संवादपत्र
NEWSLETTER

35 Years of Commendable Service
to the Aluminium Industry

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पेटेंट कार्यालय,भारत सरकार
पेटेंट प्रमाण पत्र |
The Patent Office, Government Of India
Patent Certificate

पेटेंट सं. / Patent No. : 333417
आवेदन सं. / Application No. : 201721032156
फाइल करने की तारीख / Date of Filing : 12/09/2017
पेटेंटी / Patentee : 1.JAWHARLAL NEHRU ALUMINIUM RESEARCH DEVELOPMENT AND DESIGN CENTRE 2.NONFERROUS MATERIALS TECHNOLOGY DEVELOPMENT CENTRE (NFTDC)

एतद्वारा दिया जाता है कि पेटेंटी को, उपरोक्त आवेदन में प्रकाशित *AN IMPROVED HEAT TREATMENT PROCESS FOR PRODUCTION OF HEAT RESISTANT AL-ZR ALLOY WIRE FOR OVERHEAD CONDUCTOR* नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख सितम्बर 2017 से बारहवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled *AN IMPROVED HEAT TREATMENT PROCESS FOR PRODUCTION OF HEAT RESISTANT AL-ZR ALLOY WIRE FOR OVERHEAD CONDUCTOR* as disclosed in the above mentioned application for the term of 20 years from the 12th day of September 2017 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख / Date of Grant : 17/04/2024

Controller of Patents

टिप्पणी - इस पेटेंट के नवीकरण के लिए शीर्ष, यदि इसे बनाए रखा जाना है, सितम्बर 2019 के बारहवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।

Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 12th day of September 2019 and on the same day in every year thereafter.

An improved heat treatment process for production of heat-resistant Al-Zr alloy wire for overhead conductor

RC-1022 TC-8254

जवाहरलाल नेहरू एल्युमिनियम अनुसंधान विकास एवं अभिकल्प केन्द्र, नागपुर

Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur

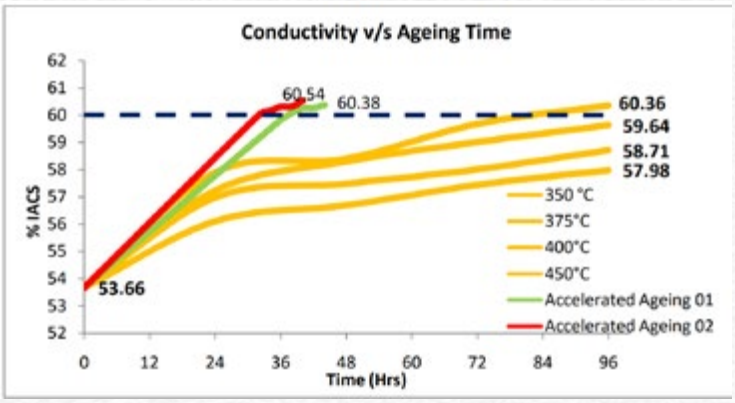
www.jnarddc.gov.in

Development of Super Thermal Aluminium (STAL) Conductor Alloy for Indian Power Sector (Patent No: 533417 Date of grant: 17-04-2024)

The Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) has successfully developed Super Thermal Resistant Aluminium Conductors with enhanced ampacity and optimized thermal and mechanical properties and a patent has been awarded on 17th April 2024. This breakthrough is set to benefit the Indian Electrical (Transmission & Distribution) sector significantly.

An aluminium-zirconium based electrical conductor alloy, with varying Zr concentrations, was initially produced at the laboratory level and subsequently at an industrial scale. A significant achievement of this project is the development of indigenous know-how for producing the Super Thermal Aluminium alloy for transmission line conductor applications. Notably, a considerable reduction in heat treatment time, a critical factor in industrial production cycles, was achieved. The process achieves the desired properties in less than 40 hours, compared to the conventional process which takes over 100 hours. This reduction will enable the industry to save energy and lower the cost of conductors. The indigenously developed technology is expected to be highly economical for the Indian cable industry, particularly for Micro, Small, and Medium Enterprises (MSMEs), aligning with the government's Make in India initiative. This development will contribute significantly to the electrical sector at large.

Drawn wires of different diameters



Comparison of conventional (yellow lines) versus JNARDDC developed heat treatment process (red & green lines)

निदेशक का प्रतिवेदन
DIRECTOR'S MESSAGE

हमारे सभी पाठकों को नमस्कार. इस वर्ष के हमारे न्यूज़लेटर के दूसरे संस्करण में आपका स्वागत है। 2023 में एल्युमीनियम बाजार को कई चुनौतियों का सामना करना पड़ा है, जिसने इसकी कीमतों को विभिन्न तरीकों से प्रभावित किया है। घरेलू स्तर पर, आगामी वित्तीय वर्षों में एल्युमीनियम की मांग लगभग 9% बढ़ने की उम्मीद है। इस विकास दर के वैश्विक मांग से अधिक होने की उम्मीद है, जो 2024 में 1.4% बढ़कर 98.3 मिलियन टन तक पहुंचने का अनुमान है, जो मुख्य रूप से परिवहन क्षेत्र और इलेक्ट्रिक वाहनों और पैकेजिंग में एल्यूमीनियम के बढ़ते उपयोग से प्रेरित है।

चक्रीय अर्थव्यवस्था और स्थिरता की ओर वैश्विक बदलाव के साथ, भारत भी इन सिद्धांतों को अपना रहा है। इसके अनुरूप, मुझे जेएनएआरडीडीसी में एक नए रीसाइक्लिंग डिवीजन की स्थापना की घोषणा करते हुए खुशी हो रही है, जिसका उद्देश्य गैर-लौह धातु रीसाइक्लिंग उद्योग से उत्पन्न कचरे का रीसाइक्लिंग और उपयोग को बढ़ावा देना है। इसके अतिरिक्त, हम सामान्य मैल-उपचार सुविधाएं स्थापित करने के लिए एल्यूमीनियम रीसाइक्लिंग क्लस्टर के साथ सक्रिय रूप से सहयोग कर रहे हैं। इसके अलावा, खान मंत्रालय के मार्गदर्शन में, हमने 15 स्टार्टअप और एमएसएमई को अनुदान प्रदान करते हुए S&T PRISM 1.0 और 2.0 को सफलतापूर्वक लागू किया है। PRISM 1.0 के लिए अनुदान की पहली किश्त वितरित कर दी गई है, और PRISM 2.0 के लिए पुरस्कार पत्र जारी कर दिए गए हैं, और धनराशि जल्द ही जारी की जाएगी।

मैं An improved heat treatment process for the production of heat-resistant Al-Zr alloy wire for overhead conductors पर पेटेंट हासिल करने के लिए अपने सहयोगियों को बधाई देता हूं, जिससे भारतीय विद्युत क्षेत्र को लाभ होगा। हमें VNIT नागपुर के साथ International Analytical Science Congress 2024 का सह-आयोजन करने का अवसर मिला। इसके अतिरिक्त, हमने recycled alloy development, iron removal in recycling, solid-state recycling of aluminium chips, production of 4N pure alumina, and the geo-technological evaluation of bauxite and lateritic deposits पर 05 महत्वपूर्ण परियोजनाएं पूरी की हैं। हाल ही में, हमें खान मंत्रालय द्वारा 07 नई अनुसंधान परियोजनाओं से भी सम्मानित किया गया है, जिनमें उद्योग की भागीदारी और प्रमुख संस्थानों के साथ सहयोग शामिल है। हम सभी हितधारकों को हमारे साथ जुड़ने और हमारे केंद्र में सुविधाओं और विशेषज्ञता का पूरा लाभ उठाने के लिए आमंत्रित करते हैं।

जय हिन्द

डॉ अनुपम अग्निहोत्री

Greetings to all our readers. Welcome to this year's 2nd edition of our newsletter. The aluminium market in 2023 has faced multiple challenges that impacted it prices in various ways. Domestically, aluminium demand is expected to grow by approximately 9% in the upcoming fiscal years. This growth rate is expected to outpace the global demand, which is projected to rise by 1.4% to reach 98.3 million tons in 2024, primarily driven by the transportation sector and the increasing use of aluminium in electric vehicles and packaging.

With a global shift towards a circular economy and sustainability, India is also embracing these principles. In line with this, I am pleased to announce the establishment of a new recycling division at JNARDDC, aimed at promoting recycling and utilizing wastes generated from the non-ferrous metal recycling industry. Additionally, we are actively collaborating with aluminium recycling clusters to establish common dross-treatment facilities. Moreover, under the Ministry of Mines' guidance, we have successfully implemented S&T PRISM 1.0 and 2.0, awarding grants to 15 startups and MSMEs. The first tranche of grants for PRISM 1.0 has been disbursed, and award letters have been issued for PRISM 2.0, with funds to be released soon.

I extend my congratulations to my colleagues for securing a patent on an improved heat treatment process for Al-Zr alloy wire, which will benefit the Indian Electrical sector. We were honored to co-organize the International Analytical Science Congress 2024 with VNIT, Nagpur. Additionally, we have completed 05 significant projects on recycled alloy development, iron removal in recycling, solid-state recycling of aluminium chips, production of 4N pure alumina, and the geo-technological evaluation of bauxite and lateritic deposits. Recently, we have also been awarded 07 new research projects by the Ministry of Mines, all featuring industry participation and collaboration with premier institutions. We invite all stakeholders to engage with us and take full advantage of the facilities and expertise at our Centre.

Jai Hind

Dr Anupam Agnihotri

Industry Connect

S&T PRISM by Ministry of Mines: JNARDDC Leads the Way to Implement PRISM 1.0 and 2.0

JNARDDC, Nagpur, has been appointed as the implementing agency for S&T-PRISM by the Ministry of Mines. The first call of PRISM 1.0 received an encouraging response, with 56 proposals evaluated by the Technical Evaluation Committee (TEC) headed by Dr Agnihotri, Director (JNARDDC). Six proposals were recommended to the multi-ministerial Apex Committee for grants on January 17, 2024. Of these, five were approved by the Apex Committee, chaired by Shri V L Kantha Rao, Secretary, Ministry of Mines. On February 29, 2024, in New Delhi, Shri Pralhad Joshi, Union Minister of Coal, Mines & Parliamentary Affairs, and Shri Raosaheb Patil Danve, Minister of State for Coal, Mines, and Railways, handed over grant letters to the five selected start-ups/ MSMEs. Following the success of PRISM 1.0 and with great enthusiasm to support the recycling sector, PRISM 2.0 was launched on March 1, 2024, receiving 77 proposals. After TEC evaluation, 10 proposals were recommended to the Apex Committee, which approved all of them. On June 24, 2024, in New Delhi, Shri G Kishan Reddy, Hon'ble Union Minister of Coal and Mines, and Shri Satish Chandra Dubey, Hon'ble Minister of State for Coal and Mines, handed over grant letters to the 10 selected start-ups/MSMEs. This initiative marks the first time S&T (Mines) funding has been extended to start-ups and MSMEs, with JNARDDC, Nagpur, leading the effort. This rapid progress demonstrates the ministry and government's determination to promote the mining and recycling sectors, aiming to make India self-reliant (aatma nirbhar) in a sustainable manner.

PRISM 1.0

M/s Cellark Powertech Pvt Ltd, Cuttack, Odisha

M/s LN Indtech Services Pvt Ltd, Bhubaneswar, Odisha

M/s Ashvini Rare Earth Pvt Ltd, Pune, Maharashtra

M/s Caliche Pvt Ltd, Shillong, Meghalaya

M/s Saru Smelting Pvt Ltd, Meerut, UP

TEC Meeting at JNARDDC

PRISM 2.0

M/s Sakshi Chem Sciences Pvt Ltd, Nagpur, Maharashtra

M/s XYMA Analytics Pvt Ltd, Chennai, Tamil Nadu

M/s Greenewelty Pvt Ltd, Bhubaneswar, Odisha

TEC members at JNARDDC for PRISM 2.0

OGPEX Geoscience (OPC) Pvt Ltd, Thane, Maharashtra

M/s Kimberlite Chemicals India Pvt Ltd, Bengaluru, Karnataka

M/s Innocule Materials & Additives Pvt Ltd, Bhubaneswar, Odish

M/s Corrosion Intelligence Pvt Ltd, New Delhi

M/s Lohum Materials Private Limited, Delhi

M/s JAMP INDUSTRIES, Nagpur, Maharashtra

M/s Relira Blastech, Nagpur, Maharashtra

Federation of All India Aluminium Utensils Manufacturers Holds Key Visit to JNARDDC

FAIAUM members in discussion with JNARDDC officials

The Federation of All India Aluminium Utensil Manufacturers (FAIAUM) officials visited JNARDDC, Nagpur on 2nd January 2024, to discuss the rising concerns over usage of aluminium utensils and research collaboration. During the meeting, Shri Brij Mohan Agarwal, President, FAIAUM sought JNARDDC's expertise and assistance in tackling the issue with aluminium utensils. They emphasized that while most recyclers in the organized sector adhere to strict quality standards, it is the unorganized sector with poor infrastructure that releases untested products into the market, harming the industry's reputation. Additionally, both the parties discussed to carry out research aimed at improving efficiency and productivity within the aluminium utensil manufacturing sector.

JNARDDC and Abhitech Energycon Ltd. Collaborate to Promote Innovation

On 14th February 2024, scientists from JNARDDC and the team from Abhitech Energycon Ltd, Mumbai, held a technical interaction at JNARDDC's facilities in Nagpur. The discussion highlighted various industrial challenges faced by Abhitech Energycon Ltd, such as the use of Superabsorbent polymers (SAPs) to remove moisture from bauxite ores, improving their flowability. They also explored the efficient large-scale utilization of red mud.

Abhitech Energycon Ltd shared their Magnetron technology, which offers advantages like expedited drying times, reduced energy consumption, and improved product quality for coal and coke, while reducing moisture levels by approximately 15-20%. The company is keen to leverage JNARDDC's expertise on Aluminium industry-related challenges and progress to pilot plant and production studies.

Abhitech Energycon team at JNARDDC

JNARDDC and LOHUM to Join Hands together for Sustainable Materials and Battery Recycling

On 12th March 2024, Dr Anupam Agnihotri, Director of JNARDDC, along with other Scientists, visited LOHUM's industry unit in Greater Noida, Uttar Pradesh. LOHUM is India's largest producer of sustainable energy transition materials (cobalt, lithium, nickel, etc.) and operates an integrated facility for battery material recycling, reuse, and low-carbon refining. The JNARDDC technical team toured LOHUM's facilities and discussed various collaboration possibilities across diverse product lines. Dr Chidambaram Mandan, Vice President of R&D/QC/Sampling/PD/BD (Materials), organized the interactive meet and plant visits, explaining the stages of battery recycling and materials recovery process. During the interaction, Mr Rajat Verma, CEO of LOHUM, and Gazanfar Safvi, Head of Recycling & Chemicals, highlighted the potential for Government-Private Industry Research Collaboration and expressed LOHUM's keen interest in working with JNARDDC.

LOHUM & JNARDDC officials

YIL- JNARDDC Strengthening Ties for Potential Turnkey Projects

Shri Anjan Kumar Mishra (General Manager) and team from Yantra India Limited, Ambajhari, Nagpur visited JNARDDC on 18th March 2024, to tour its research facilities and discuss potential collaboration in anodizing and extrusion of aluminium alloys. The visit aimed to explore the advanced capabilities at JNARDDC and identify opportunities for joint research and development projects. The collaboration is set to strengthen ties between the organizations and drive forward advancements in aluminium processing technologies.

YIL executives interacting with JNARDDC scientists

JNARDDC Interacted with OMC for Gold Ore Characterization

On 22nd March 2024, officials from JNARDDC visited Odisha Mining Corporation Limited (OMC), Bhubaneswar. Mr Sahoo, General Manager, Exploration, OMC discussed the characterization of gold ore samples with JNARDDC's Scientists. Their primary goal is to harness mineral wealth through exploration and extraction. Dr Upendra Singh from JNARDDC assured him of improved and timely services for the characterization of precious metals.

JNARDDC and OMC Officials

JNARDDC and DGM, Chhattisgarh in Discussions for Innovative Bauxite Research

On 3rd April 2024, a meeting was held at the Directorate of Geology & Mining (DGM), Mineral Resource Department, Government of Chhattisgarh, Raipur. Dr Anupam Agnihotri began the session with an insightful presentation, providing an overview of JNARDDC and its various activities. The JNARDDC scientists highlighted their innovative work in areas such as lateritic bauxite, beneficiation, and research findings from bauxite deposits in Chhattisgarh. The DGM expressed interest in upgrading studies and analyzing different ore samples.

During the session, Shri Sunil Kumar Jain, IAS, Director of DGM, demonstrated a keen interest in mapping critical minerals within lateritic bauxite profiles and other ores. Acknowledging the importance of this collaboration, the DGM proposed drafting a Memorandum of Understanding (MoU) between JNARDDC and DGM to formalize and strengthen future engagements.

JNARDDC team with DGM, Chattisgarh Officials

Advancing Aluminium Extrusion in India: JNARDDC and ALEMAI Sign MoU

On 16th April 2024, JNARDDC and Aluminium Extrusion Manufacturers Association of India (ALEMAI) signed a Memorandum of Understanding (MoU). This MoU establishes a framework for collaboration between the two organizations, aiming to enhance skill development, capacity building, and technical support for the aluminium extrusion industry in India. Key points of the technical collaboration include:

» JNARDDC will organize technical sessions on various topics related to the casting and extrusion of aluminium and its alloys for ALEMAI members.

» ALEMAI and JNARDDC will jointly explore the possibilities of setting up regional laboratories across India with mutual consent.

ALEMAI members' visit to JNARDDC and the MoU signing with Director JNARDDC

International Visit of JNARDDC Scientists

Director Dr Anupam Agnihotri and Dr Upendra Singh, Sr Principal Scientist from JNARDDC, were invited to a knowledge exchange program in the metal and mineral sector for aluminium, organized by Perkin Elmer, Germany during April 2024. The program focused on the use of modern scientific tools such as ICP-MS, OES, and AAS. The program was highly fruitful, offering valuable insights into both R&D and the application of instruments in the characterization of strategic and rare earth minerals found in various geological and metal matrices. The meeting provided essential knowledge on modern techniques and advanced methodologies for real-world applications. Additionally, discussions covered the minimization of downtime, troubleshooting, and maintenance to build confidence and expertise for scientific endeavors. As a part of this program, the officials also made a visit to Humboldt University, Germany.

They also visited the Lukasiewicz Research Network – Institute of Non-Ferrous Metals, Skawina and Gliwice Division, in Poland. The visit aimed to observe pilot plant facilities for critical mineral extraction in Skawina Division and downstream research capabilities in Gliwice. During their visit, the delegation learned about the innovative projects currently underway at the institute and discussed its diverse capabilities. The primary focus of the discussions in Gliwice and Skawina was to explore potential collaborative ventures between JNARDDC and the Lukasiewicz Research Network, particularly in the fields of downstream processing downstream (Gliwice) Mineral Processing (Skawina) of critical minerals. JNARDDC is actively engaging with their scientists to identify potential projects in these areas. Plans are underway to propose a collaborative project, aiming to leverage the strengths and expertise of both organizations for mutual benefit.

Visit at Lukasiewicz Research Network, Skawina Division, Poland

Visit at Lukasiewicz Research Network, Gliwice Division, Poland

JNARDDC Demonstrate its SPL Detoxification Pilot Plant at Circular Economy Workshop by Bureau of Energy Efficiency

On 3rd May 2024, JNARDDC, Nagpur, hosted a one-day Circular Economy Workshop on Spent Pot Lining (SPL) Waste, organized jointly by BEE and JNARDDC. The workshop brought together key stakeholders from the aluminium and cement industries, the Global Cement and Concrete Association (GCCA), the National Council for Cement and Building Materials (NCCBM), and pollution control boards.

The event featured a successful demonstration of a pilot plant equipped with a 25 kg/day SPL detoxification and material recovery unit, complemented by a policy roundtable discussion. The workshop commenced with a welcoming address by Shri S K Khandare, Director of BEE, followed by a keynote speech from Dr Anupam Agnihotri, Director of JNARDDC. Shri M T Nimje, Senior Principal Scientist at JNARDDC, presented and demonstrated the SPL Detoxification unit. The session concluded with a vote of thanks from Shri Vivek Negi, JD of BEE.

The discussion addressed key challenges faced by the aluminium and cement industries, and the workshop ended with a positive response towards adopting this technology to advance a circular economy through SPL waste utilization.

Delegates at JNARDDC during Demonstration of SPL Detoxification Pilot Plant

JNARDDC to aid MPSMCL for Bauxite Analysis

Dr Anupam Agnihotri, Director of JNARDDC, and his team visited MPSMCL in Bhopal on 26th June 2024 to discuss future collaboration in characterization and beneficiation. During the visit, Dr Agnihotri highlighted JNARDDC's extensive expertise in ore and mineral characterization, beneficiation, and sample analysis. Shri Anurag Chaudhary, IAS, Managing Director of MPSMCL, proposed joint efforts on mapping, characterization, and beneficiation of various ore and mineral samples. MPSMCL agreed to send samples of bauxite and other ores to JNARDDC for analysis and finalized a Memorandum of Understanding (MoU) between the two organizations.

MPSMCL team with JNARDDC officials

Meeting with MOIL officials to Discuss Mineral Sample Characterization

Dr Upendra Singh, Head, Analytical Department, visited MOIL and met with Mr P Karaiya, ED (Technical) and Mr R Bhattacharya, Joint GM (Mine Planning), MOIL, to discuss the characterization of Mn Ore using JNARDDC's well-equipped laboratory. MOIL, a Miniratna state-owned manganese ore mining company headquartered in Nagpur, can benefit from JNARDDC's expertise as a premier research laboratory.

JNARDDC Scientist at MOIL

JNARDDC Joins Working Group for Lead in Aluminium by Pure Earth, USA

JNARDDC has partnered with Pure Earth, USA, to address lead (Pb) contamination in aluminium utensils, a pressing environmental and health issue globally. Dr Agnihotri and Mr R N Chouhan from JNARDDC joined a lead working group initiated by Pure Earth, which focuses on identifying and mitigating lead poisoning risks from aluminium utensils. Since joining the working group in April 2024, JNARDDC has actively participated in monthly meetings to identify sources of lead contamination and develop effective solutions. JNARDDC has proposed a project to the Ministry of Mines aimed at addressing lead poisoning in aluminium utensils. The project will focus on identifying the sources of lead contamination and developing methodologies and SOPs for recyclers and manufacturers to effectively remove lead from contaminated aluminium.

In response to this critical issue, Pure Earth has agreed to partially sponsor the project, which will also receive funding from the Ministry of Mines, Government of India. This collaboration is set to enhance the safety and quality of aluminium utensils and contribute to broader efforts in environmental protection and public health.

JNARDDC team in VC with Pure Earth, USA

Asia Ball Beverage Packaging Officials to Collaborate with JNARDDC

A team from Ball Corporation, a leading OEM in aluminium can manufacturing for major beverage companies globally, visited JNARDDC to discuss potential collaboration on scrap sorting and recycling. During their visit, the team engaged extensively with JNARDDC scientists about enhancing the promotion of recycling, improving domestic scrap generation, and establishing efficient scrap collection and processing centers. The focus was on ensuring a steady supply of high-quality scrap for the domestic recycling industry. Both parties are keen to advance this collaboration, with plans to work together on developing indigenous technologies to benefit the domestic aluminium recycling sector.

Asia Ball Beverage Packaging Officials at JNARDDC

Academia Connect

Students from Different Schools and Colleges Gain Hands-On Experience at JNARDDC Lab

A practical visit to an operational lab deepens understanding, enhances critical thinking, sharpens problem-solving skills, and fosters teamwork. JNARDDC's state-of-the-art research laboratory served as a bridge between theoretical knowledge and practical application, offering a refreshing break from textbook learning for students from different schools and colleges. More than 100 students toured the JNARDDC lab and gained firsthand exposure to scientific research. This experience is expected to inspire the students to consider future careers in research and development.

Manohar Municipal High School & Jr. College of Art, Commerce & Science, Gondia

Bhavans Trimurti Nagar

RTMNU Physics department

Sindhi Hindi School, Nagpur

RTMNU chemistry department

Antyoday Mahavidyalay, Devgram, Narkhed, Nagpur

Summer Internship

JNARDDC is always committed to provide opportunities to engineering and science students to gain some knowledge and insights into Aluminium related technologies. In this regard, students from VNIT Nagpur, GH Raisoni College Nagpur, NIT Nagpur, COEP Pune and NIT Rourkela were enrolled for one month summer internship during May to June 2024. Students were enlightened on aluminium production right from bauxite to downstream processing through lectures, presentation and laboratory demonstrations etc.

Summer interns at JNARDDC

JNARDDC Provides Internship to UG and PG Students

The National Education Policy (NEP) 2020 emphasizes the importance of integrating practical experiences into education to enhance employability. It mandates that students at higher education institutions (HEIs) be given opportunities for internships with local industries and businesses, as well as research internships with faculty and researchers at their own or other HEIs and research institutions. In line with this initiative, JNARDDC offered a 15-day internship to UG and PG students. The internship included 120 hours of practical training, featuring hands-on experience with various analytical instruments in the lab.

YCCE, Nagpur

SFS College, Nagpur

Recently Completed Projects

Development of Process for 4N High Pure Alumina (HPA) and Substrate Making for its Validation in LED applications

Sponsor: NALCO, Bhubaneswar

Collaborators: IIT Bhubaneswar, Anna University, Chennai

Principal Investigator: Dr Priyanka Nayar

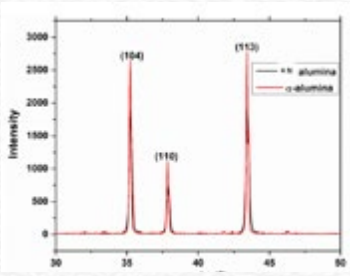
Co-PIs: Mrs Jyoti Pendam, Dr Upendra Singh

Team: Sandeep Kowe, Anirudha Gijare

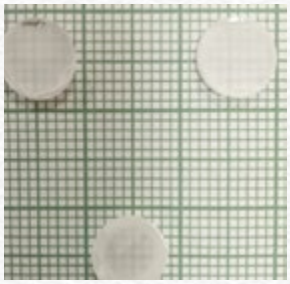
Project Team

In the present work, a detailed study was conducted with three primary objectives: (i) Preparation and optimization of high purity alumina at JNARDDC using the alkoxide method and IIT Bhubaneswar employing the hydrothermal method (ii) to use high purity alumina for sapphire and wafer preparation, followed by validation in LED applications and (iii) Cost benefit analysis of the process for potential commercialization.

JNARDDC successfully prepared high purity alumina (> 99.98 %) using the alkoxide route, while IIT Bhubaneswar explored the hydrothermal method. Both methods resulted in the production of ~ 99.99% pure alumina. However, due to scalability limitations, the hydrothermal process was restricted to laboratory scale. Alkoxide method comprises of steps including (a) Digestion of aluminium metal with iso-propyl alcohol to prepare aluminum isopropoxide (AIP) (b) Double distillation of residue to get pure AIP (iii) Hydrolysis of AIP to get alumina hydrate and (d) calcination of the hydrate to get high pure alumina. IIT BBS used two different solvents viz. hydrazine and ammonia for performing hydrothermal method for the preparation of high pure alumina. The alumina powder prepared at JNARDDC was then utilized by Anna University to fabricate sapphire substrates using Float Zone Crystal Growth Method, which were subsequently validated for use in the LED industry. The draft final report was submitted to NALCO in June 2024.



Comparison of XRD patterns between the prepared alumina and the standard ICDD file for commercial α-alumina


Al_2O_3 wafers (Dia.10 mm and thickness 1.5 mm)

Test Results (ICP-MS) of as-prepared HPA for Purity Compared with Commercial HPA

Product	SiO_2	TiO_2	Na_2O	Fe_2O_3	MnO_2	MgO	ZnO	V_2O_5	Al_2O_3
ALK-57	0.0026	0.0007	0.0020	0.0030	0.0006	0.0003	0.0006	0.0008	99.989
Al_2O_3-Commercial	0.0022	0.0005	0.0003	0.0030	0.0004	0.0003	0.0001	0.0002	99.993

Un-diluted Recycling of Cast Aluminium Alloys Containing High Fe Impurity Suitable for SMEs

Sponsor: S&T (Mines)

Collaborators: BML Munjal University, Gurgaon and Sri Ramakrishna Engineering College, Coimbatore

Principal Investigator: R Anil Kumar

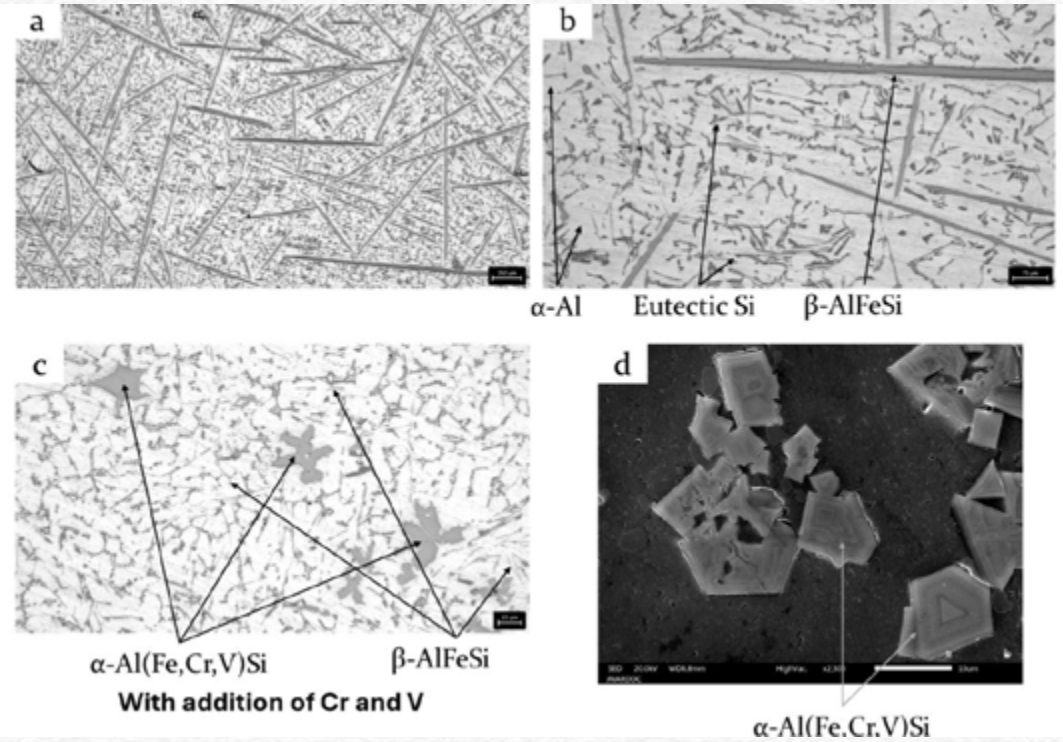
Co-PIs: K Immanuel Raju & R N Chouhan

Team: VNSU V Ammu, Dr Anas N S, Suman Mukherjee

Project Team

The study demonstrated that vanadium, chromium, and molybdenum are effective both individually and in combination, achieving desirable microstructures in newly developed alloys. These alloys now include up to 1 wt% and 2.5 wt% iron, along with other alloy additions. The new alloys exhibit improved wear resistance and high-temperature impression creep compared to conventional base alloys.

Additionally, the use of manganese (Mn) and chromium (Cr) powders as nucleation sites for Fe-containing intermetallics has proven effective in facilitating their sedimentation and removal through filtration. Fabric filters with mesh sizes of 50, 200, and 400 were utilized in these experiments. The research has successfully refined process parameters, such as holding time and temperature, to enhance the practical implementation of Fe removal techniques, paving the way for commercial applications.



Microstructure of (a & b) Al-Si alloy with 2.5 wt% Fe and (c & d) Al-Si alloy with 2.5 wt% Fe and Cr-V additions

Geo-technological Evaluation of Bauxite and Laterite Deposits of Chhattisgarh State by using Geospatial Technology under Smart Mining 4.0

Sponsor: S&T (Mines)

Collaborators: CCOST, Raipur

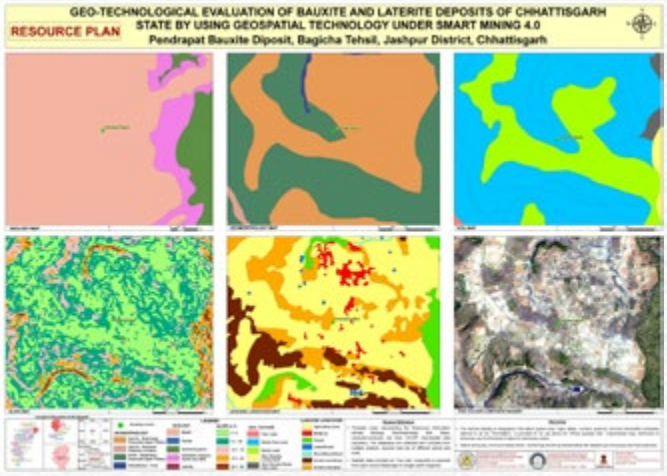
Principal Investigator: Dr P G Bhukte

Co-PIs: Dr Upendra Singh

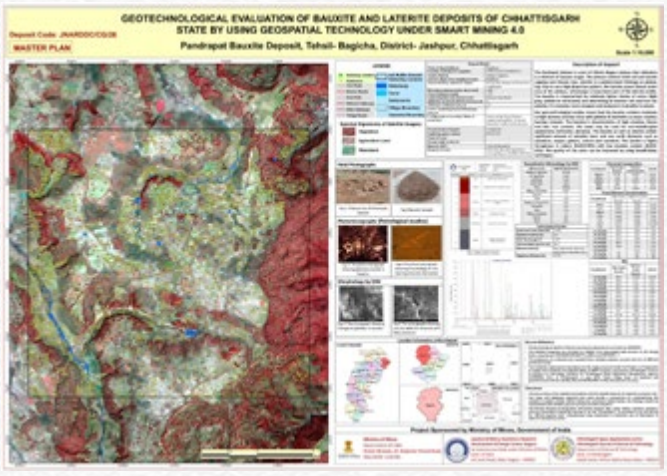
Team: Gopal Daware, K J Kulkarni, Prachi Pradhan

Project Team

The geotechnological assessment of the lateritic bauxite deposits located in Balrampur, Jashpur, Surguja, Kabirdham, Bastar, Kondagaon, Korba, and Kanker in Chhattisgarh State has been completed. Utilizing geospatial technology, the Master plan and Resource plan for each individual deposit have been prepared. These plans provide a plethora of information regarding the applications of bauxite in various industries. The multiple unique outputs, including GeoPDFs, KML files, 3D offline HTML files, and a comprehensive GIS database have generated. These tools enable entrepreneurs to identify deposits suitable for both metallurgical and non-metallurgical applications. The draft final report was submitted to the Ministry of Mines in March 2024.



Resource Plan of Pandrapat Bauxite deposit



Master Plan of Pandrapat Bauxite deposit

Solid-state recycling of Aluminium Chips (waste) for Production of Billets for Pilot Scale Extrusion

Sponsor: S&T (Mines)

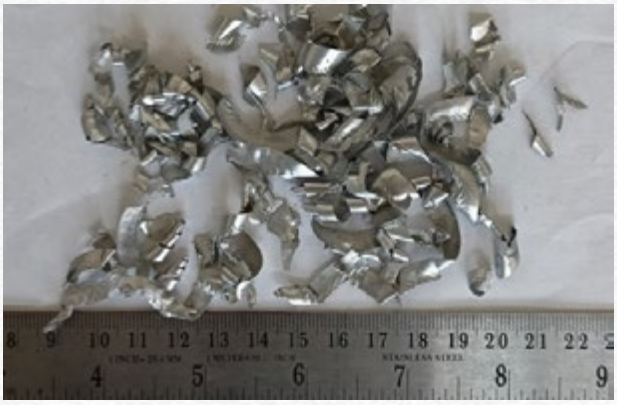
Principal Investigator: Dr Anas N S

Co-PIs: R Anil Kumar

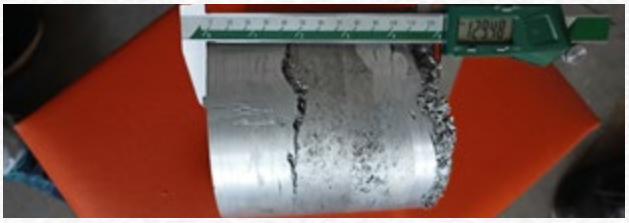
Team: R N Chouhan, V N S U V Ammu, K I Raju, P Waghmare

Project Team

The project explored a novel solid-state recycling process for reusing aluminium chips (swarf) in pilot-scale extrusion. This method aims to develop a sustainable recycling method to replace conventional re-melting processes in the aluminium manufacturing industry. The as-received AA2024 alloy swarf from TASL, Nagpur was cleaned with optimized cleaning solvent acetone. In addition to various compaction experiments at smaller scale, the pilot scale compaction of swarf at hydraulic press of 1400 Ton capacity at JNARDDC helped to achieve billets with density up to 85% of the standard AA2024 density. Extrusion of these billets produced rods with promising mechanical properties comparable to those extruded from commercial billet-casted billets. The cost-benefit and equivalent CO_2 emission analysis indicated approximately 35% and 92% savings respectively, when the billet is produced via solid-state recycling as compared to commercial AA2024 billets. Trials were also conducted using a semi-solid melt combining swarf and base metal extruded butts, followed by extrusion into C-channel profiles. These extrusions exhibited similar properties as those made from commercial billets. Overall, the project demonstrates the feasibility of solid-state aluminium swarf recycling for extrusion, offering potential benefits for resource and cost efficiency, as well as environmental sustainability in the aluminium industry.



As received AA2024 chips



Compacted billet

During extrusion

Extruded rod from Solid state recycled chips

Ongoing Projects (Sponsored by GoI)

Production of Onyx Grade ATH (Sodium Bicarbonate Route) using Low-grade Bauxite from Kutch Region of Gujarat

Sponsor: S&T (Mines)
Collaborators: Kalinga Institute of Industrial Technology, KIIT, Bhubaneswar
Industry Partner: NIKNAM Chemicals Pvt. Ltd.,
Principal Investigator: Dr Suchita Rai
Co-PIs: Dr P G Bhukte, Prachiprava Pradhan,
Team: Amol Mankar, K J Kulkarni, S Yadav, M Panchal

The process is aimed at developing a process know-how for the utilization of inferior-grade bauxite from the Kutch region of Gujarat to produce onyx-grade ATH. In this project, Dawsonite is produced as an intermediate product. Different parameters in various process steps such as digestion, calcination, and leaching were optimized along with the quantity of reagents. A process flow sheet has been developed and component balance has been done. The produced hydrate was validated.

Dr P G Bhukte
Co-PI

Technology Development for Holistic Utilization of Red Mud for Extraction of Metallic Value & Residue Utilization

Sponsor: S&T (Mines)
Collaborators: NML Jamshedpur, CSIR-IMMT Bhubaneshwar
Industry Partner: NALCO, HINDALCO & VEDANTA
Principal Investigator: Dr U Singh
Co-PIs: Dr P Mondi, Dr Priyanka Nayar, Jyoti Pendam
Team: A S Gijare

JNARDDC optimized MGS parameters to enhance REE recovery from red mud, conducting a 100 kg trial. The resulting light and heavy fractions were sent to NML and IMMT for further analysis. Vedanta and Nalco representatives observed the beneficiation process. Final material balance flow sheets for the 100 kg red mud samples were reported, and a comprehensive master flow sheet with mass and energy balances was presented in the techno-economic feasibility studies.

Dr Priyanka Nayar
Co-PI

Fabrication of Al2O3 Containing Cellulose Based Ag NPs Encapsulated Collagen Dressing and Investigation of its Therapeutic Opportunities in Diabetic Wound Healing

Sponsor: S&T (Mines)
Collaborators: Kalinga Institute of Industrial Technology, Bhubaneshwar
Principal Investigator: Dr Suchita Rai
Co-PIs: Prachi Pradhan
Team: Mr Amol Mankar, K J Kulkarni, M Panchal, S Bagde, S Yadav & K Janbandhu

The process aims at the fabrication of Al2O3-containing cellulose-based AgNps encapsulated collagen dressing and the investigation of its therapeutic opportunities in diabetic wound healing. In this project, high-purity bioceramic grade alumina has been developed at JNARDDC and is utilized by KIIT, Bhubaneshwar for its application in preparing the collagen dressing which would be used for wound healing in diabetic patients.

K J Kulkarni
Team member

Development of Low-cost Filler Material Utilizing Lithomargic Clay for Paint Industry as per IS 68 2006 Standard

Sponsor: S&T (Mines)
Industry partner: Mundle Paint (Mundle Colour Coat), Bhandara (M S)
Principal Investigator: Dr P G Bhukte
Co-PIs: Dr Mohamed Najar
Team: Gopal Daware, Kiran Janbandhu, Vinod Kshirsaut

Lithomarge clay was characterized by its high silica and low alumina content. Representative samples of lithomarge clay collected from bauxite mines have been characterized, and beneficiation studies (including gravity concentration and leaching) have been conducted to improve its quality and brightness. Trials are currently in progress in the paint industry using the prepared material (lithomarge clay and additives) at the JNARDDC lab.

Kiran Janbandhu
Co-PI

Development of Prototype Aluminium Seat Frame for Passenger Buses

Sponsor: S&T (Mines)
Collaborators: Automotive Research Association of India, Pune
Principal Investigator: VNSU V Ammu
Co-PIs: Dr Anas N S
Team: K Immanuel Raju, R N Chouhan

ARAI identified and studied the feasibility of a seat frame using six extruded profiles, with designs shared with JNARDDC. JNARDDC carried out die design and simulation studies for these profiles, which will be extruded using an AA6xxx series alloy on their 14 MN extrusion press. Some profiles were designed with multiple openings to reduce extrusion load and ease shopfloor implementation. The dies are currently being fabricated, and once completed, the profiles will be extruded and sent to ARAI for testing and prototyping. JNARDDC also plans to upgrade its extrusion press with a 100-ton hydraulic stretcher to achieve the required temper.

VNSU V Ammu
PI

Red mud Valorization to Achieve Zero Waste Conversion of Residue into Diagnostic X-ray shielding Tiles after Recovery of Scandium

Sponsor: S&T (Mines)
Collaborators: CSIR-AMPRI, Bhopal
Principal Investigator: Dr Upendra Singh
Co-PIs: Dr P Mondi, Dr Priyanka Nayar, Jyoti Pendam
Team: A S Gijare, S Kowe & K Janbandhu

The XRF analysis of un-sintered and sintered red mud based sample was performed to know wt% of Fe2O3, TiO2, Al2O3 etc., present in the sample. The SEM analysis and elemental mapping was also done to understand the morphology and uniform distribution of major elements like Fe, Ti, Al, Si, Na and O. The ICP-OES analysis was performed to know the leaching of heavy elements like Pb, Cr, Cd, As and Hg.

Dr Upendra Singh
PI

Development of DC Cast Al Alloy for Yoke in Automobile Applications

Sponsor: NALCO, Bhubaneswar
Collaborators: Automotive Research Association of India, Pune
Principal Investigator: VNSU V Ammu
Co-PIs: K Immanuel Raju, R N Chouhan, Dr P Mondi
Team: R Anil Kumar, Dr Anas N S, P Waghmare, S Mukherjee

Dr P Mondi
Co-PI

JNARDDC has identified and optimized two chemical compositions for the yoke applications in lab scale. Also, the process parameters for casting, homogenization, forging and ageing and solutonizing were optimized. In this regard, pilot scale DC casting trials will be taken up shortly.

Kinetic Study of Different Unit Operations Like Digestion, Desilication

Sponsor: NALCO, Bhubaneswar
Principal Investigator: Dr Suchita Rai
Co-PIs: Prachiprava Pradhan, Amol Mankar, K J Kulkarni, M Panchal
Team: Dr Md Najar, Dr P Mondi, K Janbandhu, S Yadav

The project focuses on studying the desilication and digestion kinetics of bauxite from NALCO's Damanjodi,

Dr Suchita Rai
PI

Odisha. Preliminary desilication studies at different slurry concentrations and temperatures led to a rate equation for desilication kinetics. The digestion study is ongoing, using pre-desilicated bauxite and a blend of ROM and desilicated bauxite. The results will be utilized in SYSCAD software by NALCO.

Detailed Thermal / Heat Balance Study of the Cast House Furnaces to Increase Furnace Efficiency

Sponsor: NALCO, Bhubaneswar
Principal Investigator: V K Jha
Co-PI: M T Nimje, S K Thokal, K Immanuel Raju
Team: R N Chouhan

The software development for the furnace's energy balance is complete and will be fine-tuned for

S K Thokal
Co-PI

Nalco's casthouse furnace. During a site visit, two furnaces were selected for data collection, including thermal images, furnace schematics, refractory specifications, furnace oil analysis, and operational parameters. Data analysis is ongoing, focusing on calculating heat losses to determine energy efficiency, as the direct method is not applicable.

Recycling Coal Mine Overburden to Reuse as a Value-Added Building Material to Promote a Circular Economy

Sponsor: Ministry of Coal, Gov. of India
Collaborators: VNIT Nagpur, BIT Mesra, CMPDIL Dhanbad
Principal Investigator: Dr Md Najar
Co-PIs: M T Nimje, Dr Upendra Singh, K Janbandhu
Team: Dr Paparao Mondi, Shweta Naik

M T Nimje
Co-PI

The project work achieved significant progress in the conversion of crystalline Coal Mine Overburden (CMO) into hardened geopolymer matrix, suits for constructing structural and nonstructural building elements. At the initial stage, the geopolymer blocks prepared at low alkali concentration reported compressive strength 8-13 MPa. Preparation of different grades of concrete using CMO based geopolymer paste is currently in progress.

Development of Medium Strength Al-Mg-Si (AA6082 based) Alloy for High end Strategic Applications

Sponsor: S&T (Mines)
Collaborators: IIT Gandhinagar
Industry partner: Siddhi Engineers, Ahmedabad
Principal Investigator: K Immanuel Raju
Co-PIs: R N Chouhan & V N S U V Ammu
Team: R Anil Kumar, Dr Anas N S, P Waghmare

R N Chouhan
Co-PI

Extrusion trials on existing AA6082 billets have been completed, and the extrudates are undergoing various heat treatments and mechanical property evaluations. Melt trials are also in progress, experimenting with different Zirconium (Zr) and Chromium (Cr) compositions, alongside heat treatment optimizations. A PEB shed is being constructed to house a lab-scale billet casting system, which will be used for final melt trials once optimal alloy compositions are identified.

New Projects

Coal Mine Overburden Alkali-activated Composites (CMOAAC) for Pre-Fabricated 3D Volumetric Construction Elements & System thereof (3DVCES)

Sponsor: Ministry of Coal, Gov. of India
Collaborators: VNIT Nagpur, IIT BHU, CMPDIL Dhanbad
Principal Investigator: Dr Mohamed Najar P A
Co-PIs: Dr Paparao Mondi, Dr P G Bhukte, Dr Upendra Singh
Team: Dr Priyanka Nayar, Jyoti Pendam, K Janbandhu

The key objective of this project is to explore the use of overburden material obtained from coal mines in the construction of earthquake resistant and durable

Dr Mohamed Najar P A
PI

infrastructure through 3D printing technique. The project also intends to improve durability of geo-polymer-based superstructure and foundation against chloride attack, sulphate attack, carbonation and harsh environments. The application domains are affordable mass housing and post-disaster rehabilitation in seismic prone regions of India through experimental and numerical investigation.

Process for Production of ATH with High Whiteness using Non-metallurgical Grade Bauxite by following Soda Sintering Process

Sponsor: S&T (Mines)
Collaborators: Institute of Chemical Technology (ICT) Mumbai Indian Oil Campus Bhubaneswar
Industry partner: NIKNAM Chemicals PVT Ltd
Principal Investigator: Prachiprava Pradhan
Co-PIs: Dr Suchita Rai, Amol Mankar, K J Kulkarni, M Panchal
Team: Dr U Singh, P G Bhukte, S Yadav

The project's goal is to produce alumina hydrate with a high whiteness by systematically evaluating each step of the process and ensuring the product's quality and

Prachiprava Pradhan
PI

consistency. Major objective is to develop the process know-how for production of alumina hydrate with high whiteness from non-metallurgical grade bauxite. Scale up study will be conducted based on the laboratory investigations in order to produce alumina product hydrate and evaluate its properties. This scale up study will be done to replicate the laboratory scale results on a larger scale to assess its feasibility. At the end, the product validation and overall mass balance would be done for each step of the process.

Performance Evaluation and Dosage Optimisation of CGM

Sponsor: Kimberlite Chemicals Pvt limited, Bengaluru.
Principal Investigator: Amol Mankar
Co-PIs: Prachiprava Pradhan, Dr.Suchita Rai
Team: M. Panchal, K. J. Kulkarni, Mr. Amar Padole

The study has been successfully completed for the evaluation of CGM under NALCO plant conditions. The study was meticulously designed to assess the impact of Crystal Growth Modifiers (CGMs) on liquor productivity, particle size, and soda content of product hydrate, simulating the NALCO Damanjodi plant precipitation circuit. Samples of liquor and seed were directly sourced from the NALCO Damanjodi plant to ensure relevance and applicability.

In this comprehensive study, we evaluated two newly developed CGMs, AL Flow 301 and AL Flow 302, along with a competitor CGM. The addition of CGM at the agglomeration stage significantly enhanced particle coarsening and

Amol Mankar
PI

boosted liquor productivity while maintaining acceptable soda content. The study identified the optimal dosage of Crystal Growth Modifiers (CGM) for use under NALCO plant precipitation conditions. Key findings indicate that a CGM dosage of 100 ppm is optimal for both AL Flow 301 and AL Flow 302. Importantly, the addition of CGM did not adversely affect the soda content of the product hydrate, which remained within acceptable limits.

Comparatively, the competitor CGM requires a significantly lower dosage of 25 ppm, demonstrating better coarsening and higher liquor productivity than the new products. Overall, the study highlights the potential of CGM AL Flow 301 and 302 to significantly enhance the efficiency and output of precipitation processes, offering a promising solution for similar industrial applications. The final report has been submitted to Kimberlite Chemicals Pvt. Limited.

An Optimal Approach for the Retrieval of Value-added Substances from Secondary Aluminum Black Dross

Sponsor: S&T (Mines)
Collaborators: Sri Ramakrishna Engineering College, Coimbatore
Industry partner: Phoenix Alloys, Coimbatore
Principal Investigator: K Immanuel Raju
Co-PIs: V N S U V Ammu, R Anil Kumar
Team: R N Chouhan, Dr Anas N S, S Mukherjee, P Waghmare

This project focuses on the development of hybrid pyro-hydrometallurgy techniques to extract high-

K Immanuel Raju
PI

quality alumina and other valuable components from secondary aluminium dross. By maximizing the recovery of these materials, we aim to enhance resource efficiency and sustainability in the aluminium industry. Additionally, the project seeks to convert aluminium dross into flux, serving as a degassing agent for industrial applications.

Publications

Research Papers

» Innovative Technologies for Recycling and Extraction of REE, Pratik Godbole, Kaustubh Deshpande, Sanjeevani Jawadand, M L Dora, Atul Selokar, Gopal Daware, Manoj Sahu, Ashok Kumar Nandi, Kirtikumar Randive. Springer Proceedings in Earth and Enviornmental Sciences (SPEES).

» Beneficiation and Extraction of Strategic Scandium (Sc) from Aluminium Industry Waste Residue, Upendra Singh, Jyoti Pendam, Sonali Thawrani, Mayur Tirpude, Anupam Agnihotri. Springer Proceedings in Earth and Enviornmental Sciences (SPEES).

» Characterization and Beneficiation of Pyrophyllite, P G Bhukte, G T Daware, M J Chaddha, T P Bhosale, A Agnihotri, Springer Proceedings in Earth and Enviornmental Sciences (SPEES).

» Potential Application of Red Mud in Cement: An Indian Perspective, Suchita Rai, M J Chaddha, Prachi Pradhan, K J Kulkarni, M Panchal, A Agnihotri, Springer Proceedings in Earth and Enviornmental Sciences (SPEES).

» Commercial and Technical Prospects of Unused Mineral Values of Aluminium Industry, Mohamed Najar, Pravin Bhukte, Upendra Singh, Manoj Nimje, Anupam Agnihotri, Springer Proceedings in Earth and Enviornmental Sciences (SPEES).

» Process for Recovering Silica from Lithomarge Clay: Value Addition of Unexploited Mining Rejects, Mohamed Najar, Amrita Karn, Paresh Nageshwar, Pravin Bhukte, Mukesh Chaddha, Anupam Agnihotri, Journal of Chemical Technology and Metallurgy; 59(1) 2024,129-36, Sofia, Bulgaria.

Conference Paper

» Utilizing XRF for Chemical Analysis of Minerals and Ores, Priyanka Nayar, Anirudha Gijare, Upendra Singh, Anupam Agnihotri, International Analytical Science Congress 2024(IASC-2024), VNIT, Nagpur, 22-24 Februray 2024.

» Alumina (Al2O3) as Advanced Material: Its Application in BIOCERAMICS', Suchita Rai, Prachiprava Pradhan, Amar Padole, Anupam Agnihotri, at Chemix'24, 6-7 April 2024, 7th National Conference on Intra- and Inter-Disciplinary Blend of Chemical Engineering, organized by IIChE Students' Chapter, Department of Chemical Engineering, VNIT Nagpur in association with IIChE, Nagpur Regional Centre.

» Perspective of Sustainable Process Development for the Recovery of Rare Earth Elements from Aluminium, Shweta Dhamande, International Conference on Advanced Sustainable Futuristic Material, Kamla Nehru Mahavidyalaya, Nagpur, 26-27 April, 2024.

» International Conference on Powder Metallurgy & Particulate Materials (PM-24), Pune 25-28th February 2024. Developing a Process for Producing Pilot-Scale Extrusion Billets from Machined Aluminium Alloy Swarf: A Step Towards Sustainable Aluminium; N S Anas, K N Ramteke, R A Kumar, VNSU V, Ammu, R N Chouhan, A Agnihotri, R Radhakrishnan.

Invited Lecture

» Trending Climate-Friendly Innovations in Steel and Aluminium, Dr Anupam Agnihotri, National Green Metal Conference (NGMC-2024), hosted by the State Pollution Control Board and Biju Patnaik National Steel Institute during February 6-7, 2024.

» Heat transfer and energy saving potential in Bayer's process for alumina production; Suchita Rai at Dept. of Chemical Engineering VNIT, Nagpur on 2nd February 2024.

» Lateritic Bauxite deposits, technological characteristics and beneficiation; Pravin Bhukte, during ''Refresher course on LiDAR and drone surveys in Geoscientific studies'' organised by GSI, CR, Nagpur during April 22-27, 2024.

» Value Added Use of Metallurgical Solid Rejects: Less Explored sources in Sustainable Construction; Mohamed Najar, Short term Training Programme on Value Addition in Aggregates Sourced from Industry Rejects for Sustainable Construction, Department of Civil Engineering, VNIT Nagpur during 24-28 June 2024.

Patent Granted

» An improved heat treatment process for production of heat-resistant Al-Zr alloy wire for overhead conductor, R N Chouhan, VNSU V Ammu, S Mukherjee, A Agnihotri; Patent No: 533417 Date of grant: 17-04-2024.

JNARDDC News

Hon'ble Ministers Shri G Kishan Reddy and Shri Satish Chandra Dubey Awards Sanction Letters under S&T-R&D Scheme

Utilisation of aluminium dross in synthetic slag preparation for secondary steel making

JNARDDC Nagpur & VNIT with Daiki Aluminium (India) Pvt Ltd., Andhra Pradesh

Triazine Derived g-C3N4 Based Separation of Niobium and Tantalum from the Tin Slag- AFully Scalable Fluoride-Free Process

JNARDDC, BHU Varanasi with LOHUM, Greater Noida

Lead contamination in recycled aluminium cookware-Identifying sources and developing strategies for lead removal

JNARDDC Nagpur with Pure Earth, New York, USA

Conformal Cooling strategies for minimizing Peripheral Coarse Grain growth in High-Strength Aluminium alloy extrudates

JNARDDC with Bharat Forge, Pune

Extraction of Gallium from Titanium and Iron ore Industrial wastes

CSIR-NIIST Thiruvananthapuram & JNARDDC with V.V. Titanium Pigments Pvt. Ltd., Tamil Nadu

Recovery of Nickel from Secondary Steel Industry waste

JNARDDC with Hydromet Research and Recovery LLP, Maharashtra

Sustainable Manufacturing of automobile engine pistons with 100 percent recycled aluminium alloys with extended Fe-impurity tolerance

BML Munjal University, Gurugram & JNARDDC with Motocast Power Alloys Private Limited, Rajasthan

63rd Central Geological Programming Board Meeting Held in Bhopal; JNARDDC Discusses Future Collaboration

The 63rd Central Geological Programming Board (CGPB) meeting was held on January 22, 2024, at the Kushabhau Thakre International Convention Centre (Minto Hall) in Bhopal. The meeting was chaired by Shri V L Kantha Rao, Secretary (Mines), and attended by Shri Pralhad Joshi, Hon'ble Union Minister of Coal, Mines & Parliamentary Affairs, and Dr Mohan Yadav, Hon'ble Chief Minister of Madhya Pradesh. Other participants included stakeholders from the mining and exploration sectors, along with the Principal Secretary, Additional Secretary (Mines), and State DMGs/DGMs from various Mining States.

The meeting aimed to finalize the Geological Survey of India's (GSI) annual program and to coordinate and enhance geoscientific activities across the country, with GSI serving as the nodal department and State Geology and Mining departments and Central Government Institutions as participating members. Dr Anupam Agnihotri represented JNARDDC and engaged in productive discussions with several stakeholders. The MP State Mining Department also expressed interest in establishing a long-term MOU with JNARDDC for bulk sample analysis.

Director, JNARDDC with other delegates at CGPB Meeting

गणतंत्र दिवस समारोह

जेएनएआरडीडीसी में २६ जनवरी २०२४ को ७५वां गणतंत्र दिवस राष्ट्रीय तिरंगा ध्वजारोहण के साथ मनाया गया। निदेशक महोदय ने इस अवसर पर इस दिन के महत्त्व पर प्रकाश डालते हुए कर्मचारियों को केंद्र की विभिन्न उपलब्धियों और भविष्य की योजनाओं से अवगत कराया।

जेएनएआरडीडीसी में गणतंत्र दिवस समारोह

JNARDDC Successfully Completes NABL Surveillance Audit for ISO 17034:2016 Accreditation

During February 20-21, 2024, a team from NABL conducted a one-year surveillance audit at JNARDDC, which is accredited with ISO 17034:2016 for manufacturing spectrochemical certified reference materials (CRMs) for aluminum alloy analysis through spark OES. During the audit, JNARDDC's production of four alloy grade CRMs—AA 6063, 3103, 7075, and 2024—was reviewed. Additionally, the APAC team visited alongside NABL to assess the audit process. JNARDDC was honored to be selected by NABL for this audit, underscoring the institute's commitment to maintaining high standards in its certification processes. Post-audit, JNARDDC successfully addressed all minor non-conformities raised by the audit team, enhancing the robustness and efficiency of their processes.

Officials during NABL Surveillance Audit

International Analytical Science Congress 2024

The International Analytical Science Congress 2024 (IASC-2024), organized by ISAS and JNARDDC from February 22-24, 2024, was inaugurated at the VNIT Auditorium. The event was graced by Chief Guest Shri Paradip Mukherjee, CEO of BRIT, and Guest of Honour Dr B Sarvanan, Director of AMD, alongside Dr Raghav Saran, President of ISAS, Dr A Agnihotri, Director of JNARDDC, Prof P M Padole, Director of VNIT, and Dr Rajesh S Pande, Principal of RCOEM.

Co-organizers included VNIT, RCOEM, ISRA, BARC, NEERI, and TIFR. The congress featured interactive discussions with scientists and researchers from across India and international participants from Oman, Singapore, and other countries. Topics covered included modern analytical techniques in agriculture, space technology, pesticides, food and food adulteration, geological materials, metallurgy, mining, mineral processing, petroleum refining, chemical and petrochemical industries, pharmaceuticals, fine chemicals, forensics, biotechnology, nanotechnology, miniaturization, automation, robotics, and AI.

Several awards were presented to recognize achievements in various categories, with a special focus on motivating women and young scientists. Dr Anupam Agnihotri received the prestigious ISAS - Dr Raja Ramanna Award 2023, while Dr U Singh, Head of the Analytical Division at JNARDDC, was honored with the ISAS Analytical Scientist of the Year 2023 award. Additionally, Dr Paparao Mondi, Scientist, JNARDDC was awarded the best paper award at IASC-2024.

Highlights from IASC-2024

JNARDDC Took part in UK-India Critical Minerals Intergovernmental Workshop

At the UK-India Critical Minerals Partnership Workshop & Conference, held from February 26-28, 2024, at the KIIT-TBI Campus in Bhubaneswar, the Director of JNARDDC presented a comprehensive overview of India's critical minerals landscape. The presentation covered India's policies aimed at promoting critical mineral exploration, mining, and extraction technologies. This workshop, organized by KIIT TBI, CPI, and BCKCI, aimed to foster research, innovation, and policy insights on critical mineral exploration and extraction, while exploring business opportunities for both nations. The event, held at the Technology Business Incubator in Bhubaneswar, focused on critical mineral policy, extraction methods, and emerging technologies, with the goal of building a collaborative UK-India community of academics, innovators, and industry leaders to address challenges and seize commercial opportunities in the sector.

Director, JNARDDC presenting his talk on Critical Minerals

JNARDDC Hosts Annual Health Check-Up Camp in Collaboration with Lok Kalyan Diagnostics

On March 11, 2024, JNARDDC, in collaboration with Lok Kalyan Diagnostics, Nagpur, hosted an annual health check-up camp at its premises. Approximately 51 employees participated in the health screening, which included tests such as CBC, serum cholesterol, RBS, serum creatinine, ECG, and thyroid. Consultations were provided by renowned doctors from Meditrina Hospital, Nagpur.

Health Check-Up Camp at JNARDDC

7th Joint Monitoring cum Steering Committee Meeting on Red Mud Utilization Held at CSIR-IMMT Bhubaneswar

On April 4, 2024, the Director of JNARDDC attended the 7th Joint Monitoring cum Steering Committee Meeting for the Technology Development for Holistic Utilization of Red Mud Project, held at IMMT, Bhubaneswar. Dr Upendra Singh represented JNARDDC in the meeting. The Director of IMMT welcomed the committee members and emphasized the significance of addressing red mud as bauxite residue and the growing demand for rare earth elements (REEs). Shri R Saravanabhavan initiated the discussion by reviewing the current status and outlining a concrete roadmap for achieving the project's goals. Committee members from participating institutes presented their progress. The meeting concluded with plans for an online discussion scheduled for the first week of July 2024.

Delegates during the meeting

Dr Anupam Agnihotri Inaugurates International Conference at Wainganga College

Dr Agnihotri graced the inaugural function of the International Conference on Innovation in Engineering Science and Management (ICIESM-2024) as the Chief Guest which took place on 6th April 2024, at Wainganga College of Engineering and Management (WCEM), Nagpur. The conference successfully brought together experts and scholars in the fields of engineering, science, and management to discuss and explore innovative ideas and advancements in the areas of smart electrical systems, big data, high-performance computing, IoT, e-governance, etc.

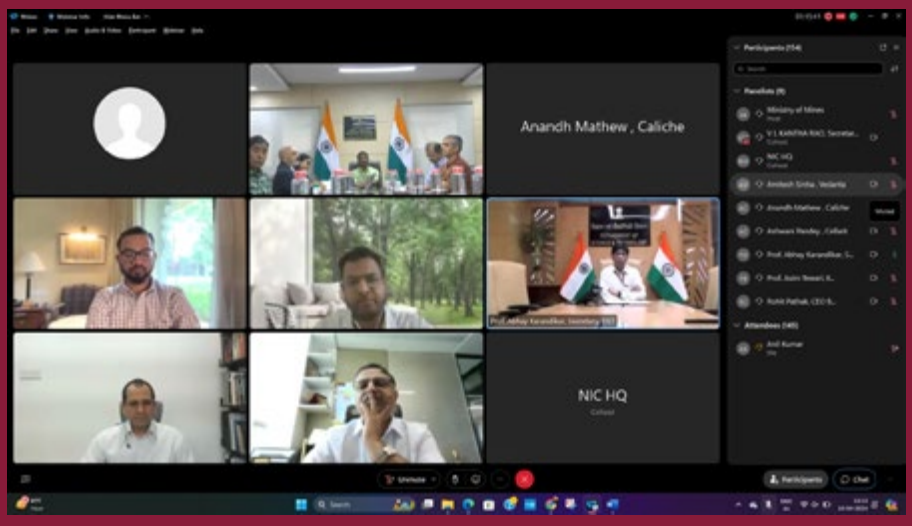
Dr Anupam Agnihotri during the inauguration

Ministry of Mines Hosts Mining Startup Webinar: Opportunities and Innovations in the Sector

On April 10, 2024, the Ministry of Mines hosted a Mining Startup Webinar, chaired by Shri V L Kantha Rao, Secretary (Mines), and attended by Prof Abhay Karandikar, Secretary (DST), along with several other distinguished speakers.

The Secretary highlighted the increasing role of startups in the mining sector and the focus on expanding opportunities and funding, particularly due to the importance of processing and recycling critical minerals. He encouraged participants to explore new opportunities, engage with industry leaders, and address the challenges of processing extensive geological data to locate mineral resources.

Ms Farida M Naik, Joint Secretary (Mines), and Dr A Agnihotri, Director of JNARDDC, informed attendees about the PRISM 2.0 proposal invitations. The Ministry of Mines will allocate substantial funds to support startups and MSMEs in the sector.



Secretary, Mines and other officials during the webinar

Additional speakers included Mr Amitesh Sinha, Vice President & Head of Corporate Venture Capital & Vedanta Spark at Vedanta; Mr Rohit Pathak, CEO of Birla Copper; Mr Ashwani Pandey of Cellark Technologies Ltd; Mr Anandh Mathew of Caliche Ltd, Shillong; and Prof Asim Tewari from IIT Bombay. Shri R N Chouhan, Member Secretary of TEC, conducted the Q&A sessions. The webinar saw active participation from around 200 delegates.

JNARDDC Celebrates 35th Foundation Day with Milestone Achievements and Future Prospects

On April 16, 2024, JNARDDC, Nagpur, celebrated its 35th Foundation Day, marking a significant milestone in its journey of advancing aluminum research and development. Established by the Ministry of Mines, JNARDDC has been a leader in innovation and technology in the aluminum industry.

The event was graced by dignitaries Shri Indra Dev Narayan, CMD of MECL, and Shri Pankaj Kumar, General Manager of QC at SECL, who highlighted the Center's achievements and future prospects. Dr Anupam Agnihotri, Director of JNARDDC, reviewed the Center's 34-year history of progress and its role in fostering innovation through programs like S&T-PRISM.

The celebration included a Mining, Mineral & Recycling Startup Bootcamp showcasing entrepreneurship insights from leading experts and entrepreneurs. A MOU was signed with the Aluminium Extrusion Manufacturers Association of India (ALEMAI) to promote collaborative R&D.

Notable speakers included Shri Ashwani Kumar Pandey, Shri Ashutosh Kumar, Dr Suhas Buddhe, Dr Sunil Bhat, and Mr Brabasuthan Murugesan. Awards for technical excellence were presented to Mr R N Chouhan, Dr U Singh, Dr P G Bhukte, Dr Suchita Rai, Dr Md Najar and Mr Nitin Warhadpande.

The event was expertly conducted by Shri Immanuel Raju and hosted by Mrs R Vishakha, with a closing vote of thanks by Mr M T Nimje.

Employee of the Year 2023-24' at JNARDDC

During the Foundation Day program on April 16, 2024, Mr Nitin Warhadpande (Sr. Scientific Officer-II and CTSC Head) was honored with the Employee of the Year 2023-24 award for his exceptional dedication and nearly 29 years of service to JNARDDC. As the leader of the Consultancy & Testing Cell, Mr Warhadpande played a crucial role in securing NABL accreditation for the Centre.

Director, JNARDDC felicitating Mr Warhadpande

Ministry of Mines Officials Field and Lab Visits to Enhance Capacity Building

In 2023-24, senior officials from the Ministry of Mines, including ASOs, Section Officers, Consultants, Under Secretaries, and Directors, continued their field and lab visits. These officials visited JNARDDC, GSI, and the Gumgaon mines of MOIL. This initiative aims to provide officers with firsthand experience at the Ministry's office sites and enhance their Annual Capacity Building Plan (ACBP) through on-site exposure to labs and mines. The tours, which included four batches of 10 officials each, took place on April 25, May 1, 8, and 15, 2024.

Officials from different batches during lab visit at JNARDDC

Capacity Building Lecture Series at JNARDDC

As part of the Annual Capacity Building Program, Shri Ramdeobaba College of Engineering and Management, Nagpur, conducted a comprehensive lecture series and training program on 22nd May 2024. The program covered four key modules for a batch of 25 participants, including: (i) Project Management, (ii) Effective Communication Skills for Interacting with Superiors, Colleagues, and External Customers, (iii) Six Sigma, and (iv) Industry 4.0. All the scientific staff of JNARDDC attended the programme positively.

JNARDDC officials attending the lectures

Ministry of Mines PERC Meeting at JNARDDC

The Ministry of Mines invited project proposals from academic institutions, universities, national institutes, and R&D organizations in key areas impacting the mineral sector, mining sustainability, and industrial applications through announcement no. Met4-14/6/2024(R&D) dated March 1, 2024. Out of 210 proposals submitted online, 40 were shortlisted by the preliminary scrutiny committee for review by the Project Evaluation and Review Committee (PERC). This PERC review meeting, held at JNARDDC, Nagpur on 14th June 2024 was chaired by Ms Farida Naik, Joint Secretary (Mines) and Chairperson of PERC. JNARDDC provided an ideal venue with state-of-the-art infrastructure for the hybrid meeting. Ultimately, 27 projects were recommended for approval by the SSAG.

PERC members during the meeting

JNARDDC and VNIT Nagpur Sign MoU

Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur, and Visvesvaraya National Institute of Technology (VNIT) Nagpur have signed a Memorandum of Understanding (MoU) to foster technical cooperation in scientific research and development. JNARDDC, a Centre of Excellence under the Ministry of Mines, has been recently appointed as the implementing agency for the PRISM scheme to support Startups and MSMEs. VNIT, recognized as an academic institution of national importance, along with other NITs, plays a key role in shaping the future of India's youth. This MoU will facilitate active collaboration between students, faculty, and researchers, aiming to advance scientific and technological developments in the mineral and metal sector, including areas such as recycling, circular economy, and critical minerals. The agreement was signed by Dr Anupam Agnihotri, Director of JNARDDC, and Dr Pramod M Padole, Director of VNIT, in the presence of the Heads of Departments from both institutions.

Dignitaries during MOU Signing

अंतरराष्ट्रीय योग दिवस २०२४

२१ जून २०२४ को जेएनएआरडीडीसी में अंतर्राष्ट्रीय योग दिवस स्वयं और समाज के लिए योग' थीम के साथ मनाया गया। इस वर्ष की थीम योग को एक ऐसे अभ्यास के रूप में उजागर करती है जो सभी को जोड़ता है और एकजुट करता है । योग मुद्राओं का जाल बुनते हुए कर्मचारियों की एक सामूहिक सभा बुलाई गई। केवल भौतिकता से परे, यह अभ्यास कल्याण की दिशा में एक साझा यात्रा और योग के असंख्य लाभों के प्रसार का प्रतीक है।

जेएनएआरडीडीसी में अंतर्राष्ट्रीय योग दिवस २०२४

Annual Sporting Event 2023-24

The annual sporting events commenced from Dec 2023 culminated in Feb 2024. The management believes that a fit body is the home for a fit mind. The one month long event covered badminton, table tennis, carrom, and cricket. Most of the employees and staff participated in the various sporting activities. The events certainly brought freshness to the minds of JNARDDC employees.

Sports Inaugration

JNARDDC's Employees Completed iGoT Karamyogi Courses

All the 51 employees of JNARDDC have been registered on iGOT platform and they have completed their earmarked courses as per CNA. Furthermore, they have also undergone the 6 (Six) courses mandated by DoPT comprising of :-

- Code of conduct for Government Employees.
- Prevention of Sexual harassment of Women at workplace.
- Introduction of Emerging Technologies.
- Yoga Break at workplace.
- Orientation Module on Mission Life.
- Stay safe in Cyber Space.

JNARDDC Celebrates International Women's Day 2024 with Emphasis on UN Theme

International Women's Day 2024 was celebrated at JNARDDC with various activities. The event featured an audiovisual presentation about International Women's Day on the main digital screen. The Director addressed the female staff in the office canteen, highlighting this year's United Nations theme, 'Invest in Women: Accelerate Progress,' which focuses on addressing economic disempowerment. Currently, women make up approximately 25% of the total staff, a number expected to grow with ongoing efforts in women empowerment.

Women's Day Celebration

Ex-Member of Parliament Shri Kirit Somaiya Visits JNARDDC

Shri Somaiya at JNARDDC Campus

Shri Kirit Somaiya, a two-term Member of Parliament for Mumbai NE and Vice President of BJP, visited JNARDDC and met with the Director to discuss various issues, including sustainable development in the metal sector. During his visit, he also participated in a plantation program.

JNARDDC Wins 1st Place in Swachhata Pakhwada Awards

JNARDDC conducted a special cleanliness campaign across all labs and office premises as part of the Swachhata Pakhwada conducted in October 2023. The initiative aimed to foster enthusiasm for cleanliness and was carried out under the Swachh Bharat Mission (SBM). The activities included:

- Renovation of two gents' and ladies' toilets in Block-1 of the JNARDDC office
- Renovation of the D-1 and D-2 Guest Houses

JNARDDC achieved 1st place in the Swachhata Pakhwada Awards 2023 for its outstanding performance, as recognized by the Ministry of Jal Shakti.

जेएनएआरडीडीसी पुस्तकालय में नई हिंदी पुस्तकें

हिंदी को बढ़ावा देने के उद्देश्य से जेएनएआरडीडीसी पुस्तकालय में 16 नई पुस्तकों का एक सेट अध्ययन एवं विमोचन हेतु उपलब्ध है। कर्मचारी इस अवसर का उपयोग कर सकते हैं जिससे हिंदी के प्रयोग के प्रचार-प्रसार में मदद मिलेगी। इसमें प्रसिद्ध लेखकों की पुस्तकें और भारतीय संविधान के बारे में पुस्तकें शामिल है।

नई हिंदी पुस्तकें

Achievements & Awards

Dr Anupam Agnihotri, Director, JNARDDC was honoured with the prestigious Dr Raja Ramanna Award from Indian Society of Analytical Scientists (ISAS) during Indian Analytical Science Congress 2024 (IASC-2024) held in VNIT, Nagpur during 22-24 February, 2024. We congratulate Dr Agnihotri for his achievement.

Dr Upendra Singh, Senior Principal Scientist, JNARDDC was honoured with Analytical Scientist Award from Indian Society of Analytical Scientists (ISAS) during Indian Analytical Science Congress 2024 (IASC-2024) held in VNIT, Nagpur during 22-24 February, 2024. We extend our wishes to him for his achievement.

Dr Papa Rao Mondi, Scientist, JNARDDC secured best paper award for the presentation of the paper titled Chemical and Mineralogical Assessment of Ceramic Material Developed from Unused Industrial Rejects: Case study of Mangenese Mine Overburden Dump of Dongri Buzurg, Maharashtra, India during Indian Analytical Science Congress 2024 (IASC-2024) held in VNIT, Nagpur during 22-24 February, 2024.

Ms Prachi Pradhan, Junior Scientist presented a paper entitled Membrane materials for energy production and storage during Recent Trends in Energy & Fuel Production Technologies (RTEFPT-2024) held during 24-25 February, 2024 at Department of Chemical Engineering, Veer Surendra Sai University of Technology, Burla, Sambalpur, Odisha and bagged the best paper presentation award.

Ms Prachi Pradhan, Junior Scientist secured 2nd position in Environment & sustainability session for the presentation of the paper titled Investigation of the Composition & Sintering Temperature of Industrial Waste Materials Synthesized Ceramic Membranes at CHEMIX '24 held at Department of Chemical Engineering, VNIT Nagpur on 6-7 April, 2024.

Mr Immanuel Kola, Junior Scientist was honoured with the award for the best presentation at the 3rd International Conference on Management and Recycling of Metallurgical waste MetWaste-2024 at IIT-BHU Varanasi. The presentation titled Towards Sustainable Copper Recycling: Techno-Economic Survey and Recommendations for a Circular Economy in India highlighted our pioneering efforts in promoting sustainable practises within the metallurgical industry.

Superannuation

Smt Rekha Tembhurne, former Personnel Officer, retired on February 29, 2024, after nearly 30 years of dedicated service. Joining the office in June 1994, she initially worked in the Bauxite & Alumina Division before transitioning to administrative roles. She received a heartfelt and fitting farewell from the employees and staff of JNARDDC.

Superannuation of Mrs Rekha Tembhurne

Mr Ashok J Hatwar, Driver cum Lat Attn. Sr Grade, who joined JNARDDC in October 1992, retired on June 30, 2024. His 32 years of service were distinguished by unwavering dedication and a flawless record, with no vehicle mishaps. The employees and staff of JNARDDC gave him a warm and fitting farewell to honor his exemplary service.

Superannuation of Mr Ashok Hatwar

New Equipment

Thermogravimetric Analyzer

Make: Leco

Model: 801

Temperature range: Ambient to 1000°C

Applications:

Thermogravimetric Analyzer determines moisture, ash, volatile content and Loss-on-ignition (LOI), in various organic, inorganic and synthetic materials. Weight change is measured as a function of temperature as samples are exposed to a temperature program in an atmosphere-controlled environment. The multi-sample furnace design allows for simultaneous analysis of upto 19 samples.

Bomb Calorimeter

Make: Parr, USA

Model: 6400

GCV Range: Up to 8000 Cal/gram

Time of analysis: 7 – 8 minutes

Temperature resolution: 0.0001 °C

Applications:

Automatic isoperibol bomb calorimeter determines gross calorific value of coal. This instrument incorporates a closed loop cooling subsystem into the Calorimeter, it also features the fixed bomb and bucket design allowing for automated bucket and jacket fill as well as automated vessel fill and rinse. It requires one minute of operator time per test, allowing a technician to operate upto four Calorimeters simultaneously.

Retrofitting of 100 kN UTM

Make: Instron, USA

Model: 5582

Capacity: 100 KN UTM

The UTM has undergone a significant upgrade, introducing several advanced features to enhance accuracy and user experience. The latest controller now includes a load weighing system that achieves an accuracy of within +/- 0.5% of the reading, down to 1/1000th of the load cell capacity, ensuring precise measurements. Additionally, the Merlin software has been upgraded to the latest version of Bluehill. The crosshead movement is now managed by an advanced Control Panel equipped with Specimen Protect technology, safeguarding samples during testing. The upgrade also includes a high rate of data acquisition, enabling more accurate and reliable test results. Furthermore, synchronizing the Universal Testing Machine (UTM) hardware with Bluehill Software has been made significantly easier.

1 Litre Autoclave

Make: Amar Equipment Pvt. Ltd., Mumbai

Maximum pressure: 100 bar

Maximum operating temperature: 375 °C

Capacity of vessel: 1 litre

The material of construction (MOC) for this vessel is Monel 400, which has excellent resistance to corrosive environments. The design pressure and temperature of the vessel are 100 bar and 425°C, respectively. This equipment is used for liquor preparation, desilication, digestion, and precipitation studies, which are vital processes in the alumina refinery.

Inhouse R&D on Critical Mineral

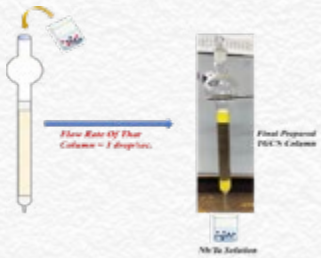
Critical minerals are crucial for modern technology, including solar panels, semiconductors, wind turbines, and advanced batteries. Their supply chain resilience is vital for the global energy transition and national security. India recognizes the importance of these minerals and has identified 30 critical ones necessary for its economic prosperity and self-reliance. The supply chains for these minerals face significant risks due to factors like market instability, social unrest, political issues, natural disasters, and geopolitical tensions. In this context, JNARDDC is also working on the extraction of (Nickel, Niobium and Tantalum) critical mineral from industrial waste.

Niobium and Tantalum:

The present inhouse R & D aims to develop an innovative and efficient process for the recovery of niobium (Nb) and tantalum (Ta) from tin slag, a by-product of tin smelting operations. Niobium and tantalum are critical metals utilized in various industries, including steel alloys, aerospace, electronics, and medical equipment. Despite their significance, the majority of Nb and Ta production is reliant on primary resources, emphasizing the importance of developing sustainable extraction methods from secondary sources such as tin slag. Our innovative approach integrates chemical reactions and selective separation techniques. After pulverizing the tin slag, alkali fusion with sodium hydroxide converts refractory Nb2O5 and Ta2O5 into water-soluble compounds, enabling selective extraction. Subsequent selective adsorption and elution steps recover Nb and Ta in solution form. This methodology offers an efficient and sustainable means of resource utilization, aligning with the imperative for fluoride-free processes.

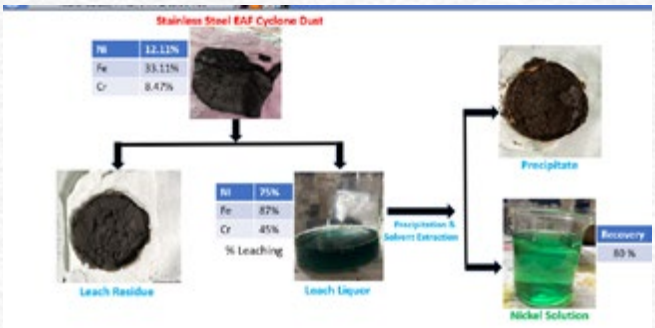
Nickel:

Nickel is entirely imported into the country, as it is not produced from primary sources. To address this, the in-house R&D focuses on recovering nickel from secondary sources, specifically electric arc furnace (EAF) cyclone dust from the stainless-steel industry. The project employs a hydrometallurgical process that includes characterizing EAF dust using XRD, XRF, and ICP-OES, followed by nickel extraction through leaching with various acids. The process also involves removing impurities such as iron, aluminum, and chromium via precipitation, and further purifying the nickel solution through solvent extraction. This approach offers an efficient and sustainable method for recovering critical minerals.



Innovative multi-step process unlocks 95% niobium and 94% tantalum extraction from challenging low-grade ore, paving the way for sustainable industrial applications.

Synthesis of Column Material: Tailored design and fabrication for efficient adsorption and selective elution of target ions.



Nickel Extraction from Stainless steel Industry EAF dust

Spotlight

YOUR NEWS

MECL's Sadbhavana Cup to boost camaraderie

Mineral Exploration & Consultancy Ltd (MECL) stated a **'Sadbhavana Cup'** inter-company cricket tournament on Saturday. The tournament will run **until May 13** at MECL, Corporate Office ground. The tournament aims at **fostering camaraderie** and sportsmanship amongst the employees of eight organizations viz **WCL**, CMPDIL, MOIL, **AMD**, GSI, **IBM**, JNARDDC & **MECL**. Chief guest **Indra Dev Narayan**, CMD of MECL inaugurated the tournament on Saturday in the presence of **Ajit Kumar Saxena**, CMD of MOIL, **Peeyush Narayan Sharma**, chief controller of mines, IBM, **YG Kale**, controller of mines (central zone), **Pankaj Kulshreshtha**, CCM, PK Gupta, regional director, AMD, **Pankaj Pandey**, director (technical), MECL and the representatives of participating companies. Following the inauguration, the tournament kicked off with an exciting match between MECL and IBM. **MECL** has organised the event in coordination with banks namely **PNB Bank**, Federal Bank, **IDFC First Bank** & Kotak Mahindra Bank.

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President of City Unit Minority Morcha of BJP. He is Founder of Heralds of Christ Foundation, Mohan Nagar, and is associated with Catholic Archdiocese of Nagpur and with national bodies. Hirekhan is also working for ground-level organisations and is involved in social work. He has thanked BJP leadership for reposing faith in him.

Dr Anupam Agnihotri

DR ANUPAM Agnihotri,

Director, Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur has been awarded with Dr Raja Ramanna Award during the International Analytical Science Congress 2024 conducted by ISAS and JNARDDC recently. Dr Agnihotri received the award at the hands of Dr Raghav Saran, President, ISAS.

Dr Upendra Kumar Singh

DR UPENDRA Kumar Singh,

Senior Principal Scientist, Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur has been honoured with 'Analytical Scientist of the Year 2023 Award' during the International Analytical Science Congress 2024 conducted by ISAS and Jawaharlal Nehru Aluminium Research Development and Design Centre recently. Dr Singh received the award at the hands of Dr B Sarvanan, Director, AMD.

मातृ सेवा संघ ने मनाया स्थापना दिवस

■ नागपुर, कार्यालय प्रतिनिधि. मातृ सेवा संघ के 103 वर्ष अक्षय तृतीया पर पूरे होने पर रंजन सभागृह में स्थापना दिवस मनाया गया. इस दौरान डॉ. रश्मि भाले उपाध्यक्ष, डॉ. लता देशमुख सचिव, डॉ. पुरुषोत्तम देशपांडे कोषाध्यक्ष, डॉ. पुष्प भाले सदस्य उपस्थित रहीं. मुख्य अतिथि जवाहरलाल नेहरू एल्युमीनियम रिसर्च डेवलपमेंट एंड डिजाइन सेंटर के निदेशक डॉ. अनुपम अग्निहोत्री थे. उन्होंने कहा कि देश को फ्यूचर स्टार भारत बनाने के लिए सभी के सामूहिक प्रयास करने की जरूरत है. इसके लिए हमें एक ऐसे आत्मनिर्भर माहौल की जरूरत है. अतिथियों का परिचय उपाध्यक्ष डॉ.रश्मि भाले ने दिया.कार्यक्रम का संचालन पलाश्री वाघ ने किया.

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JNARDDC organises workshop for aluminium and cement sectors

■ Staff Reporter

JAWAHARLAL Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur, in collaboration with the Bureau of Energy Efficiency, New Delhi (BEE), conducted a workshop at JNARDDC recently.

The workshop focused on fostering a circular economy and enhancing resource efficiency within the aluminium and cement sectors, leveraging the utilisation of spent pot-lining (SPL) and other waste products generated from aluminium production.

Distinguished stakeholders from the aluminium and cement industries, including representatives from the Global Cement and Concrete Association (GCCA), National Council for Cement and Building Materials (NCCBM), and various Pollution Control Boards, gathered to witness a live demonstration of the "SPL Detoxification and Material Recovery Unit" at the JNARDDC laboratory.

Scientists from JNARDDC explaining about the SPL to participants of the workshop.

The showcased process successfully addressed the challenge of leachable cyanide in first cut SPL through innovative heat treatment techniques. Additionally, the workshop highlighted methodologies for extracting leachable fluoride and sodium, recycling leachate to enhance sodium/caustic concentration, etc.

Sunil Khandare Director of BEE expressed enthusiasm for scaling up the process and establishing a pilot plant near a major smelter in Odisha with technical support from JNARDDC. Dr Anupam Agnihotri, Director, JNARDDC further discussed the potential for treating second cut SPL, emphasising their commitment to sustainable solutions.

Participants, including industry leaders from BEE, IDAM Infra, Hindalco, Vedanta Limited, Ultratech Cement, My Homes Cement, GCCA, NCCBM, Dalmia Cement Bharat, and Prism Johnson, engaged in a constructive roundtable discussion.

जेएनएआरडीडीसी का स्थापना दिवस 16 को

हिती मातर | नागपुर. जवाहरलाल नेहरू एल्यूमीनियम अनुसंधान विकास और डिजाइन केंद्र (जेएनएआरडीडीसी) 16 अप्रैल को अपना 35वां स्थापना दिवस मनाएगा। कार्यक्रम का उद्घाटन मुख्य अतिथि एमईसीएल के सीएमडी इंद्रदेव नारायण और एमईसीएल कंपनी के महाप्रबंधक पंकज कुमार करेंगे। जेएनएआरडीडीसी के निदेशक डॉ. अनुपम अग्निहोत्री पिछले 34 वर्षों में केंद्र की उपलब्धियों और खान मंत्रालय के एम एंड टी-पीआइआइएसएम कार्यक्रम के तहत स्टार्टअप और एमएसएमई को बढ़ावा देने में जेएनएआरडीडीसी की बदलती भूमिका पर प्रकाश डालेंगे। 'खनन, खनिज और पुनर्चक्रण स्टार्टअप बूट कैंप' स्टार्टअप और उद्यमिता के चुनिंदा सिद्धांतों को समझना' पर एक विशेष सत्र आयोजित किया जाएगा। पूरे भारत से विशेषज्ञ और उद्योगी अपनी सफलता की कहानियां साझा करेंगे। सत्र के दौरान एल्यूमिनियम एसोसिएशन ऑफ इंडिया के पदाधिकारी भी उपस्थित रहेंगे। कार्यक्रम में विभिन्न उद्योग, स्टार्टअप, सरकारी एजेंसियां और शिक्षाविद भाग लेंगे। साथ ही वर्ष 2023-24 के लिए विभिन्न तकनीकी पुरस्कार प्रदान किए जाएंगे।

VNIT, J on crit

■ Staff Reporter

JAWAHARLAL Aluminium Development and Desi (JNARDDC), Nagp Visvesvaraya National of Technology (VNIT) Memorandum Understanding (MoU) collaboration in criti such as critical research, circular ecor tiatives, climate crisi tion, and recycling tech recently.

The MoU signing m dawn of a dynamic between the two ins renowned in their con to excellence and in This partnership seek ness the collective kn resources of both V JNARDDC to address s most pressing challeng humanity today's time

The collaboration on Critical Minerals for pooling expertise t

Startups fr cities get ₹2

Hemanta Pradhan
@timesgroup.com

Bhubaneswar: In a boost to the enterpreneurship ecosystem of the state, two startups from the twin cities of Bhubaneswar and Cuttack were among five from across the country to receive grants from the Union ministry of mines.

LNIndtech Services from Bhubaneswar and Cellark Powertech from Cuttack got financial grants under the Science and Technology-Promoting Innovations in Minerals (S&T-PRISM) initiative of the ministry to fund research and innovation in startups and micro, small and medium enterprises (MSMEs) working in the field of mining and minerals sector.

Union mines minister Pralhad Joshi handed over letters of financial grants amounting to Rs 6 crore to the five start-ups at a function held in New Delhi on Thursday. The other three firms are from Pune (Maharashtra), Meerut (Uttar Pradesh) and Shillong (Meghalaya). A total of 56 start-ups/MSMEs had participated in the funding round.

The grant is aimed at fun research and innovation startups and MSMEs wor the field of mining, amon sectors

The Bhubaneswar firm has received a g Rs 40 lakh for efficie sustainable producti alumina hydrates by lysis of sodium cart and produce hydrogen

Subash Chandra Bick, director of the fi id they are creating a genous technology to co highly valuable pr from industrial was low-grade minerals.

"We have develo prototype of the techn This grant will help u ke the innovation to th

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NARDDC sign MoU for joint R&D tical minerals, climate crisis

Dr Pramod Padole and Dr Anupam Agnihotri and other scientists during the signing of the MoU.

Nehru Research gnCentre ur and institute signed a of to foster cal areas minerals omy ini- s mitiga- nologies

harks the alliance titutions mitment novation. s to har- ffect and NIT and ome of the ges facing will focus Research o explore

sustainable methods for the extraction, processing, and utilisation of critical minerals essential for various industrial applications, Circular Economy initiatives for co-developing strategies and technologies.

A brainstorming session, scheduled to be held in the near future, will provide a platform for stakeholders from both institutions to chart the course forward and identify specific areas of collaboration.

The signing of the MoU took place in presence of Dr Pramod N Padole, Director, VNIT, and Dr Anupam Agnihotri, Director, JNARDDC.

laboration represents a significant milestone in our ongoing efforts to harness the power of academia-industry collaboration for the greater good. Together with JNARDDC, we are poised to make meaningful contributions to critical areas such as sustainability, resource management, and environmental conservation".

The signing ceremony was held at VNIT, in the august presence of M T Nimje, Senior Principal Scientist and HoD Electrolysis division, JNARDDC; R N Chouhan, Senior Principal Scientist, HoD, Downstream Division; Dr Upendra Singh, HoD, Senior Principal Scientist, Analytical Division; Dr P G Rhatle, HoD, Principal Scientist, Bauxite Division; A Mankar, HoD, Alumina Division; V Ammu, Senior Scientist, Downstream Division; Anil Kumar, Junior Scientist, Downstream Division; I Raju, Junior Scientist; and Dr Anas N

om twin cr grant

level," he added.

The Cuttack based company was granted Rs 1.7 crore for setting up pilot-scale production (20kg/day) of high purity battery grade silicon material for lithium-ion battery anode.

Ashwani Pandey, co-founder of the firm, said they were producing very little silicon in the laboratory.

"We needed a helping hand to make a substantial amount of silicon for making lithium ion batteries. This grant will help us to produce battery-grade silicon material so that we can go to the next level. Our technology will reduce the weight of the battery and increase the distance run by vehicles on a single charge," he added.

Besides financial grants, the selected start ups/micro, small and medium enterprises will be provided mentorship or incubation support and technical advisory support during the entire project period by a facilitation and mentorship team under the implementing agency, Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur, an official statement of the ministry read.

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Talk of future innovation marks 35th Foundation Day of JNARDDC

Industry experts, scientists discuss mining, minerals and aluminium recycling

Chief guest Indra Dev Narayan lighting the traditional lamp. Pankaj Kumar, Dr Anupam Agnihotri and others are also seen during the ceremony.

■ Staff Reporter

MINING, mineral and recycling of aluminium were discussed by industry experts and scientists during the 35th Foundation Day of Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur, which was held on Tuesday.

JNARDDC known for its pioneering work in the field of aluminium research and development, proudly commemorates a significant milestone in its journey on Tuesday.

Indra Dev Narayan, CMD, MECL was the chief guest of the programme. Pankaj Kumar, General Manager, QC at SECL, graced the occasion as guest of honour.

Dr Anupam Agnihotri, Director, JNARDDC presided over the programme. Chief guest Narayan, acknowledged the rich legacy of JNARDDC, expressed optimism for its upcoming Sakun. Kumar highlighted JNARDDC's pre-eminent position as the top-performing laboratory for third-party referee coal samples.

Dr Agnihotri, eloquently showcased the centre's illustrious journey of achievement spanning over the past 34 years, emphasising its evolving role in fostering innovation and entrepreneurship, particularly through initiatives like the S&T-PRISM programme of the Ministry of Mines.

The theme of the event was "Mining, Mineral and Recycling Startup Bootcamp: Unveiling the Essence of Entrepreneurship" provided a platform for in-depth exploration into the core principles of startups and entrepreneurship.

The distinguished personalities hailed from diverse corners of the nation, each bringing their unique expertise and insights to the forefront. Ashwani Kumar Pandey, Cofounder Powertech Pvt Ltd, Cuttack; Ashutosh Kumar, representing Calcibe Pvt Ltd from Shillong; Dr Sohan Boddhe, CMD of Biocare India Pvt Ltd, affiliated with IIM Nagpur; Dr Sunil Bhat, ISRO Space Technology Incubation Centre at VNIT Nagpur; and Brahmadhan Murugesan, representing the Sathyabama Incubation Centre, Chennai shared their views during the event.

Ankur Agrawal and Jitendra Chopra from the Aluminium Extrusion Manufacturers Association of India (ALEMAI), Ahmedabad, further enriching the discussion with their invaluable perspectives.

Scientists from JNARDDC – R N Chouhan, Dr Upendra Singh, Dr P G Rhatle, Dr Sudhira Rai, and Dr Mohd Najar – were felicitated during the event. In a moment of acknowledgement and appreciation, Nitin Warhadpande was honoured with the prestigious 'Employee of the Year 2023-24' award, recognising his dedication and exemplary service to the Centre.

The Centre's presentation and technical session was expertly conducted by Immanuel Raju, Junior Scientist.

E Vishakha, Senior Administrative Officer, skillfully guided the proceedings. M T Nimje, HoD (Electrolysis) proposed a vote of thanks on the occasion.

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Ministry of Mines appoints JNARDDC as implementing agency for its S&T-PRISM programme

■ Staff Reporter

MINISTRY of Mines, Government of India has appointed Jawaharlal Nehru Aluminium Research Development and Design Center (JNARDDC), Nagpur as the implementing agency for its recently launched 'Promotion of Research and Innovation in Startups and MSMEs in Mining, Mineral Processing, Metallurgy and Recycling Sector' (S&T-PRISM) programme.

Under this programme, the Ministry is funding research and innovation in start-ups and MSMEs working in the field of mining and mineral sector to bridge the gap between Research and Development (R&D) and commercialisation to promote the ecosystem for complete value chain in mining and mineral sector.

The programme was launched on November 15, 2023 for inviting proposals from start-ups and MSMEs. A total of 56 start-ups and MSMEs participated in the contest out of which five have been selected for funding a total of Rs 7 crore based on milestone. Along with financial grants, these selected companies will be provided mentorship or incubation support and technical advisory support during entire project period by a Facilitation and Mentorship Team under JNARDDC.

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रामन केंद्राद्वारे विज्ञान दिनानिमित्त विज्ञान दिंडी काढण्यात आली.

विकासाची जबाबदारी नव्या पिढीवर

म. टा. प्रतिनिधी, नागपूर

■ डॉ. अनुपम अग्निहोत्री यांचे प्रतिपादन

'आझादी का अमृत काल' संधीने परिपूर्ण आहे. आम्ही २०४७ पर्यंत विकसित राष्ट्र बनण्याचे उद्दिष्ट ठेवले आहे. नवी पिढी ही बदलाची मशालवाहक आहे. त्यामुळे त्यांना ही आव्हाने आणि जबाबदारी स्वीकारावी लागेल, असे प्रतिपादन डॉ. अनुपम अग्निहोत्री यांनी केले.

राष्ट्रीय विज्ञान दिनानिमित्त रामन विज्ञान केंद्राच्यावतीने विज्ञान दिंडीसह 'विकसित भारतासाठी देशी तंत्रज्ञान' या विषयावर प्रदर्शन तसेच सर सी. व्ही. रामन स्मृती व्याख्यान आयोजित करण्यात आले होते. यावेळी डॉ. अग्निहोत्री यांनी विद्यार्थ्यांना मार्गदर्शन केले.

देशातील अनेक लोक आता नवीन डिझाइन आणि उत्पादनांच्या साह्याने स्टार्टअप बिझीनेस मॉडेल विकसित करीत आहेत. युनिकॉर्न हे एक अब्जाहून अधिक उलाढाल असलेले स्टार्टअप आहेत आणि आमच्याकडे ११३ युनिकॉर्न आहेत. नवोन्मेष आणि स्टार्ट अपसाठी भारत ही तिसरी सर्वांत मोठी इकोसिस्टम आहे, असे डॉ. अग्निहोत्री म्हणाले.

तत्पूर्वी, केंद्रातर्फे विज्ञान दिंडी आयोजित करण्यात आली. यात शहरातील दहा शाळांमधील सुमारे ३०० विद्यार्थी हातात घोषवाक्याचे फलक आणि घोषणा देत सहभागी झाले.

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JNARDDC's 35th Foundation Day on April 16

JAWAHARLAL Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur, an autonomous body of Ministry of Mines, will be celebrating its 35th foundation day on April 16.

The event will be inaugurated by Indra Dev Narayan, CMD, MECL. Pankaj Kumar, General Manager, QC, SECL, will be the guest of honour. Dr Anupam Agnihotri, Director, JNARDDC will be highlighting the Centre's achievements in the last 34 years and the changing role of JNARDDC in promoting Startup and MSMEs under the S&T-PRIMSM programme of Ministry of Mines.

A special session will be held on 'Mining, Mineral and Recycling Startup Bootcamp: Understanding the Basic Fundamentals of Startups and Entrepreneurship.'

Experts and entrepreneurs from all over India shall be sharing their success stories on the occasion.

Office-bearers of the Aluminium Extrusion Manufacturers Association of India (ALEMAI) shall also be presenting during the session. The event will be attended by various industries, startups, government agencies and stakeholders.

Various technical awards shall be presented for the year 2023-24 during the event.

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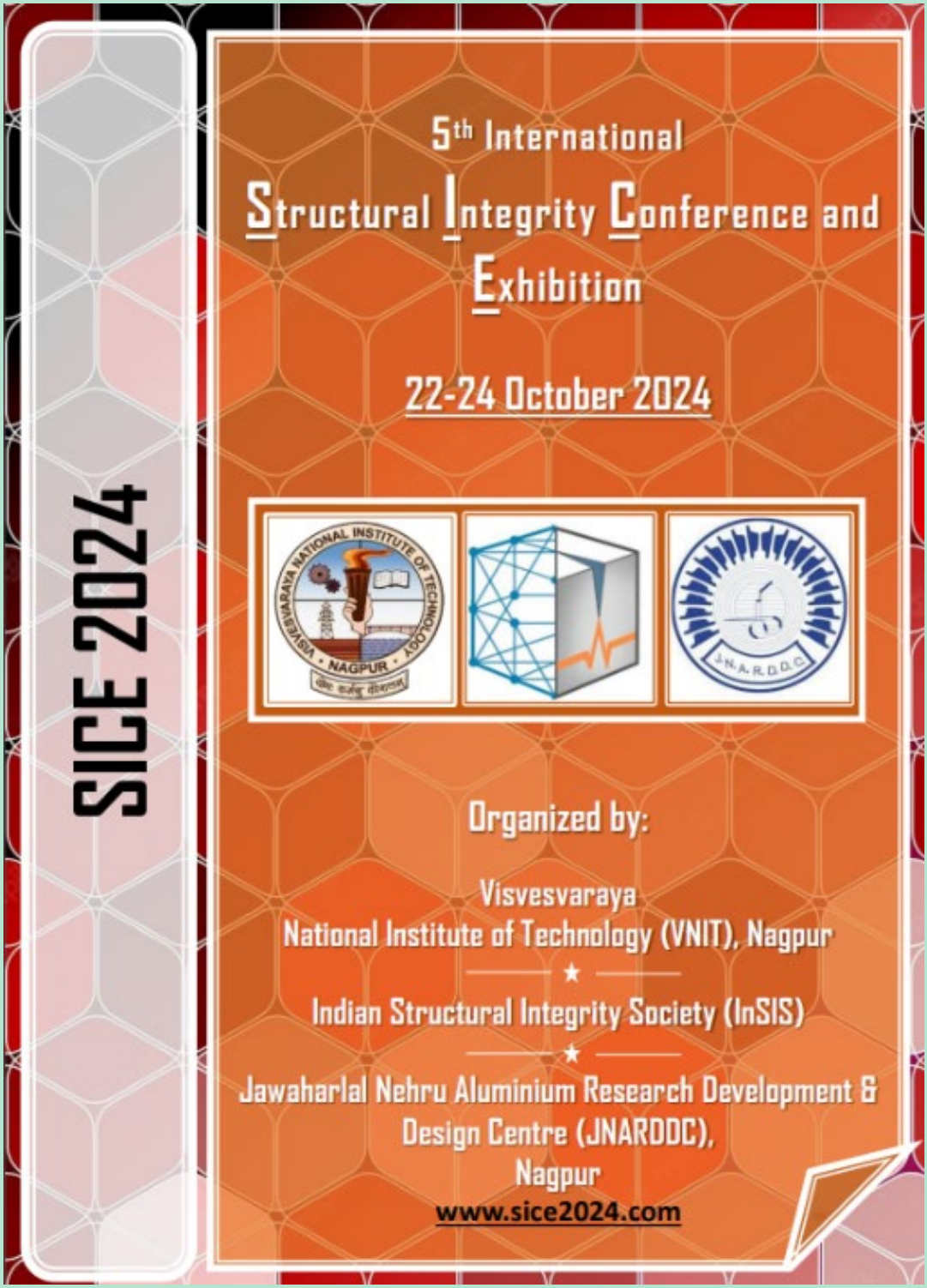
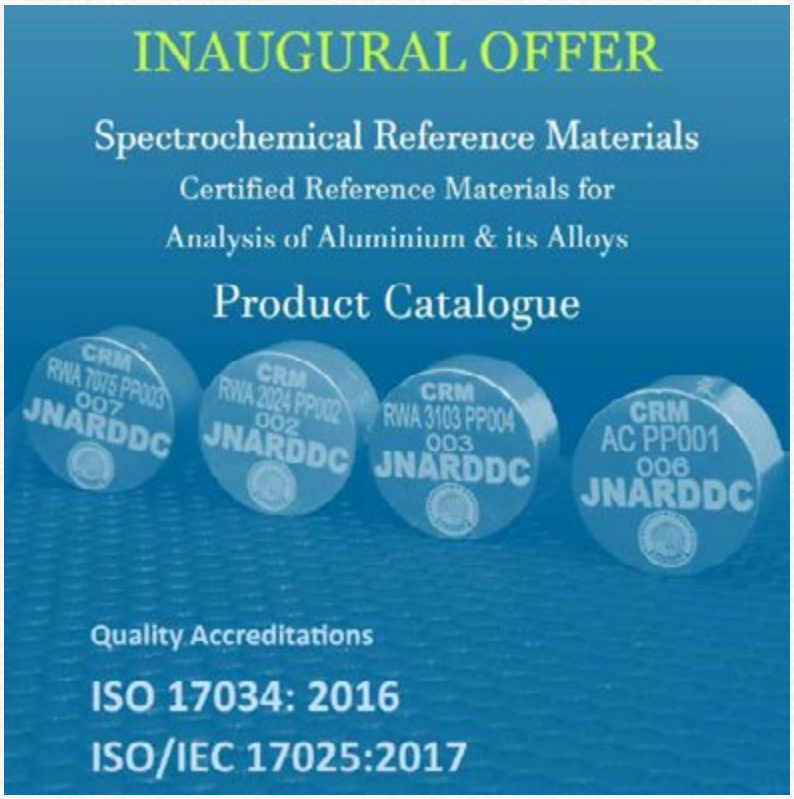
Upcoming Event





Certified Reference Materiais for Wrought Aluminium Alloys

Alloy	AA 6063	AA 2024	AA 7075	AA 3103
CRM ID	AC-PPOOI	RWA-2024-PP002	RWA-7075-PP003	RWA.3103-PP004
Si	0.4447	0.1090	0.0897	0.1191
F	0.1579	0.1313	0.1125	0.1197
cu	--	4.3682	1.4608	0.0560
Mn	(0.0081)	0.6655	0.0267	1.2409
Mg	0.4675	1.5341	2.3866	0.0201
Cr	(0.0013)	0.0136	0.2218	0.0037
Ti	0.0200	0.0333	0.0452	--
Zn	--	0.0169	5.4560	--
v	(0.0139)	(0.0084)	(0.0115)	(0.0138)
Zr	(0.0009)	--	(0.0281)	--
Pb	(0.0012)	(0.0016)	(0.0007)	(0.0031)
Bi	(0.0003)	(0.0005)	--	--
Ga	0.0103	(0.0096)	--	0.0122
Ni	(0.0040)	(0.0028)	(0.0023)	(0.0051)
B	(0.0022)	--	--	(0.0038)
Sn	--	(0.0026)	(0.0011)	(0.0027)

Remarks: Values within brackets are uncertified.

जवाहरलाल नेहरू एल्युमिनियम अनुसंधान विकास एवं अभिकल्प केन्द्र, नागपुर

Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur

Autonomous Body Under Ministry of Mines, Government of India

Amravati Road, Opposite Wadi Police Station, Wadi, Nagpur
Ph. No. : 91-7104-220701, 220017, 220476, 220763
Email : director@jnarddc.gov.in | Website : www.jnarddc.gov.in

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