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Scientific Meetings

World Congress on

Recycling & Waste Management

AUGUST 19-20, 2024

Venue:
Novotel Paris Centre Bercy, 85 Rue de Bercy, 75012
Paris, France

Scientific Program

08:30–08:45: Registrations

08:45–09:00: Opening Ceremony

DAY 1

AUGUST, 19 2024

Keynote Presentation

09:00-09:40	
Xukai Fu Beijing Jinkai New Energy Environmental Technology Co., Ltd, China	Title: Future Thinking in the Circular Economy: Navigating Challenges with Innovative Technologies

09:40-10:20	
Kaluszynski Michel K.O.B. for Kind of Blue SAS – Toulouse, France	Title: Glass Waste Recycling For Advanced Water Filtration Solution

Session Introduction

Tracks

E–Waste Recycling and Management | Solid Waste Management | Petrochemical and Oil Recycling | Circulatory Economy | Renewable Energy | Waste Water Recycling | Sustainable energy and economy | Plastic Recycling | Recycling Market

Session Chair: Xukai Fu, Beijing Jinkai New Energy Environmental Technology Co., Ltd, China

Group Photo | Coffee Break 10:20–10:40 @ Foyer

10:40-11:05	
Deependra Banstola Hemja RMC Pvt Ltd, Nepal	Title: Solid waste management practices in Nepal

11:05-11:30	
Dina Magdy Abdo Central Metallurgical Research and Development Institute, Egypt	Title:Recovery of Valuable Materials from End–of–Life Photovoltaic Solar Panels

11:30-11:55	
Ayat N. El-Shazly Central Metallurgical Research and Development Institute, Cairo, Egypt	Title: Emerging bismuth-based materials: From fundamentals to energy applications

Poster Presentations

11:55-12:20	
Chae-gun Phae Seoul National University of Technology, Korea	Title:Current status and prospects of household waste management system using ICT(RFID, IOT, AI) technology.

Lunch Break 12:20-13:20

13:20-13:40	
Teresa Lopez-Arenas Universidad Autonoma Metropolitana, Mexico	Title: Conceptual design of a biorefinery for the valorization of spent coffee ground

13:40-14:00	
Kholood Yousef Kuwait Oil Company (KOC), Kuwait	Title: Oil Based Mud (OBM) Waste Best Practices Management in Kuwait Oil Company (KOC)

Special Workshop

14:00-14:40	
Xukai Fu Beijing Jinkai New Energy Environmental Technology Co., Ltd, China	Title: Artificial Intelligence in Action: Advancing Urban Environmental Management through Circular Economy Innovations

Panel Discussion & Certificate Falicitation

Day -1 Ends

DAY 2

AUGUST, 20 2024

Zoom Meeting (GMT+2) Time in France

09:00-09:20	
Santosh Kumar Mishra S.N.D.T. Women's University (Retired), Mumbai, India	Title: Management of Waste Water in Caribbean Region: Initiatives of Global Water Partnership–Caribbean (GWP–C)
09:20-09:40	
Bagtache Radia University of Science and Technology Houari Boumediene, Algeria	Title: The elimination of methyl violet by a cobalt phosphate under visible irradiation
09:40-10:00	
Michael McCoy Metro Waste Authority, USA	Title: Increase Commodity Capture and Marketability through Unique Disposal Outlets
10:00-10:20	
Fatma Erturk Dokuz Eylul University, Buca Faculty of Education, Turkey	Title: Sustainable Recycling in a Cosmopolitan World: Technological Recycling Bins
10:20-10:40	
Dai–Yeun Jeong Director of Asia Climate Change Education Center, South Korea	Title: A Framework of Recycling and Waste Management for Establishing Resource Circulation Society
10:40-11:00	
Emmanuel Ayorinde Ajiboye Argonne National Laboratory, USA	Title: Sequential Extraction of Critical Metals from Processed Spent Lithium– Ion Batteries Using Solvent Membrane Based Process
11:00-11:20	
Takalani Grace Tshitangano University of Limpopo, South Africa	Title: Challenges Of Medical Waste Management In Resource–Limited Healthcare Facilities, South Africa

Panel Discussion

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KEYNOTE PRESENTATIONS
DAY 1

Xukai (Leo) Fu
Director, Beijing Jinkai New Energy Environmental Technology Co., Ltd, China

Future Thinking in the Circular Economy: Navigating Challenges with Innovative Technologies

This research delves into the sophisticated realm of future thinking, establishing a clear distinction from simple future predictions by outlining its foundational principles. The study conducts an in-depth exploration of how context and evidence interact within the circular economy, spotlighting the distinct challenges posed by varying international contexts. It emphasizes the critical need for a holistic approach that integrates environmental sustainability with socio-economic factors, aligning the interests of the planet, people, and profit.

Moreover, this paper clarifies the crucial functions and duties of change agents in advancing sustainable development. It leverages Jinkai's innovative solutions—the Food Waste Treatment Machine, Intelligent Water Truck, and Intelligent Sweeper Truck—as practical examples. These case studies demonstrate the ways in which entities and individuals can harness and deploy evidence to foresee and influence forthcoming changes, promoting significant improvements in the circular economy.

The conclusion of the paper introduces three overarching principles for managing the evidence ecosystem and advocates for creative approaches to bolster circular economic models. By offering a strategic framework for evidence-based decision-making, the research provides valuable guidance for decision-makers, industry leaders, and stakeholders aiming to implement robust sustainability strategies. This comprehensive methodology seeks to encourage the widespread adoption of effective circular economy practices, aiming to enhance the sustainability and resilience of global economic systems.

Keywords: Future Thinking, Circular Economy, Sustainability, Environmental Innovation, Evidence-Based Decision Making

Biography:

Xukai Fu currently serves as the director of Beijing Jinkai New Energy Environmental Technology Co., Ltd. As a serial entrepreneur, he entered the circular economy industry in 2009, becoming one of the early pioneers in China's research and application of new energy sanitation vehicles, thus emerging as a leading figure within the industry.

He is dedicated to the field of sanitation informatization, driving urban sanitation management towards precision, digitization, and intelligence. By employing AI artificial intelligence and digital technology, integrating IoT big data, and assembling intelligent terminal modules with a smart sanitation informatization cloud management platform, he has realized a "closed-loop" sanitation service system of "service, management, and disposal," leveraging years of commercialization experience within the industry to promote a comprehensive upgrade of the sanitation industry.

Kaluszynski Michel

Strategy Director Investors and Institutional Relation K.O.B. for Kind of Blue SAS - Toulouse (France)

Glass Waste Recycling For Advanced Water Filtration Solution

After 3 years of R&D, KOB developed and patented the SANDBAG®, an innovative water filtration solution crafted from recycled glass, which significantly reduces water and energy overconsumption in water treatment chains.

Unique industrial process

Our industrial units transform glass containers wastes in specific angular to semi-angular particles that fosters the retention of suspended material in water flow (our material is NOT a standard sand glass). This material is selected and bagged in rPET mesh. The combination constitutes the innovative filtration solution to be implemented in sand filters. Thanks to this new way to valorise glass wastes, backwash cycles, that are **big consumers of water in the maintenance operations of sand filters**, are significantly reduced.

Examples:

Pool application: the use of the SANDBAG® saves at least 4 to 5 cubic meter/ pool/ year. In France there is 2 million of pools operating with sand filters. This represents an opportunity to save 8 to 9 million of cubic meters of water by using SANDBAG®.

- Agricultural irrigation: At least in one summer, a mid-size fruit-growing farm in southeast of France consumes 500 cubic meters of water in backwash operations. The use of the SANDBAG instead of sand as a media filter, should enable to save around 20% to 30 % of the water volume used in backwash in the critical period when availability of water is at its worst level.

Vision

Mobilizing its robust expertise, KOB operates by collaborating with regional strategic partners to spread its industrial solution through licencing contracts.

As today KOB is producing its SANDBAG in a first unit in Toulouse. Agreements are currently under negotiations to implement the units in Europe and in territories where glass wastes and water scarcity are both major concerns.

Biography:

Michel graduated in Applied Physics Master (Paris 76), Offshore Engineering (ENSTA 79), Financial Management (TSM 97). Michel has an international industrial path, as construction project manager within Total (Norway China Japan UK Saudi Arabia), then in Space Industry (Matra now branded Airbus Defense and Space) as finance director (Launchers, Man in space, Satellite integration, Galileo constellation...) or Corporate Secretary (Geoinformation Division). He is a serial investor/ entrepreneur in the last 25 years in global, circular, cooperative economy. He managed as CFO MD the first private equity crowdfunding platform (WiSEED). He is one among the four cofounders of KOB.

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SPEAKER PRESENTATIONS
DAY 1

Deependra Banstola
Hemja RMC Pvt Ltd, Nepal

Solid waste management practices in Nepal

The waste management practices in landfill sites is a deciding factor for the assessment of environmental impacts such as littering, odor, groundwater, surface water and soil contamination. This paper mainly focuses on the types of waste coming to landfill and existing waste management followed at sanitary landfill sites of Nepal. The study was carried out at sisdole, Pokhara and karaute Danda landfill sites of Nepal. The waste composition was performed and minute particles were sent to the lab to test the composition. Waste management practice was observed at field and by interviewing key informants. The organic composition of waste was found as high as 62% to 65%. at different sites. The presence of heavy metal like lead, chromium and nickel reveals that the landfill is contaminated with industrial waste as well. The waste management practices at Pokhara site is better compared to other two sites. Where shorting composting and selling of recyclable and reusable wastes are done.

Keywords: waste management practice, sanitary landfill sites, recyclable, reusable wastes.

Biography:

Deependra Banstola has completed his Master Degree in Construction Management from Pokhara University of Nepal, and is currently PHD scholar of kathmandu University of Nepal. He has also worked with international organizations like International Federation of Red Cross and Red Crescent Society, Save the Children International, Plan International in the field of Water Sanitation and Hygiene.

Dina Magdy Abdo[1],Ayat Nasr El-Shazly[1] andFranco Medici[2]
[1]Central Metallurgical Research and Development Institute, P.O. Box 87, Helwan, Cairo 11421, Egypt
[2]Department of Chemical Engineering, Materials and Environment, "Sapienza" University of Rome, Via Eudossiana 18, 00184 Roma, Italy

Recovery of Valuable Materials from End-of-Life Photovoltaic Solar Panels

The disposal of end-of-life (EOL) photovoltaic solar panels has become a relevant environmental issue as they are considered to be hazardous electronic waste. On the other hand, enormous benefits are achieved from recovering valuable metals and materials from such waste. Eventually, physical and chemical processing will become the most important stages during the recycling process. A physical treatment including crushing, grinding, and screening was achieved, and it was observed that a fine fraction of −0.25 mm had the maximum percentage of the required materials. Moreover, the optimum chemical treatment conditions were adjusted to reach the maximum recovery of silver, aluminum, and silicon. The synthesis of silicon oxide, silver oxide, alunite, and K-Alum from leachant solution was performed through a simple route. The structural and morphological properties of the prepared materials were defined by X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), and field emission scanning electron microscopy (FESEM).

Keywords: solar panels; recycling; solid waste; physical treatment; chemical treatment

Biography:

Dr.Dina Magdy, a researcher in the chemical and Electrochemical Processing Department-Minerals Technology - Central Metallurgical Research & Development Institute (CMRDI), Cairo, Egypt, who has PhD from the Chemical Engineering Department, Faculty of Engineering, Cairo University. My field of interest is waste management using chemical processing. She has published 4 papers in reputed journals.

Ayat N. El-Shazly
Central Metallurgical Research and Development Institute, Cairo, Egypt

E-BABE- Emerging bismuth-based materials: From fundamentals to energy applications

In practical applications, supercapacitors, renewable and efficient techniques of energy storage and conversion, are commonly assembled into supercapacitors, which have been attracting growing interest in energy applications for the past decade. To achieve this decisive task, electrode materials with high energy density and electrochemical stability must be explored for environment-friendly and economical utilization. Numerous studies have been conducted on metal-based compounds and their relative materials; including bismuth-based materials and their composites are promising because of their redox behavior, charge storage capacity, environmental friendliness, and increasing research toward their application in energy for solar water splitting and supercapacitor. Herein, we outline bismuth materials and their composites, as investigated by our research, highlight their applications in energy, and, more importantly, focus on the study of their performance in photoelectrochemical hydrogen production and supercapacitive electrochemical techniques. We also present a summary of energy storage devices and their mechanisms, as well as other types of non-bismuth-based electrode materials available in the market. In addition, the major challenges and future perspectives of bismuth-based composites for energy purposes are addressed.

Biography:

Ayat has completed her PhD in 2017 from Ain Shams University and she is working as assistant professor at CMRDI. She is interesting in the fabrication of materials for energy storage and conversion applications. She has published more than 23 papers in reputed journals.

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POSTER PRESENTATION
DAY 1

Chae-gun Phae
Seoul National University of Technology, Dept. of Environ. Eng., Seoul 01881, Korea

Current status and prospects of household waste management system using ICT(RFID, IOT, AI) technology

In order to form a resource-recycling society and realize carbon neutrality, it is necessary to implement a cleaning administration that maximizes recycling and minimizes greenhouse gas emissions. Korea has continued to develop and advance waste management. Recently, a new concept of household waste management system is being applied by combining ICT technologies such as RFID, IOT, and AI. In the past, waste for incineration and landfill and food waste for recycling were charged differential treatment costs depending on the size of the container, that is, the size of the plastic bag. Recently, a system that combines IoT and RFID to measure the weight of waste in a container and charge a processing fee is being distributed. It was difficult to manage recyclable resources by type and source. Recently, an on-site information management system has been applied to build a system that inputs image information and handling weight in the process of generation, collection, transportation, sorting, and treatment based on a handphone app, and an AI-based (shape recognition system) sorter is installed in the sorting facility. is being installed to improve selection efficiency. Recently, various forms of ICT technologies such as RFID, IOT, and AI have been applied to household waste management, and the introduction of these technologies is promoting resource circulation and the formation of a low-carbon society while suppressing waste generation.

Biography:

Chae-gun Phae received his doctorate from Tokyo Institute of Technology, Japan, in December 1990, and returned to Korea in 1991 to develop food waste and sewage sludge resource technology, and develop systems and policies related to recycling and resource circulation. Currently, he is the head of the plastic-free talent training program and is developing a plastic-free policy.

Teresa Lopez-Arenas
Universidad Autonoma Metropolitana – Cuajimalpa, Departamento de Procesos y Tecnologia, Mexico City 05348, Mexico

Conceptual design of a biorefinery for the valorization of spent coffee ground

From a circular economy perspective, the use of both raw materials and waste, as well as the production of high value-added products in a biorefinery, improve the economics of the production process, minimize waste discharge and energy consumption, and reduce dependence on petroleum products. So biorefineries offer new economic opportunities for agriculture and the chemical industry. In particular, the valorization of spent coffee ground is a potential opportunity, since currently the largest use of this waste is as fertilizer. However, several value-added products can be obtained through chemical and biotechnological processing. For example, coffee oil can be recovered and subsequently converted into biodiesel. Spent coffee waste can also be used to produce pellets, which can be used for the cogeneration of heat and electricity. Or even the waste can be treated biotechnologically to produce biopolymers, such as PHB (polyhydroxybutyrate). So, the objective of this presentation is the proposal of a conceptual design of a biorefinery to process the spent coffee ground into value-added bioproducts, which are evaluated through process modeling and simulation. The conceptual design considers different industrial-level processing technologies to manage reasonable quantities of spent coffee waste generated in Mexico City. The technical evaluation is currently being carried out, and later it is intended to evaluate the profitability and environmental impact of the biorefinery.

Biography:

Teresa Lopez-Arenas is a chemical engineer, with doctoral studies at the Universidad Autonoma Metropolitana – Iztapalapa (Mexico) and postdoctoral studies at the University of Cagliari (Italy) and the Technical University of Denmark. She is a founding professor and researcher at the Universidad Autonoma Metropolitana – Cuajimalpa since 2006. She has published more than 50 articles in renowned journals. Her research area is mainly bioprocess engineering for the design and technical-economic-environmental evaluation of biorefineries.

Kholood Yousef
Kuwait Oil Company (KOC), Kuwait

Oil Based Mud (OBM) Waste Best Practices Management in Kuwait Oil Company (KOC)

In line with Kuwait Oil Company (KOC) strategic objectives, KOC has established the HSSE Management System with procedures based on national and international standards in order to focus on health, safety and environmental (HSE) protection. Drilling waste and its treatment is an increasingly important part of any oil drilling operation. These wastes, which typically include drill fluid cuttings and well bore clean-up fluid are hazardous and must be treated before disposal. Drill cuttings are produced as the rock is broken by the drill bit advancing through the rock or soil; the cuttings are usually carried to the surface by drilling fluid circulating up from the drill bit. Oil Base Mud Drill Cuttings (OBM) & Synthetic Oil Based Mud Drill Cuttings (SOBM) are hazardous in nature, mainly due to PAH (Poly Aromatic Hydrocarbon) contents of diesel, the base fluid of OBM and SOBM respectively. PAH consists of toxic priority pollutants. Diesel typically contains 5 to 10% PAH which falls under the hazardous waste category. There are many methods of treating drill cuttings, but thermal desorption method has shown comparative advantage over others. This is demonstrated in its ability to conserve base liquid contents especially the base oil which has high economic value. The technology of indirect thermal desorption provides indirect and controlled heating to remove hydrocarbons undestroyed. Recovered hydrocarbons are reusable as base fluid for making fresh OBM and the recovered water is reused to hydrate treated soils. Indirect heating is safer and minimize the pollution compared to direct heating. This research shows that the method is most effective, economical and environmentally friendly. The recovery of the products and subsequent recycling and selling help reduce stress on the environment and avoidable economic loss. OBM Cutting Treatment Plants have successfully treated more than 120,000 MT/Year of OBM and also started treatment of SOBM drill cuttings respectively and approx. 40,000 bbls of recovered oil (diesel) has been used in OBM plants itself (Plants are operated on 100% recovered diesel). This project has been selected for one of the Six Sigma Green Belt project in Exploration & Drilling (E&D) Directorate. The plant benefits KOC financially as well by enhancing the corporate image by turning waste into value.

Biography:

Ms. Kholood Yousef is presently working as Snr. Environment Engineer in Corporate HSE Group. She holds Bachelor degree in Chemical Engineering from Kuwait University, Kuwait. She has vast experience in the HSSEMS Management System in the Oil and Gas Industrial Sector for over 22 years. She has experience in different environmental subjects such as waste & wastewater management, ESIA, Soil & Groundwater Management System, Inland Oil Management and Environmental Standards.

Work Shop Presentation

Xukai Fu
Director, Beijing Jinkai New Energy Environmental Technology Co., Ltd.

Artificial Intelligence in Action: Advancing Urban Environmental Management through Circular Economy Innovations

This research introduces a suite of cutting-edge technologies specifically designed to promote the principles of the circular economy. The innovations include an Intelligent Identification Sweeper Truck, an Intelligent Identification Water Truck, a Food Waste Treatment Machine, and an Intelligent Cloud Platform for Urban Road Sanitation Inspection. Utilizing artificial intelligence and digital technologies, this study assesses the impact of these tools in fostering urban sustainability through reduced emissions and enhanced environmental stewardship.

Empirical analysis is conducted based on the deployment of these technologies in multiple urban environments, evaluating their operational efficiency and environmental benefits. The Intelligent Identification Sweeper Truck and Water Truck are analyzed for their precision in operation and ability to significantly lower urban pollution levels. The Food Waste Treatment Machine's role in reducing biodegradable waste and converting it into valuable resources is scrutinized, showcasing its contribution to waste minimization and resource optimization. Similarly, the Intelligent Cloud Platform is explored for its capacity to monitor and manage urban sanitation more effectively, providing real-time data that enhances decision-making processes.

The study further explores the scalability of these technologies, discussing their global applicability and potential to address some of the most pressing sustainability challenges faced by urban areas around the world. The findings indicate that the adoption of such integrated technological solutions can substantially improve environmental management systems, leading to the development of more resilient and eco-friendly urban communities. This research highlights the transformative impact of digital innovations in advancing the objectives of the circular economy, offering significant insights for policymakers, urban planners, and sustainability practitioners.

Keywords: Circular Economy, Urban Sustainability, Intelligent Systems, Artificial Intelligence, Environmental Management, Waste Reduction Technologies

Biography:

Xukai Fu currently serves as the director of Beijing Jinkai New Energy Environmental Technology Co., Ltd. As a serial entrepreneur, he entered the circular economy industry in 2009, becoming one of the early pioneers in China's research and application of new energy sanitation vehicles, thus emerging as a leading figure within the industry.

He is dedicated to the field of sanitation informatization, driving urban sanitation management towards precision, digitization, and intelligence. By employing AI artificial intelligence and digital technology, integrating IoT big data, and assembling intelligent terminal modules with a smart sanitation informatization cloud management platform, he has realized a “closed-loop” sanitation service system of “service, management, and disposal,” leveraging years of commercialization experience within the industry to promote a comprehensive upgrade of the sanitation industry.

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SPEAKER PRESENTATIONS
DAY 2

Santosh Kumar Mishra
S. N. D. T. Women's University (Retired), India

Management of Waste Water in Caribbean Region: Initiatives of Global Water Partnership-Caribbean (GWP-C)

Managing waste water in the Caribbean countries is of paramount importance in view of the fact that discharge of untreated waste water into the environment harms ecosystems and damage the sands and seas. Several programs have been undertaken by the involved stakeholders for waste water treatment in the Caribbean region. One such initiative is the Global Water Partnership-Caribbean (GWP-C). Objective of this paper is to present discussion on strategic measures undertaken by the GWP-C for sustainable management of water resources at the community, national and regional levels. Secondary data ('qualitative') have been used, and method of data analysis is 'descriptive'. Analysis of data indicates that the GWP-C, established in 2004, strives to foster the application of Integrated Water Resources Management (IWRM) in the Caribbean region. It is pertinent to note that the IWRM project is directed towards coordinated development and management of water resources. The mission is to maximise economic and social welfare without compromising the sustainability of ecosystems and the environment. The GWP-C is 1 of 13 Regional Water Partnerships (RWPs) of the Global Water Partnership (GWP). The GWP, founded in 1996, by World Bank, United Nations Development Programme (UNDP) and Swedish International Development Cooperation Agency (SIDA) aims to foster integrated water resources management. The GWP-C, with over 100 partners in more than 20 Caribbean countries, has impacted management interventions with focus on resource protection and water supply. It is pertinent to note that waste water management in the Caribbean region is included under the umbrella of "water management". This is in line with strengthening efforts for the purpose of meeting SDG-6: "ensuring access to water and sanitation for all". The paper briefly concludes that the GWP-C, in collaboration with other developmental partners, is committed to strengthen interaction for sustainable and integrated water resource management in the Caribbean region.

Key Words: Waste Water, Management, Caribbean Region, Initiatives, GWP-C, Integrated Water Resources Management, and Global Water Partnership

Biography:

I am Independent Researcher (Scholar), having retired from Population Education Resource Centre, Department of Lifelong Learning & Extension, S.N.D.T. Women's University, Mumbai, India. I underwent training in demography & acquired Ph. D. I have authored (some co-authored) 5 booklets, 4 books, 23 book chapters, 105 journal articles, 2 monographs, 7 research studies, & 104 papers for national & international conferences. I have been awarded with Certificate of Excellence in Reviewing for six years: 2017, 2018, 2021, 2022, & 2024; and conferred with Excellence of Research Award for outstanding contribution & recognition in the field of agriculture in the year 2021.

Bagtache Radia
USTHB, Faculté de Chimie, Laboratoire: Electrochimie-Corrosion, Métallurgie et Chimie Minérale; BP 32, ElAlia, Bab-Ezzouar, 16111 Alger, Algérie

The elimination of methyl violet by a cobalt phosphate under visible irradiation

Water is the main element of all living beings and its pollution is the result of human activity causing physical, chemical, biological or bacterial deterioration of its natural properties. And therefore it destroys the aquatic life of animals and affects water resources and environmental balance. Dyes are among the most common organic pollutants. Various methods have been developed for the treatment of wastewaters; photocatalysis was the most favorable and popular one. Many semiconductors were usually applied for this purpose, like phosphate, oxides and hybrid materials.

As a contribution in this field, we report KCoPO4 was elaborated by hydrothermal route at 453 K and the photocatalytic properties were reported for the first time. The compound crystallizes in a hexagonal symmetry with the lattice constants: a = 18.206 (0) Å and c = 8.513 (5). The diffuse reflectance gives an optical transition at 1.82 eV, directly permitted due to the degeneracy lifting of Co2+: 3d7 in tetrahedral site. The SEM image displayed a hexagonal section of regular grains where the elements of the sample corroborate the EDX analysis. The phosphate is stable at neutral pH and is successfully tested for the oxidation of methyl violet (MV). The flat band potential 0.62 VSCE was determined from the capacitance-potential graph in Na2SO4 medium. The valence band deriving from O2–: 2p character (2.24VSCE / 6.99 eV) has a strong oxidizing ability to mineralize the dye by •OH radical. More interesting, we optimized the experimental conditions like the catalyst dose, pH and radiation sources. The best result with a degradation of 97 % was reached for a solid /liquid ratio (2:1) while 94 % is obtained for pH 10.

Biography:

Bagtache Radia completed her doctorate at the University of Science and Technology Houari Boumediene (USTHB) at the Faculty of Chemistry. In 2016, she completed her habilitation in the same university under the theme: preparation of different semiconductors and photocatalytic application. And now she holds the position of professor and she has published more than 40 articles in renowned journals

Michael McCoy
Executive Director Metro Waste Authority, USA

Increase Commodity Capture and Marketability through Unique Disposal Outlets

Since implementing source separated drop-offs for cardboard, Metro Waste Authority has captured an additional 2,000+ tons of OCC. In 2019, when the first drop-offs were placed, residents could only recycle this material via curbside cart. We knew there was an untapped market for apartment dwellers, small businesses, and residents who did not want to cut the material down small enough for the cart. In our first year, 28 tons of material was collected via the drop-offs. Since launching the program, more than 20 containers have been placed and more than 700 tons per year is consistently captured. The high-quality material led to a direct contract with a mill that guarantees pricing and an outlet for sales. In addition to community drop-offs, the agency has expanded to offer various sized containers to small businesses and even placed balers to capture greater quantities of material. Through working with small businesses, we have discovered and helped overcome many obstacles related to recycling integration; ensuring this material is captured for recycling while diverting it from the landfill and elevating our commodity offerings. This model can easily be implemented by any sized organization and has proven a valuable tool for capturing material and meeting the needs of niche markets.

Key Words: Cardboard, OCC, Valuable, Commodity, Solution

Biography:

Michael McCoy was named Executive Director of Iowa's largest solid waste agency in January 2016. McCoy works closely with staff to identify unique solutions for common industry challenges. While his professional and academic experiences have helped shape his vision for the organization, his practical credentials have allowed him to provide hands-on leadership for the organization's operations.

FATMA ERTÜRK
Dokuz Eylül University, Buca Faculty of Education, Turkey

Sustainable Recycling in a Cosmopolitan World: Technological Recycling Bins

In our globalized and increasingly cosmopolitan world, influenced by migration, this project has been developed to create a sustainable environment by making recycling and waste management processes more efficient in diverse communities. Our aim is to establish an effective and efficient waste segregation system using innovative technology in mixed communities to reduce environmental pollution, protect natural resources, and safeguard the planet.

With this goal, we are utilizing the Raspberry Pi system in our Teknofest project, developed based on Turkey's national technology initiative and the presidential zero waste program. The innovative aspect of the Raspberry Pi system ensures that users dispose of their waste in the correct bins.

This project offers numerous benefits, including environmental protection through pollution reduction, conservation of natural resources, economic gains from recycling, increased public awareness and education, enhanced community engagement, technological innovations, and support for sustainable development. Additionally, it plays a significant role in combating climate change by contributing to the reduction of greenhouse gas emissions through effective waste management and recycling strategies, which can be a solution to the climate crisis.

Biography:

Fatma Ertürk, 34 years old, is a graduate student in "Environmental Education" at the Buca Education Institute of Dokuz Eylul University and a student in "Web Design and Coding" at Anadolu University. She is also a primary school teacher in private schools, a volunteer at the Turkish Technology Team Foundation, and interested in artificial intelligence. She has received training in "Artificial Intelligence and Digital Content Development" from the Continuing Education Center at Ege University. Her master's thesis focuses on "Examining the Awareness Levels and Metaphorical Perceptions of Teacher Candidates Regarding the Environmental Impact of Cigarette Butts." She, along with 2nd-grade student Arhan Akçıl, advanced to the semifinals in the Teknofest competition with their Sustainable Recycling project. She has also led a primary school-level eTwinning project titled "From Water to Energy" with Romania and Greece. Additionally, she has been playing the ney since 2007, is interested in Turkish music, and received a plaque from Celal Bayar University for her music performance

Dai-Yeun Jeong
Director of Asia Climate Change Education Center, South Korea
Emeritus Prof at Jeju National University, South Korea

A Framework of Recycling and Waste Management for Establishing Resource Circulation Society

Natural resources are not currently being circulated as their original circulation system in natural state. Its main reason is caused from the unbalance between the use of natural resources and the treatment of wastes discharged. This unbalance threatens not only the self-regulating system of nature, but also the existence of human life.

In this context, this paper aims at developing a framework of recycling and waste management for establishing resource circulation society. For achieving the objective, this paper will be composed of five parts as below.

Part 1: <The concept of resource> will be reviewed from two academic fields – resource economics and environmental sociology. The two have significantly different conceptual definitions of what resource is.

Part 2: <What resource circulation society is> will be introduced in terms of three aspects. They are the concept and aim, key strategies and implications, and empirical cases being promoted to achieve a resource circulation society.

Part 3: <Current status of recourse circulation at a global level> will be critically reviewed from three aspects. One is a review using individual indicator, another one is a review using a synthetic indicator, and the other one is to examine the limitations inherent in the existing strategies being launched for establishing resource circulation.

Part 4: <A desirable direction of recycling and waste management as a resource circulation society> will be established as a framework being composed of four phases. The 1st phase is <identifying the mechanism of resource use and waste discharge>. The 2nd phase is <establishing policies on resource use and waste discharge identified in the 1st phase>. The 3rd phase is <introduction of governance to policy-making process>. The 4th phase is <developing a framework of recycling and waste management for establishing resource circulation society> on the basis of the findings from the above three phases.

Part 5: As a concluding remark, <what capacity should be built in relation to establishing resource circulation society> will be examined. This is because, for example, finance and advanced technologies, and cooperative network, etc. are required for establishing and/or implementing the policies of recycling and waste management for establishing resource circulation society.

Biography:

Dai-Yeun Jeong is presently the Director of Asia Climate Change Education Center, an emeritus professor at Jeju National University in South Korea, and the Acting Director at Jeju Secretariat of UNESCO World Network of Island and Coastal Biosphere Reserves. He received BA and MA degree in sociology from Korea University (South Korea), and PhD in environmental sociology from University of Queensland (Australia). He was a professor of environmental sociology at Jeju National University (South Korea) from 1981 to 2012. His past major professional activities include a teaching professor at University of Sheffield (UK), the president of Asia-Pacific Sociological Association, a delegate of South Korean Government to UNFCCC and OECD environmental meeting, and a member of Presidential Commission on Sustainable Development Republic of Korea, etc. He has published 60 environment-related research papers in domestic and international journals and 13 books including Environmental Sociology. He has conducted 100 unpublished environment-related research projects funded by domestic and international organizations.

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Sequential Extraction of Critical Metals from Processed Spent Lithium- Ion Batteries Using Solvent Membrane Based Process

Production of critical metals in a large scale is the utmost concern of many industries. Most metallurgical separation involved solvent extraction to achieve purified metal products but globally, the common practices involved batch and mixer settler operation which are outdated in the context of economic, cost and timing. However, the effectiveness of novel solvent-based membrane separation for the recovery of critical metals from mixed metals leached solution was performed. The processed lithium black mass leached sulphate solution contains 1450 mg/L Ni, 945 mg/L Co, 600 mg/L Mn, with metal impurities 124 mg/L Cu, 110 mg /L Al and 102 mg/L Fe. In the first stage, 99.9 % Mn and metal impurities (Cu, Al, and Fe) were selectively extracted using 10 % v/v D2EPHA at flowrate (Organic: Aqueous phase)-1:1ml/min. Metal impurities were selectively stripped from the extractant in two stages using Na2S3O3 solution and acidified deionized H2O, retained manganese was selectively stripped using 0.5 M H2SO4 as 98.9 % purified MnSO4 solution at (Organic: Aqueous phase)-1:1ml/min. The extractant was regenerated by stripping with 1.0 M C2H4O2 acid and reconditioning using deionized H2O. Selective separation of cobalt (99 %) from nickel in the raffinate was achieved using 20 % v/v saponified CYANEX- 272 at pH3.0 and flowrate (Organic: Aqueous phase)-1:1ml/min. Under this condition, 98.9 % Co as sulfate solution was obtained and the raffinate is Ni-rich sulfate solution.

Biography:

Dr. Emmanuel Ayorinde Ajiboye is an extractive metallurgist and his research focused on leaching of metals from primary and secondary materials, separation and purification of mixed metals leached liquors via solvent extraction, ion exchange, advance membrane, and electrometallurgy. Dr. Ayorinde obtained B. Tech and M. Tech in Industrial Chemistry from Federal University of Technology in Nigeria. His PhD was funded by TWAS-CSIR at CSIR-Institute of Minerals and Materials Technology, India and got awarded by the Federal University of Technology, Akure, Nigeria in 2021. Dr Ajiboye joined Argonne National Laboratory as postdoctoral researcher for critical materials batteries recycling in January 2023.

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Challenges Of Medical Waste Management In Resource-Limited Healthcare Facilities, South Africa

Many developing countries face various challenges in managing medical waste properly, and most of these challenges lie within the healthcare facilities. This study was conducted to investigate the challenges of effective management of medical waste in Vhembe District from the perspective of healthcare workers. The ethical clearance (SHS/18/PH/07/0405) and permission (LP_201805_011), were obtained including permissions from District, hospitals, clinics and community health centres where data were collected. The convergent parallel approach of mixed-method design was adopted. In-depth interviews were conducted with managers, infection prevention and control coordinators and environmental health practitioners of 15 public healthcare facilities in the district to gain insight into the challenges they identify in their respective healthcare facilities. A self-administered questionnaire was employed to obtain data from medical waste generators and handlers. Qualitative data were thematically analysed, and the Statistical Package for the Social Sciences version 25 was used to analyse the quantitative data. The challenges identified by healthcare workers include poor understanding of medical waste management guidelines and poor compliance; lack of regular training; poor attitudes of medical waste generators; insufficiency of waste management equipment and sub-standard central storage rooms. Most of the challenges were found to be linked to inadequate training of healthcare workers. For effective management of medical waste, efforts should be intensified towards adequate training of healthcare workers and provision of necessary equipment.

Keywords: Healthcare workers, healthcare facilities, medical waste management, low-resource settings, public health

Biography:

Takalani Tshitangano, a Professor at the University of Venda, Department of Public health, is a mid-level to established researcher in the field of health promotion and infection control, whose work include serving as a board member of the Public Health Association of South Africa, member of the National Health Research Committee, and member of the Limpopo Provincial Health Research Committee.

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