WEBINAR HIGHLIGHTS: INNOVATIVE PATHWAYS IN SUSTAINABLE PRECIOUS METALS REFINING

Dr Ashot Navasardian, Founder, Puremelting Inc.

Introduction to Pure Melting Inc. and Founder

The webinar featured **Dr. Ashot Navasardian,** the visionary founder of **Pure Melting Inc.,** an innovative start-up focused on transforming e-waste recycling. With a robust background in industrial manufacturing and technologies for precious and rare earth metal extraction, Dr. Navasardian has spearheaded advancements in eco-friendly smelting technologies and hydro-metallurgical processes. A prolific contributor to the field, he has published 19 scientific papers on industrial manufacturing, establishing himself as a leader in innovative refining methodologies.

Innovative Methods for Refining Precious Metals

Dr. Navasardian highlighted the challenges of refining diverse waste types containing precious metals, such as industrial and plastic waste, solar scrub, and automotive and electronic components. He emphasized the low concentrations of gold, silver, and platinum group metals (PGMs) in such waste, which results in inefficiencies and financial losses for refiners.

To address these challenges, Pure Melting Inc. has developed a patented technology, Intermetallurgy, which utilizes low-melting-point alloys to dissolve waste, separate metals from plastics and ceramics, and extract precious metals in the form of intermetallic components. This process enables the efficient processing of large volumes of waste while minimizing material loss, making it a sustainable and economically viable solution.

Challenges in Current Recycling Methods
Current scrap separation and recycling methods, such as mechanical separation and hydrometallurgical leaching, face limitations in handling high volumes and preserving precious metal value. Dr. Navasardian discussed the inefficiencies of these methods, which often result in significant material losses. He introduced Puremelting as a scalable alternative capable of addressing these issues while aligning with sustainability goals. He also highlighted the need for partnerships to build a demonstration facility and scale up operations.

Sustainable Refining and E-Waste Management
Dr. Navasardian emphasized the importance of sustainability in refining processes to meet market demands, ESG standards, and evolving regulations. He outlined the limitations of traditional pyro- and hydro-metallurgical methods in handling mixed waste and achieving ecological benchmarks.
Key challenges in the industry include financial inefficiencies, health risks, high carbon footprints, and the need for advanced selective extraction methods. He elaborated on the process of adding zinc, tin, and bismuth to e-waste for separating copper and precious metals and addressed the complexities of recovering tin from the remaining materials.

Electromagnetic Crystallization and PGMs
The webinar also explored electromagnetic crystallization, a novel technology capable of selectively extracting precious metals from copper, which could revolutionize the recycling of PGMs. Dr. Navasardian emphasized the growing demand for PGMs and the necessity for sustainable practices to meet future industry requirements.

Recycling Solar Panels and Use of Solvents
The potential use of solvents in recycling solar panels was another key topic. Dr. Navasardian explained how copper salts could serve as effective solvents to recover silver and other valuable materials from solar panel waste. He underscored the importance of environmentally friendly recycling solutions and shared his progress in assembling prototypes for this purpose. However, he clarified that his technology is best suited for solid mixed waste, such as electronic and automotive components, rather than chemical or pharmaceutical waste.

Conclusion
The webinar concluded with a focus on the significance of advancing eco-friendly solutions in e-waste recycling. Dr. Navasardian expressed his commitment to addressing the challenges of precious metal recovery and emphasized the potential for collaboration and innovation to shape the future of the industry. He thanked participants for their engagement and expressed optimism about the role of sustainable technologies in creating a cleaner, more resource-efficient world.

Key Takeaways

- **Intermetallurgy Technology:** Offers a sustainable and scalable method for refining precious metals from diverse e-waste.
- I**ndustry Challenges:** Includes inefficiencies in traditional methods, financial constraints, and environmental concerns.
- **Sustainability Focus:** Aligning recycling processes with ESG standards and ecological goals.
- **Future Innovations:** Technologies like electromagnetic crystallization and solvent-based recycling of solar panels could transform the industry.

This webinar highlighted the transformative potential of innovative refining technologies, offering hope for a more efficient and sustainable approach to e-waste management.

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