time duration. The results are being utilized for taking trials on sheet samples for heat sink application.
Estimation of Morphodynamicity and Its Remedial Action Using Red-Mud Based Concrete at Coastal Zone of Eastern Odisha
(Joint Project with IIT, Bhubaneswar)

Sponsor : S&T Division, Ministry of Mines, Govt of India
Principal Investigator : Mukesh J Chaddha
Principal Co-Investigator : Dr Mohamed Najar P A
Co-Investigators : Manoj T Nimje, Dr S P Puttewar

The six month project included fine tuning and characterization of stabilized hard red mud blocks and geopolymer blocks carried out jointly by JNARDDC and IIT Bhubaneshwar, Odisha. The UAV drone was utilized to do coastal mapping of Kendraparha area where the blocks will be placed in second phase of the project to control erosion due to sea water.

Status Report on Work Carried out Nationally and Internationally on Red Mud to Benchmark Future Investigation in the Country

Sponsor : S&T Division, Ministry of Mines, Govt of India
Principal Investigator : Dr Suchita B Rai
Co-Investigators : Mukesh J Chaddha, M J Kulkarni

The objective of the project is to prepare a status report on work carried out nationally and internationally on red mud. Based on the data collected from alumina refineries in India and available literature, a detailed report has been prepared comprising of present disposal and storage practices employed in alumina refineries, red mud generation, characterization and its utilization. The report primarily focuses on present areas of utilization of red mud such as building materials, recovery of valuables such as iron, titanium, alumina, in vegetation, catalysts and as catalyst supports, pollution control, paints and pigments. The report has identified the research gaps in bauxite residue utilization and addresses all the issues related to red mud. The report would certainly help in identifying comprehensive re-use options of red mud and establishing knowledge sharing mechanisms for the aluminium industry over the world.
Nano Processing of Industrial Rejects for Use as Additives in Mix-Designs for Improved Pozzolanic Reaction Efficiency
(Joint Project with VNIT, Nagpur)

Sponsor          : S&T Division, Ministry of Mines, Govt of India
Principal Investigator  : Dr Priyanka Nayar
Principal Co-Investigator : Dr Mohamed Najar P A
Co-Investigators        : M J Chaddha, Dr S P Puttewar

Mechanical milling of wastes collected from aluminium and steel industries has already been completed at JNARDDC. VNIT has conducted tests (electrical conductivity, Chapelle Activity, Pozzolanic Activity Index) to check the pozzolanicity of the grounded wastes. Remarkable changes can be seen in the pozzolanic behavior of the materials before and after grinding those to nano level.

Utilization and Development of Process for Recovery of Strategic Rare-Earths from Industrial Waste-Bauxite Residue at Lab Scale
(Joint Project with HINDALCO) (With Support from IREL)

Sponsor          : Department of Science & Technology, New Delhi
Principal Investigator  : Dr Upendra Singh
Co-Investigators        : Dr S P Puttewar, Dr Priyanka Nayar

A comparative technical viability of beneficiation of bauxite residue using hydrocyclone and multi-gravity separator for REEs has been studied. It is observed that MGS provides better grade with reasonable recovery of REEs compared to hydrocyclone. Further, leaching experiments on the lab scale were conducted using both original and beneficiated feed to study their leaching characteristics. The leaching conditions were optimized with time, concentration and S/L ratio during investigation. Pre-concentration followed by acid leaching showed high leaching efficiencies of REEs in the leachate and better selectivity against iron. Leaching efficiencies obtained under the set leaching conditions were: >60% Sc, 75% La and 90% Ce. Leaching work carried out at gram level is being scaled up jointly by Indian Rare Earth Ltd (IREL)/JNARDDC to validate the process.

A feasibility trial study was carried out to extract lanthanum, cerium and scandium from the leach liquor of red mud using solvent extraction. Complete study on extraction and recovery at lab scale is under progress and further trials to achieve desired purity are also under trial.
**Development of Ceramic Proppant from Low Grade Materials**
*(Partially Lateritised Khondalite - PLK, Fly Ash, etc.) (Phase-II – Scale up Studies)*

**Sponsor:** NALCO, Bhubaneshwar, Odisha  
**Principal Investigator:** Dr Pravin G Bhukte  
**Co-Investigators:** Dr S P Puttewar, Dr Mohamed Najar P A

Objective of the project is to set up a facility for the production of proppants from Partially Lateritised Khondalite (PLK), Fly ash, additives etc. and optimization of the same at bench scale (10-15 kg/day processing).

The samples of PLK, sillimanite, pyrophyllite, fly ash etc. have been prepared for granulation studies. The granules of varying size have been prepared by using mixer cum granulating machine. The trials for development of high strength product (proppants) by using additives at laboratory scale is going on. The required infrastructure/ facilities and procurement of equipments (rotary kiln and proppant crush test press) for setting up of scale up ceramic proppant plant is under progress.

**Fabrication of Advanced Ceramic Nano-Coatings for Automotive Applications**
*(Joint Project with Christ University, Bangalore)*

**Sponsor:** S&T Division, Ministry of Mines, Govt of India  
**Principal Investigator:** Dr Priyanka Nayar  
**Co-Investigators:** Dr S P Puttewar, Dr Mohamed Najar P A

Process parameters (RPM, deposition time, acceleration) for alumina coating deposition using sol gel and spin coating techniques were optimized. Project partner has installed a 5 hp single cylinder diesel engine in order to select the engine components which needs to be coated for wear resistant applications. JNARDDC will coat the selected components by spin coating process which will later be verified by automobile department in Christ University, Bangalore.

**To Study the Fire Retardancy of Nano-ATH in Polymers**
*(Joint Project with CIPET, Bhubaneswar)*

**Sponsor:** S&T Division, Ministry of Mines, Govt of India  
**Principal Investigator:** Dr Suchita B Rai  
**Co-Investigators:** M J Chaddha, M T Nimje, R J Sharma, K J Kulkarni

Presently high loading (30-60%) of ATH to the polymers is in practice to get appropriate fire retardancy which leads to decrease in mechanical strength of polymers. Using Nano size ATH will reduce the loading to 2-3% and will improve the fire retardancy and mechanical properties of polymers. Nano size aluminum hydroxide have been synthesized at JNARDDC for its incorporation in polymers at CIPET. Fire retardancy and other properties such as TGA, DSC, Vertical burning test, Cone Colorimetry study are being carried out at CIPET.
Recovery of Smelter Grade Alumina and Silica from Coal Fly Ash

**Sponsor** : S&T Division, Ministry of Mines, Govt of India  
**Principal Investigator** : M T Nimje  
**Co-Investigators** : Dr Suchita B Rai, R J Sharma, V K Jha

Aim of the project is to develop bench scale process for the extraction of pure silica and aluminium fluoride from abundantly available Coal Fly Ash (CFA)- solid waste being generated in thermal power plants around the country. Completed the detailed characterisation studies on coal ash samples collected from different hoppers of power plant situated around Nagpur. Studies for optimization of process parameters for extraction of pure silica in vapour phase and aluminium fluoride from liquor are underway.

Techno-economic Survey of Aluminium Scrap Recycling in India (Joint Project with MRAI)

**Sponsor** : S&T Division, Ministry of Mines, Govt of India  
**Principal Investigator** : R N Chouhan  
**Co-Investigators** : VNSUV Ammu, P Mahendiran

A meeting with Materials Recycling Association of India (MRAI) officials was convened in Mumbai during 17th March 2019 for discussing about the course of actions to be taken for the project. In this regard, two aluminium recycling plant visits (Sunalco Alloys and CMR-Nikkei Pvt. Ltd.) were organized to understand the processing and operations of recycling industry. Based on the initial interactions, a detailed questionnaire was prepared by JNARDDC and submitted to MRAI. Also, a literature review on the international practices, rules, regulations, technology, equipment is being done and a training module is being compiled.
Development of Inline Automated Anode Butt Monitoring System to Measure Anode Butt Parameters (Joint Project with NALCO)

Sponsor: NALCO, Bhubaneshwar, Odisha
Principal Investigator: Vimal Kishor Jha
Co-Investigator: Rajendra J Sharma, M T Nimje

Objective of the project is to develop an automated visual inspection system of anode butts processed at the rod shop. Image analysis methodologies has been studied for smoothing the image with various filters to reduce noise, unwanted details and textures. A multi-stage algorithm for edge detection has been developed for finding the edges of anode butt. Prototype anode butt assembly also has been fabricated for exploring the methodologies for estimation of structural parameters of the same. Various Illumination Techniques (Direct front illumination, Diffuse bright-field illumination, Diffuse dark-field illumination, Dark-field illumination, Backlighting) suitable for machine vision has been studied and tested in laboratory with the prototype anode butt assembly. Designing of networking hardware/software for capturing and transferring the captured images to control room is in progress. Feasibility study for interfacing of other hardware parts (networking hardware & sensor) with camera is underway. Visited rodding shop at Angul plant and took images of the anode butt assembly with variations in various parameters which can affect our image analysis work.

Utilization of PLK (Partially Laterised Khondalite) as a Potential and Value-Added Filler Material with Specific Reference to White Ceramics and Pigments (Joint Project with C V Raman College of Engineering & NALCO)

Sponsor: NALCO, Bhubaneshwar, Odisha
Principal Investigator: Dr Mohamed Najar P A
Co-Investigators: Dr P G Bhukte, M J Chaddha

The joint research activities currently focussed on the bulk sample generation of PLK (low Fe₂O₃ and high Al₂O₃ and SiO₂) and validation so that the treated PLK could be used as a value-added filler material for industries like ceramics, paper, paint etc. Accordingly, validation trials are initiated at CGCRI, Kolkata. The refractive index value of treated PLK has been verified to confirm its suitability for paint industry applications.
Development of a Wi-Fi Enabled Sensor Arrangement for Online Measurement of Anode Current Distribution of Aluminium Electrolysis Cell (Joint Project with NALCO)

**Sponsor**: NALCO, Bhubaneshwar, Odisha  
**Principal Investigator**: Rajendra J Sharma  
**Co-Investigator**: Vimal Kishor Jha

Objective of the project is to develop a Wi-Fi enabled system for online measurement of anode current distribution of aluminium electrolysis cell. The continuous data collected can be utilized for understanding the process in depth leading in reducing cell instabilities and improved pot control & efficiency. Wi-Fi and Bluetooth enabled, Temperature and magnetic field resistant device has been designed for measurement of voltage drop between the two points of the beam. For proper contact between the sensor and the beam, spring loaded probe has been developed. A trial has been taken in pot by installing 2 numbers of detachable spring-loaded contact probes on the beam and results were found satisfactory. Also sustainability check has been carried out for six days in the plant.

Technological Characterization of Bauxite Sample for Establishing the Mass Balance of the Process Design of the Expansion Study at Vedanta Limited, Lanjigarh, Kalahandi, Odisha

**Sponsor**: Vedanta, Lanjigarh, Odisha  
**Principal Investigator**: Mukesh J Chaddha  
**Co-Investigators**: Kishore Kulkarni, Dr Suchita B Rai, Rajendra J Sharma, Prachiprava Pradhan, Upendra Singh

Vedanta Alumina refinery had assigned the job to JNARDDC for conducting technological studies on bauxite from Kodingamalli mines in Odisha. The project includes chemical/mineralogical characterization of bauxite along with determination of bond work index. The technological studies were conducted with the bauxite for optimizing parameters required for each unit operation of Bayer process such as Pre-desilication, digestion and settling to optimize the flocculant dosages. Also rheological studies were carried out for mill slurry, pre-desilicated slurry and last washer underflow solids with different solids content. The Process parameters thus established will be helpful to Worley Parsons (Technology supplier of Vedanta) in designing, manufacture and supplying the refinery equipment.
NEW PROJECTS

Development of a Process Technology (at Lab Scale) for Low Cost Production of 3N (99.9%) Pure Alumina

Sponsor: Department of Science & Technology, New Delhi
Principal Investigator: Dr Priyanka Nayar
Co-Investigators: Dr Mohamed Najar, Mukesh J Chaddha, Dr Suresh Puttewar, Dr Upendra Singh

Objective of the project is to develop the process know how for the low-cost production of 3N pure alumina suitable for LED (Light Emitting Diode) and Semiconductor applications. Challenge is to get the required product at much low temperature. This project also focuses on the theoretical study of cost economics for 3N pure alumina synthesis process.

Technical Feasibility Study for Extraction of Alumina as Aluminium Fluoride from Low Grade Bauxite

Sponsor: International Bauxite Alumina & Aluminum Society (IBAAS), Nagpur
Principal Investigator: M T Nimje
Co-Investigators: Dr Suchita B Rai, Dr Pravin Bhukte, V K Jha, S K Thokal & S U Bagde

Aim of the project is to convert the aluminium compounds (gibbsite, monohydrate) present in low grade bauxite to aluminium fluoride using fluoride reagents and confirm the technical viability of the process on laboratory scale. Conducted the heat treatment studies on the bauxite sample provided by IBAAS to ensure stability of alumina phase during leaching experiments to be attempted subsequently for removal of iron and other impurities.
Research Papers Published


Research Paper Presented / Published in Conference Proceedings

- Value-added geopolymer products to offset expenditure on waste management and sustainability, Mohamed Najar, Vishakha Sakhare, Shama Wadsariya, Numanuddin Azad, Sneha Dwivedi, Amrita Karn, Pravin Bhukte, Suresh Puttewar, Anupam Agnihotri; 7th International Conference & Exhibition on Aluminium (INCAL-2019), Bhubaneswar, 31st Jan-3rd Feb, 2019.

- Design of porthole dies and weld strength criteria in aluminium extrusion, VNSU Vishwanath Ammu, P Mahendiran, R N Chouhan, Samrat Ambade, P R Dungore, Anupam Agnihotri; 7th International Conference & Exhibition on Aluminium (INCAL-2019), Bhubaneswar, 31st Jan-3rd Feb, 2019.


- Disposal practices and utilization of red mud; a review in Indian context and abroad, Suchita Rai, Sneha Bahadure, M J Chaddha, A Agnihotri; 7th International Conference & Exhibition on Aluminium (INCAL-2019), Bhubaneswar, 31st Jan-3rd Feb, 2019.


- Quality of AA6063 Alloy Billets, R N Chouhan, P Mahendiran, A Agnihotri; Conference on Recycling of Aluminium for Alloy Manufacturing and Extrusion Billet Casting, Pune, 25-26th April, 2019.
Invited Lectures

Aluminium in Circular Economy, Dr Anupam Agnihotri; 7th International Conference & Exhibition on Aluminium, Bhubaneswar, 31st Jan- 3rd February, 2019.


Importance of Basic Science for Technology, R N Chouhan; Jawaharlal Nehru Arts Commerce & Science College, Wadi, Nagpur, 20th February, 2019.

Patents Filed

Best Paper Awards at INCAL-2019

During the “7th International Conference & Exhibition on Aluminium (INCAL-2019)” held at Bhubaneswar during 31st January to 3rd February, 2019, Mr VNSUV Ammu and Dr Priyanka Nayar received best paper awards for their work on “Design of Porthole Dies and Weld Strength Criteria in Aluminium Extrusion” and “Preparation of 3N Pure Alpha Nano-Alumina at Low Temperature”, respectively. JNARRDC extends its heartiest congratulations to the awardees for their achievement which will certainly motivate the others also.

Certificates of Appreciation to the Awardees
JNARDDC Participation in INCAL-2019

JNARDDC participated as one of the key knowledge partners in 7th International Conference & exhibition on Aluminium (INCAL-2019) held at Bhubaneswar from 31st January - 3rd February, 2019. This conference provided a perfect platform to exchange ideas on latest technological advances, discover novel opportunities, extensive networking, growth potential opportunities and challenges ahead etc. JNARDDC conducted a day-long session on red mud disposal and utilization at the conference on 2nd February, 2019. Proceedings of a complete session on ‘Bauxite Residue, Wastes & Environment Management’ (with primary focus on bauxite residue waste management and utilization) was compiled at INCAL-2019. Six research papers from JNARDDC were presented at the conference out of which two bagged best paper award.

JNARDDC Participation in European Union – Resource Efficiency Initiative

As part of the European Union – Resource Efficiency Initiative (EU – REI) funded by the European Commission, a project consortium comprised of GIZ, Adelphi, TERI and CII are providing technical assistance to the Indian Resource Efficiency (RE) initiative. This is done through, amongst other activities, exposure tours to European countries. A second exposure tour took place in Germany and Belgium from 20-28th February, 2019, back to back with this year’s World Resources Forum in Antwerp. The tour targeted Indian policy makers and stakeholders from MoEF & CC, TERI, NITI Aayog, JNARDDC and SRTMI who are currently contributing towards the formulation of Indian Resource Efficiency (RE) policy. The programme provided insights into the preparation and application of policy instruments that promote RE and CE (Circular Economy) at different levels (national, federal and regional) in the European context. The exposure tour fostered mutual exchange and dialogue on sectoral learnings, thus opening the opportunity to deepen collaboration between India and the EU in the area of RE and CE.

Dr Agnihotri in Discussion with Environment Minister, Belgium
**Dr Anupam Agnihotri gets Second Term as Director**

Dr Anupam Agnihotri has been given another five-year term as Director JNARDDC with effect from 1st April, 2019. His dedicated efforts, motivation, technical support, guidance and excellent performance at Centre prompted Government of India in reaffirming its faith in him. Centre is confident that he will complete his unfinished tasks with more vigour and energy which will help JNARDDC in surpassing all its previous performance records and winning accolades nationally and internationally. On behalf of entire staff of JNARDDC we wish Dr Agnihotri every success in his present assignment.

**Deputy Secretary, MoM visited JNARDDC**

Shri H K Mallick, Deputy Secretary, Ministry of Mines, New Delhi visited JNARDDC on 5th April, 2019 to review the activities of Centre. He interacted with JNARDDC personnel and applauded the Institute for the development and supply of online apparatus for onsite measurement of bath parameters during aluminium electrolysis to Hindalco. Mr Mallick emphasized the need for setting up pilot plants for patented technologies. He assured the full administrative and technical support of Ministry.
Review of JNARDDC Activities by Ministry of Mines

Dr K Rajeswara Rao, Additional Secretary, Ministry of Mines, Govt of India held discussions with Director, and departmental heads of JNARDDC on 10th April, 2019 at Indian Bureau of Mines, Nagpur. He reviewed the technical activities and performance of the Institute during 2018-19 and suggested JNARDDC to focus on the theme of lab to market in the current year 2019-20 with a view to commercialize the technologies developed in the Centre. He congratulated the scientists for their various notable achievements for publications, patents and awards.

Meeting on Establishing Technologies for Rare Earths Extraction from Fly Ash and Red Mud, NITI Aayog

JNARDDC in association with NITI Aayog, New Delhi has organized 6th Meeting for establishing technologies for Rare Earths Extraction from Fly Ash and Red Mud on 16th April, 2019. The main purpose of the meeting is to discuss about technologies for extraction of rare earths from Red Mud and indigenization of these technologies on pilot/commercial scale. Participants discussed various promising routes for recovery of values from Bauxite Residue (BR) and their selection based on mineral composition of BR. Pilot scale processes for recovery of alumina, iron, titanium and rare earths from BR were also reviewed during the meeting. JNARDDC will focus on identifying challenges for scale-up and will initiate technology development for recovery of values from BR.
JNARDDC celebrated its 30th Foundation Day on 29th April, 2019. The function was inaugurated by Chief guest, Dr Ranjit Rath, CMD, MECL, Nagpur who appreciated the development and milestones achieved by the Institute in the last 30 yrs. He also highlighted the aspects of mineral security, extraction of rare earth elements and other valuables from the industrial waste for the sustainable development of country. The guest of honour, Shri G Vidyasagar, Additional Director General, Geological Survey of India (GSI), Central Region, Nagpur also applauded the work done in field of mineral ore. Dr Anupam Agnihotri, Director, JNARDDC projected the financial growth of Centre including the salient achievements of 2018-19 which included 10 completed projects, 4 patents and several publications. Once again Centre has been nominated as sector expert by Bureau of Energy Efficiency, New Delhi as well as the work done on waste management at the Centre has been recognized by CPCB, and NITI Aayog. Centre is in the final stages of successfully commissioning the extrusion unit of 1400 tons to meet the requirement of R&D for the extrusion industry. The officials from various organizations such as GSI, IBM, MECL, NEERI, MSME, MINEX CMFIR, and MOIL were presented for the above function. Certificate of appreciation was awarded to the best employee of the year, Dr SP Puttewar, HoD (Bauxite) and also to other employees for their technical achievements.

Improving resource efficiency is among the top priorities in today’s world, as governments, businesses and civil society are increasingly concerned about natural resource use, environmental impacts, material prices and supply security. As JNARDDC is associated with NITI Aayog & Ministry of Mines for the resource efficiency program, a panel discussion on “Resource Efficiency in Aluminium” was organised on 29th April 2019. The panelist for the discussion were Dr Ranjit Rath, CMD, MECL, Shri G Vidyasagar, ADG & HOD, GSI(CR), Nagpur, Dr Rajesh B Biniwale, Senior Principal Scientist & Head, CTMD, CSIR-NEERI, Dr P K Jain, Chief Mineral Economist, Indian Bureau of Mines and Dr Anupam Agnihotri, Director JNARDDC. The discussion focused on the need of the resource efficiency in Indian aluminium industry to assess future demand for resources and promoting pathways for waste management and circular economy.
BIS Panel Discussion on Draft Standards for Aluminium Scrap at JNARDDC

Bureau of Indian Standards (BIS) constituted a panel consisting of personnel from primary and secondary aluminium industries as well as organizations viz AAI, MRAI etc. for the evaluation of the draft standard for aluminium scrap. Dr Agnihotri, being panel convener called a meeting at JNARDDC on 27th May, 2019 for discussion in this regard. Independent opinions from the panelists were compiled by JNARDDC and forwarded to BIS member secretary for MTD-7.

International Yoga Day at JNARDDC

JNARDDC and NIMH jointly organised International Yoga Day on 21st June, 2019 with great enthusiasm. On this occasion, eminent yoga educator, Shri Nagesh Ghodki from Janardan Swamy Yogabhyaasi Mandal, Ram Nagar, Nagpur demonstrated different yogasanas and enlightened the participants about rich benefits of making yoga as integral part of one’s life. The Director thanked all the employees of JNARDDC and NIMH for their active participation and cooperation.
Safety Audit on the Extrusion Press, JNARDDC

To upgrade the Centre’s safety as per the National Safety Standards, Statutory and Regulatory requirements (IS 14489:1998, Factories act 1948), JNARDDC invited Mr Mohan Rao (Safety Auditor) and Mr A Ravi (Technical Expert) to perform a pre-execution Health Safety Environment Management System (HSEMS) audit on the Extrusion press during 27-28th June, 2019. The scope of this audit was to identify all the reasonable foreseeing hazards that could give risk to the personnel and instruments involved, as well as to provide adequate safety remedial measures.

Employee of the Year 2018-19

Dr Suresh P Puttewar, HoD (Bauxite) was awarded the “Employee of the year 2018-19” for his outstanding services to the Centre. In the last 27 years he has been a part of several key projects executed for the aluminium industries, bauxite miners, Ministry of Mines and other agencies. His efficient managerial skills helped JNARDDC in completing time-bound testing assignments of GSI and MECL. His group has generated the maximum revenue for JNARDDC. Being the chairman of the purchase committee he has also effectively guided the purchase activities.
RECRUITMENT OF SCIENTISTS

Dr Papa Rao Mondi, Scientist
Date of joining : 01-02-2019
Qualification : PhD (IIT Madras) & M Tech (NIT Trichy) in Metallurgical & Materials Engineering (MME)
Experience : Asst. Manager at JSW Steel Ltd., Bellary, Karnataka (3.5 years)
Publications : 6

Mr Ramavajjala Anil Kumar, Junior Scientist
Date of joining : 18-01-2019
Qualification : M Tech (IIT Madras) & B Tech (NIT Warangal) in Metallurgical & Materials Engineering (MME)
Experience : Lecturer in the Department of MME at IIIT-R.K. Valley, RGUKT-A.P. (4.8 years)

Ms Prachiprava Pradhan, Junior Scientist
Date of joining : 31-01-2019
Qualification : M Tech in Chemical Engineering (NIT Rourkela)
Experience : Assistant Professor in the Dept. of Chemical Engineering, Parul University & Scientist Fellow at CSIR-IMMT, Bhubaneswar (3.5 years)
Publications : 1

Mr Kola Immanuel Raju, Junior Scientist
Date of joining : 18-02-2019
Qualification : M Tech in Materials Engineering (IISc Bangalore) & B Tech in Metallurgical & Materials Engineering (NIT Warangal)
Experience : Post Graduate Engineer Trainee (PGET) at Tata Motors ERC, Pune & GET at Hindalco (1.5 years)
Publications : 1

Ms Jyoti Pendam, Junior Scientist
Date of joining : 05-03-2019
Qualification : MSc in Chemistry (Rashtrasant Tukdoji Maharaj Nagpur University) Nagpur
Experience : Junior Chemist in Maharashtra State Power Generation Co. Ltd. (MSPGCL) at Koradi Thermal Power Plant, Nagpur (2 years) Research Assistant & Technical Assistant at VNIT Nagpur (4 years)

Dr Anas N S, Junior Scientist
Date of joining : 18-01-2019
Qualification : PhD in Materials Engineering (University of Hyderabad, Hyderabad) M Tech in Nanotechnology (NIT Calicut), B Tech in Mechanical Engineering (University of Calicut)
Experience : Senior Research Fellow at ARCI, Hyderabad (6 years)
Publications : 6
NEW EQUIPMENTS

RHEOMETER

JNARDDC has recently acquired a Rheometer to study the stress-deformation behaviour of different solutions and slurries. Equipped with advanced software to analyse the data and temperature control from -40 to 200°C, this instrument can determine various parameters of slurries like plastic viscosity, yield point, flow behavior index, flow consistency etc. In particular, rheometer find applications in alumina refinery to understand the rheological characteristics of bauxite slurries during different stages of processing including pre-desilication, digestion, settler and washer units.

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<tr>
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<td>Torque range - Viscometry</td>
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OBITUARY

Bablu Mohadikar (house keeping contract) met a tragic end at the tender age of 27 years due to a major road accident on 30th May, 2019. He was a very hard working and sincere person. His untimely loss was mourned by his mother, sister and several well wishers. The JNARDDC employees and staff members made a personal collection of Rs. 65,000/- and handed over to his bereaved mother.

भावपूर्ण श्रद्धांजली
IBAAS-2019

International Bauxite, Alumina, & Aluminium Society (IBAAS) in collaboration with Guiyang Aluminium & Magnesium Design Institute Co. Ltd. (GAMI), the leading Aluminium Design Centres of China, is organising 8th IBAAS International Conference & Exhibition (IBAAS–GAMI-2019) in Guiyang, China during 4 - 6th September, 2019. The theme of the IBAAS-GAMI-2019 Conference & Exhibition is “Technological Advances in Alumina, Aluminium Smelter, Downstream Operations, Energy Conservation, Environmental Control and Intelligent Manufacturing with Special Reference to China”.

JNARDDC is an associate organizer for the event and also organizing special session on “Aluminium Extrusion: Primary & Secondary: does it really matter?” to bring the primary and secondary industry on the same platform to discuss and mitigate the concerns.

Indo-European Meet on Effective Utilisation of Red Mud-Phase II

Ministry of Mines (MoM) in association with Ministry of Environment Forest & Climate Change (MoEFCC), Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), European Union-Resource Efficiency Initiative (EU-REI) & European Union (EU) is organizing an interactive Indo-European meet on “Resource Efficiency in the Aluminum Industry with a Focus on Effective Utilization of Red Mud (Bauxite Residue)” on 19th September, 2019 at Hotel Taj Mansingh (Hotel Taj Mahal), New Delhi.

The theme of the meet is to share the knowledge available in India and EU on how to make best use of bauxite residues, to exchange the experiences among stakeholders from government, private and public sector and to discuss the possible future cooperation among business partners and R&D institutions.

Capacity Building Programme

Based on the recommendations of Ministry of Mines (MoM) and NITI AAYOG for resource efficiency in aluminium, Jawahar Lal Nehru Aluminium Research Development and Design Centre (JNARDDC) in association with Aluminium Association of India (AAI) and Material Recycling Association of India (MRAI) will be organizing a three days “Capacity Building and Awareness Program on Aluminium” at Bhubaneswar in October -November 2019.

A circular economy, is an alternative to a traditional linear economy (make, use, dispose) in which resources are kept in use for as long as possible, the maximum value is extracted from them whilst in use, the products and materials are recovered and regenerated at the end of each service life. This economic system, aimed at minimizing waste and making the most of resources, will be focus of the capacity building program.
SPOTLIGHT

JNARDDC, MRAI sign MoU to promote waste mgmt in aluminium industy

By Staff Reporter

JNARDDC, National Aluminium Research Development and Design Centre (JNARDDC), Nagercoil, and MRAI, Malaysia Recycling Association (MRAI), have signed a Memorandum of Understanding (MoU) to promote sustainable aluminium recycling and develop new processes and technologies in aluminium industry waste management and recycling. The MoU will be implemented across the globe. Dr. Anupam Agnihotri, Director, JNARDDC, Nagercoil, and Sanjiv Mehta, President, MRAI, were present during the MoU signing. The MoU aims to enhance collaboration between the two organizations to develop new technologies and processes for aluminium recycling, which will help in reducing the environmental impact of the aluminium industry and promote sustainable practices. The MoU will also provide a framework for future R&D activities and technical collaboration between the two organizations.

Dr Agnihotri re-appointed as JNARDDC Dir

DR ANUPAM AGNIHOTRI has been re-appointed as the Director of the Jamnabai Narsee Aluminium Research Development and Design Centre (JNARDDC), Nagercoil. His second tenure will commence from April 1. Dr. Agnihotri’s appointment was approved by the Appointments Committee of the Cabinet. Dr Agnihotri, a metallurgist, is a leading expert in the field of Aluminium recycling and processing. After completing his M.Tech in Metallurgy from IIT Roorkee, he obtained a PhD from IIT Kanpur and has more than 15 years of experience in the field. He is known for his contributions to the development of advanced aluminium alloys and their application in various industries.

JNARDDC to help EU for economical, bulk utilisation of aluminium waste

By Sundar Mahadevan

The JNARDDC, a leading aluminium research and development centre in India, is working on a project to help the European Union (EU) in the economical and bulk utilisation of aluminium waste. The centre is collaborating with the EU in this project to enhance the efficiency of the aluminium recycling process and reduce the environmental impact of the aluminium industry. The centre is also working on developing new technologies and processes for aluminium recycling, which will help in reducing the environmental impact of the aluminium industry and promote sustainable practices. The centre is expected to play a significant role in the development of new technologies and processes for aluminium recycling, which will help in reducing the environmental impact of the aluminium industry and promote sustainable practices.

National Mission on Red Mud Extraction needed: NITI Aayog

By Staff Reporter

The National Mission on Red Mud Extraction is needed to address the issue of red mud disposal, which is a significant environmental challenge in the aluminium industry. The mission is expected to address the issue of red mud disposal and promote sustainable practices in the aluminium industry. The mission is also expected to address other environmental challenges in the aluminium industry, such as air and water pollution. The mission is expected to play a significant role in the development of new technologies and processes for aluminium recycling, which will help in reducing the environmental impact of the aluminium industry and promote sustainable practices.

Niti Aayog, JNARDDC to jointly hold meet on rare earth extraction

By Staff Reporter

The Niti Aayog, a leading policy advice body in India, is working on a project to hold a joint meeting with the JNARDDC to discuss the issue of rare earth extraction. The centre is collaborating with the Niti Aayog in this project to address the issue of rare earth extraction and promote sustainable practices in the aluminium industry. The centre is also working on developing new technologies and processes for aluminium recycling, which will help in reducing the environmental impact of the aluminium industry and promote sustainable practices. The centre is expected to play a significant role in the development of new technologies and processes for aluminium recycling, which will help in reducing the environmental impact of the aluminium industry and promote sustainable practices.
To,
The Director,
Dr. Anupam Agnihotri,
JNARDDC, Nagpur.

Sub: Letter of Appreciation

Dear Sir,

We at TAL Manufacturing Solutions Ltd., Nagpur are in the business of Aerostructure parts manufacturing.

We were facing a problem of conductivity variation in two of extrusion parts made up of 2024-AL alloy with LN9496 spec. The parts were machined, solution annealed, formed & artificially aged to convert to T62 & were failing in conductivity.

We approached JNARDDC with the problem. Your team did detailed analysis of the problem and conducted trials at your research centre & came out with optimized heat treatment cycles of Annealing & Artificial Aging which proved to be complete success with 100% acceptance of parts in conductivity test.

We appreciate your efforts in solving this problem and achieving the success. We look forward to work together on various improvement projects in future.

Thanking you.

With warm regards,

Rajeev Kapoor
Sr. GM - Operations
TAL Manufacturing Solutions Ltd.,
A subsidiary of TATA Advance System Ltd.
Inductively Coupled Plasma Mass Spectrometer (ICP-MS)

Model : NEXION 2000 ICP-MS
Make : Perkin Elmer

Inductively Coupled Plasma Mass Spectrometry is one of the most important technique for elemental analysis because of its low detection limits for most elements, its high degree of selectivity and its reasonably good precision and accuracy. This technology couples use of an ICP (Inductively Coupled Plasma) with MS (Mass Spectrometer) for elemental analysis where generation of ions takes place in ICP while the detection of elements takes place in MS.

Features
- The ICP-MS allows determination of elements with atomic mass ranging from 7 to 250 (Li to U).
- NEXION 2000 ICP-MS instrument is a robust, high-performance, entry-level system that performs typical ICP-MS analyses of samples using any of three modes: Standard (for samples with no significant spectral interferences); KED (for samples with simple polyatomic interferences); and DRC mode (for high-sensitivity elemental analyses involving complex spectral interferences).
- The instrument provides outstanding stability, signal sensitivity, and precision, producing low levels of oxides and doubly charged ions, and minimal background interference.
- A single collector ICP-MS uses a multiplier in pulse counting mode to amplify very low signals, an attenuation grid or a multiplier in analogue mode to detect medium signals, and Faraday cup/bucket to detect larger signal.
- Best in-class scanning and data acquisition speeds (100,000 points/sec).

Capabilities
- Instrument detection limits are at or below the single part per trillion (ppt) level for most of the elements.
- Precious metal/ heavy metal estimation at ppb/ppt level.
- Productivity is unsurpassed by any other technique.
- Isotopic analysis achieved readily.
- Simultaneous multi-element analysis is possible.
- Ideal for environmental, biomonitoring, pharmaceutical, food, geochemical and general testing laboratories with moderate to heavy loads of samples comprising a wide range of concentrations.
- Complete analysis of rock, soil, fly ash etc.