Welcome Messages

Dear colleagues,

It is our great pleasure and privilege to welcome you to the virtual edition of ICMTM2021, the 2021 9th International Conference On Metallurgy Technology And Materials. The conference will be held from October 29, 2021 and is now accessible to registered participants worldwide.

On this great gathering, Organizing Committee invites participants from all over the globe to take part in this annual conference with the theme "On Metallurgy Technology And Materials". ICMTM2021 aims at sharing new ideas and new technologies amongst the professionals, industrialists and students from research areas of Metallurgy Technology And Materials to share their recent innovations and applications and indulge in interactive discussions and technical sessions at the event.

Submitted papers will be peer reviewed by conference committees, the accepted papers that presented at the conference will be included into ICMTM2021 conference proceedings, and be published with " "Solid State Phenomena" . The program will features 5 focused oral sessions, with speakers providing perspectives on related fields, both academic and commercial.

We would like to thank and welcome everyone, and hope you will enjoy ICMTM2021.

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Content

Note:

- All the participants are strongly advised to attend 10 minutes before the Webinar is start.
- Zoom ID and instructions will also be sent 4 days before the conference.
- The standard time for all programs is Thailand Time

Instructions about Oral Presentation

- Materials Provided by the Presenters: PowerPoint or PDF files
- Duration of each Presentation: Regular Oral Session: About 10 Minutes of Presentation and 2 Minutes of Q&A.

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Dr. Sathiskumar Swamiappan , Microbial Biotechnology, School of Biotechnology and Genetic Engineering, Bharathiar university, India.

Time Schedule (Beijing Time, GMT+8)

October 29th

12:55-13:00	**Opening Speech**
13:00-15:30	**Keynote Session**
13:00-13:30	**Structural Joining Of Dissimilar Materials By Fraction Stir Forming With Using Conventional Punching As Preprocessing** Prof. Takahiro Ohashi | Kokushikan University, Japan
13:30-14:00	**Longitudinal bow estimation of U-shape Profile in cold roll formed commercial aluminum alloys** Prof. Dong-Won Jung | Jeju National University, South Korea
14:00-14:30	**Poly(Ethylene Glycol) Hydrogel Films And Nanomembranes As Platform For Applications In Nano And Biotechnology** Prof. Michael Zharnikov | Heidelberg University, Germany
14: 30-15:00	**Rare Earth Magnets And Their Future Challenges Due To Escalating Demand** Dr. Nimila Dushyantha | University Of Moratuwa,SriLanka
15:00-15:30	**HOT LIME PRETREATMENT OF REFRACTORY GOLD AND SILVER ORE** Dr. Naci Umut Duru | Redwood Materials Inc., Reno, NV
15:30-15:40	**Photo & Break**
Paper ID:	**Oral Session**
3	**The effect of bentonite using edible oil as a dispersed medium on the rheological, thermal and water absorption properties of PBS/bentonite composites** Atiwat Wiriya-amornchai | King Mongkut's University of Technology North Bangkok, Rayong Campus
MT909	**Preparation and electrochemical performance of Li4Ti5O12/Co3O4 composite as an anode of Lithium-ion battery** Hongling Bao | LIAONING TEGHNICAL UNIVERSITY
MT916	**Preparation and electrochemical performance of Li4Ti5O12/SnO2 composite as an anode of lithium-ion batteries** Liang Du| LIAONING TEGHNICAL UNIVERSITY
MT917	**Mechanical Joining of Dissimilar Materials with a Hollow Rivet-Like Structure Generated by Friction Stir Forming with a Closed Die** Takahiro Ohashi| Kokushikan University, Japan
10	**Cogging operation short workpieces without forming a defect of clamp** Kosimov Nodirbek| Jeju National University, Korea
14	**Modeling process of manufacturing parts using incremental forming process** Kosimov Nodirbek | Jeju National University, Korea
13	**Structural Stability Assessment and Damage Recovery Studies for Re-manufacturing Aging Grinders** Krishna Singh Bhandari| Jeju National University, Korea
16	**Formability of Aluminum in Incremental Sheet Forming** Krishna Singh Bhandari | Jeju National University, Korea

Keynote Speakers

Prof. Takahiro Ohashi

Kokushikan University, Japan

Speech Title: "Structural Joining Of Dissimilar Materials By Fraction Stir Forming With Using Conventional Punching As Preprocessing"

Head Of Mechanical Engineering Department Of Kokushikan University (December 2012-Present); Representative Delegate Of Japan Society For Technology Of Plasticity (April 2016-Present); The Board Of Trustees Of Aluminum Forging Association In Japan; Experience In Directing A National Research Project For A New Die Structure Of Ministry Of Economy, Trading And Industry (METI); Experience In Directing 3 Research Teams Of National Institute Of Advanced Industrial Science And Technology (AIST).

Prof. Dong-Won Jung
Jeju National University, South Korea
Speech Title: "Longitudinal bow estimation of U-shape Profile in cold roll formed commercial aluminum alloys "

Professor Dong-Won Jung Jeju National University, South Korea Professor Dong-Won Jung Works In School Of Mechancial Engineering. He Has Rich Experience In Metal Forming Field. He Is A Professional Reviewer Of Plenty Journals, Such As KSME (Korean Society Of Mechanical Engineers), KSPE (Korean Society For Precision Engineering), KSTP(Korean Society For Technology Of Plasticity), KSAE(Korean Society For Automobile Engineers), Journal Of Ocean Engineering And Technology, Journal Of Korea Society For Power System Engineering, The Korean Journal Of CAE, Etc. He Also Has Lot Of Publications And Academic Conference Experiences

Prof. Michael Zharnikov
Heidelberg University, Germany
Speech Title: "Poly(Ethylene Glycol) Hydrogel Films And Nanomembranes As Platform For Applications In Nano And Biotechnology"

Michael Zharnikov Received A Master Degree (With Honour) In Solid State Physics From The Moscow Engineer-Physical Institute In 1981. From 1981 To 1991 He Worked In The RSC Kurchatov Institute In Moscow, Where He Received A PhD Degree In Experimental Physics In 1989. After Two Post-Doctoral Stints With Prof. Dietrich Menzel At The Technical University Munich (1991-1994) And Prof. Jürgen Kirschner At The Max-Planck Institute Of Microstructure Physics In Halle/Saale (1994-1996), Zharnikov Joined The Faculty Of Chemistry And Geosciences At Heidelberg University (Initially In The Group Of Prof. Michael Grunze), Where He Currently Holds A Professor Position. Zharnikov Has Published 353 Papers In Peer-Reviewed Journals, Which Have Attracted Over 11000 Citations With An H-Index Of 54. He Also Received 2 Patents And Gave 170 Lectures, Including 70 Invited/Keynote/Plenary Conference Talks. His Research Interests Include Interface Engineering, Functional Organic And Metal-Organic Films, Biointerfaces, Molecular Electronics, Organic Electronics And Photovoltaics, Molecular Sensors, Soft Matter Nanofabrication, Membranes, Electron Beam And UV Lithography, And Molecular Structure Of Liquids. The Group Actively Applies Advanced X-Ray Spectroscopy/Microscopy Techniques, Using Synchrotron Radiation Facilities All Over The World. Zharnikov Is A Member Of The Editorial Boards Of J. Electron Spectrosc. Relat. Phenom. And J. Vac. Sci. Technol. And Of The Advisory Board Of Membranes.

Dr. Nimila Dushyantha
University Of Moratuwa,SriLanka
Speech Title: Rare Earth Magnets And Their Future Challenges Due To Escalating Demand"

Eng. Nimila Dushyantha Obtained His Bachelor's Degree In Mining And Mineral Processing At The Department Of Earth Resources Engineering, University Of Moratuwa, Sri Lanka. He Also Completed His Master In Philosophy In Earth Resources Engineering. Currently, He Is Researching On Rare Earth Element Extraction From Sri Lankan Sources With The Research Team Including Prof. NP Ratnayake, Prof. HMR Premasiri, Dr. DMDOK Disanayake, Dr. LPS Rohitha, Dr. IMSK Ilankoon, Dr. AMKB Abeysinghe And Prof. PGR Dharmaratne. He Has Published His Research Findings In Peer-Reviewed Journals Such As Hydrometallurgy And Ore Geology Reviews And Some Of His Publications Are Found To Be The Most Cited Papers In Those Journals. He Is Also An Active Reviewer Of Some Peer-Reviewed Journals.

Dr. Naci Umut Duru
Redwood Materials Inc., Reno, NV
Speech Title: HOT LIME PRETREATMENT OF REFRACTORY GOLD AND SILVER ORE

Dr. Duru has more than fifteen years of experience in operations, consulting, technology center and academic research. He has worked on geometallurgy studies, operational data analysis, laboratory testing, process development, simulation, feasibility studies, financial evaluation, engineering design, procurement, construction management, commissioning of mineral processing and metallurgy plant projects. He has in-depth knowledge of Au, Ag, Cu, Mo, Fe, Cr ores beneficiation and extractive metallurgy processes. His area of expertise includes process equipment selection, flowsheet, P&ID, GA development, and operational aspects of atmospheric leaching, pressure oxidation, crushing, grinding, powder material handling, slurry transportation, gravity-size separation, crystallization, precipitation, filtration, clarifier, thickener units. He performed project tasks in USA, Europe, Northern Africa and Southwest Asia and managed/coordinated technical contributors.

Paper ID:3

Title: The effect of bentonite using edible oil as a dispersed medium on the rheological, thermal and water absorption properties of PBS / bentonite composites

Abstract: Polybutylene succinate (PBS) with bentonite was investigated for its rheological, thermal and water absorption properties. The bentonite (BTN) was modified with soybean oil (SBO) and lard oil (LO) (2:98 clay: oil % by weight) by mechanical stirring and ultrasonication. The composites were prepared using an internal mixer and processed by compression molding. Under the bentonite modification conditions, XRD showed that the bentonite layers were penetrated with edible oils into the small layers and the enhancement of d-spacing between the BTN-layers in the composites. A small platelet-like structure of the modified bentonite composites was observed by SEM micrographs. The increase in MFI of untreated bentonite displayed the viscosity of PBS involving the moisture and water molecules decreased the frictional force. In addition, the viscosity of composites between PBS and treated bentonite with LO represented in an increase of the MFI value. Regarding the thermal properties, the presence of bentonite could act as a nucleating agent for PBS at low content (1-2%). Moreover, the treated with edible oils of bentonite could increase the percentage crystallinity of PBS at higher bentonite content. The presence of bentonite tends to increase the water absorption behavior of PBS/bentonite composites. The results indicate that PBS/modified bentonite using edible oil could be a potential alternative, low cost and environmentally friendly material with superior impact properties useful for further applications.

Paper ID: MT909

Title: Preparation and electrochemical performance of Li4Ti5O12/Co3O4 composite as an anode of Lithium-ion battery

Abstract: The Li4Ti5O12/Co3O4 composites were prepared by hydrothermal reaction method with different Co3O4 mass content (3%, 7%, 11%, and 15%). The Li4Ti5O12 nano particles were set in-situ on the Co3O4 sheet. Co ion was doped into the Li4Ti5O12 lattice. The first cycle specific capacity firstly increased and then decreased with Co3O4 content increasing, which the discharge capacity reached the peaking value that the first capacity was 1111 mAh/g and the specific discharge capacity retained 240 mAh/g after 200 cycles. After 200 cycles of charge and discharge, the retention of the capacity was 96.4% at 0.1 A/g, and the retention of the capacity was 98.4% at 0.5 A/g.

Paper ID: MT916

Title: Preparation and electrochemical performance of Li4Ti5O12/SnO2 composite as an anode of lithium-ion batteries

Abstract: Li4Ti5O12/SnO2 composite with different SnO2 contents were prepared by hydrothermal method. SnO2 nanosheets were in situ formed on the surface of Li4Ti5O12 nanoparticles. At the same time, Sn ions were doped into the Li4Ti5O12 lattice, which effectively improved the conductivity of Li4Ti5O12. When the content of SnO2 was 8 %, the electrochemical performance of Li4Ti5O12/SnO2 composite was the best. The first discharge specific capacity was 480.54 mAh/g. The capacity remained at 276.8 mAh/g after 200 cycles at 0.1 A/g, and the capacity retention was as high as 87.4% (compared with the 10th cycle).

Paper ID: MT917

Title: Mechanical Joining of Dissimilar Materials with a Hollow Rivet-Like Structure Generated by Friction Stir Forming with a Closed Die

Abstract: A technique fabricating structural joints by closed-die type friction-stir forming is introduced in this paper. The process is as follows. First, a steel sheet having a prepared hole was put on an aluminum alloy plate. Then, the die having a through-hole cavity was placed above them to press down the steel sheet tightly. Next, a rotating stepped cylindrical tool was inserted into the through-hole cavity. At that time, the upper side of the tool was nearly contacted at the inner surface of the through-hole to enclose the die cavity. Finally, the top of the toll penetrated into the aluminum alloy plate through the prepared holes of the steel sheet to extrude the material backward. Consequently, the material fills the whole of the space between the tool and die to generate a hollow-rivet-like aluminum alloy structure fastening the steel sheet. This technique makes alignment between the die and the prepared hole of steel easier than conventional joining technique using friction stir forming (FSF), and enables the one side approach from the side of the harder material with higher melting temperature to join dissimilar materials; that had been difficult for conventional friction-stir welding and forming.

Paper ID: 10

Title: Cogging operation short workpieces without forming a defect of clamp

Abstract: Special methods and physical modeling are used to reduce sinks which are appeared at the ends of the workpiece during cogging the workpieces according to the circle-circle scheme according to standard factory modes. The sinks are later transformed into a clamp during forging. The cogging process with maximum possible reduction and feeds is carried out to avoid this kind of defect. A cogging method that makes it possible to obtain forgings from short workpieces without end-clamps is proposed.

Paper ID: 13

Title: Structural Stability Assessment and Damage Recovery Studies for Re-manufacturing Aging Grinders

Abstract: Remanufacture the used product saves money along with maintaining waste material. These days politicians are concern about remanufacturing technologies. So, companies are interested in producing product from reusable materials. Remanufactured products are increasing because it has a benefit for environment as an eco-friendly and energy-economical product. One of big reason for that is, because those materials are eco-friendly. Remanufacturing is defined as a series of processes to re-commercialize end-of-life products and parts as new products. Various remanufacturing markets already exist throughout the world. However, the size and types of remanufacturing markets differ according to as per demand and country policy. In this paper, the grinding machine damage part was studied for restoration technology. likewise grinding the spindle and chrome deposition. The cause of the damage was evaluated by the damage recovery method. Additionally repaired the surface by deposition of hard chromium plating. The scratching of the stones and tables was examined in the paper.

Paper ID: 14

Title: Modeling process of manufacturing parts usingincremental forming process

Abstract: In this paper the issues of modeling the process of forming sheet materials using method of incremental forming for the manufacture of thin-walled non-axisymmetric parts. The proposed method of forming implemented by deformation of sheet material by providing the required trajectory of movement of the working tool in order to obtain the surface of a product of a given shape. Simulation and analysis of all experiment results are carried out.

Paper ID: 16

Title: Formability of Aluminum in Incremental Sheet Forming

Abstract: Single point incremental forming (SPIF) process is used to deform complex shapes. Through SPIF process metallic sheet is formed. The formability of a AA5052 is evaluated using SPIF method for industry level product. The utility of SPIF is broad in industries because of the simple operating system of manufacturing and designing metal substances throughout computer design combined with the CNC machine. While forming Mantellic sheet there are many benefits. This process is extensively adopted in automobile, aeronautical, and medical industries for engineering complex parts. In this paper, the main objective is to examine the formability of AA5052 aluminum alloy raw material with various wall angles and operating boundaries using the modified computer numerical control (CNC) milling machine. Here, the shape correctness and the surface roughness are focused for computing the forming depth, wall angle, and spring-back for obtaining improved parts with a proper material with finish surface. For verifying the real-time experiments and evaluating the existence of stress, strain, and thickness variations.

Paper ID: MT914 (POSTER)

Title: Preparation of non-enzymatic glucose sensing nanocomposite based on NiCo2O4 nanosheets@ reduced Graphene Oxide and design of glucose detection system

Abstract: A non-enzymatic glucose sensing nanomaterial which consists of the NiCo2O4 nanosheets grown on reduced graphene oxide (NiCo2O4@rGO) is synthesized by a simple co-precipitation procedure. Firstly, the morphology and composition of the NiCo2O4@rGO are analyzed. Subsequently, the glucose sensing characteristics of the NiCo2O4@rGO are researched by Cyclic Voltammetry and Amperometry. The test results show that the prepared NiCo2O4@rGO has excellent glucose sensing properties. In the two linear detection range of 0.01mM-5.50mM and 5.50mM-15.50mM, the sensitivity reaches 4372.9μA·mM-1cm-2 and 1686.1μA·mM-1cm-2, respectively. In addition, in order to reduce the cost of electrochemical testing and improve the convenience and practicability of detection, a portable potentiostatic glucose detection system based on three electrodes is designed. Through testing, it is found that the non-enzymatic glucose detection system based on NiCo2O4@rGO has good practical application potential in the field of glucose detection.