Government of Canada
Embassy of Canada

Gouvernement du Canada
Ambassade du Canada

Canadian Battery Technology R&D Mission to Korea

@InterBattery 2020

(October 21-23, 2020, Virtual)

Canadian Participants Profile

1. American Manganese Inc.
2. Calogy Solutions
3. GBatteries Energy Canada Inc.
4. Hypertronic, Technologie
5. Li-Cycle Corp.
6. Lithion Recycling Inc.
7. National Research Council of Canada (NRC)
8. Nouveau Monde Graphite Inc.
9. Polar Sapphire Ltd.

For meeting requests and other supports, contact
Hyun-Ju Lim
Trade Commissioner (Science, Technology and Innovation)
Embassy of Canada
주한캐나다대사관 임현주 상무관
Hyunju.lim@international.gc.ca
Office: 02-3783-6057

1. American Manganese Inc. www.americanmanganeseinc.com
Social Media
Twitter: @AmerManganese
LinkedIn: linkedin.com/company/american-manganese-inc
Facebook: /AmerManganese
YouTube: American Manganese Inc

회사소개:

American Manganese has developed the patented RecycLiCo™ process that offers a closed-loop and environmentally friendly solution for the recycling of electric vehicle battery materials. The process achieves up to 100% recovery and high purity of materials such as lithium, cobalt, nickel, manganese, and aluminum. The RecycLiCo™ process was designed with the goal to produce recycled cathode active material that could be seamlessly integrated into the re-manufacturing of battery cathodes using minimal processing steps.

주요사업영역:

- Lithium-ion battery recycling
- Critical material recovery

기술 R&D 협력 희망분야:

- Collaboration with cathode material suppliers and lithium-ion battery manufacturers, to obtain sample feedstock of scrap battery material and recycle using the company's RecycLiCo™ process.
- American Manganese would produce a recycled product to be validated by the OEM and potentially integrated in the manufacturing of new lithium-ion batteries.
- Co-develop recycling technology to be integrated with the cathode material supplier and/or lithium-ion battery manufacturing process.
- Cathode and lithium-ion battery manufacturer validation of the recycled product's purity and particle morphology for suitable integration in re-manufacturing lithium-ion battery materials

당사의 경쟁우위:

- Patented
- Closed-loop and environmentally friendly
- Achieve up to 100% recovery and 99.99% purity of recycled products
- Pilot plant tested
- Conceptual design for a 3 tonne/day commercial plant
- Produce cathode precursor material
- Minimal processing steps

주요 고객사/파트너:

Kemetco Research Inc.

기술개발 및 국제 파트너쉽 현황:

- Completed recycling test work on sample cathode material from international battery manufacturers
- Signed Memorandum of Understanding with Battery Safety Solutions to develop a recycling collaboration and go-to market strategy for end-of-life lithium-ion batteries
- Partnered with U.S. Department of Energy and Critical Materials Institute to develop a complete electric vehicle battery recycling solution

미팅 목적:

To establish a partnership with a leader in secondary battery manufacturing to validate and co-develop American Manganese's patented recycling process (RecycLiCo™)

2. Calogy Solutions www.calogysolutions.com
Social Media
LinkedIn https://www.linkedin.com/company/calogysolutions

회사소개:

Founded at the Université de Sherbrooke in 2017, Calogy Solutions has developed a novel thermal management solution to address the global issue of overheating Li-ion batteries used in electric vehicles. The patent-pending technology makes it possible for batteries to be cooled or heated at a low production cost compared to other alternatives currently on the market. Ultimately, this will be significant for the industry: by maintaining the optimal temperature range for the battery's cells, the innovation will improve safety, increase vehicle autonomy, and extend life cycle while reducing the initial cost of electric vehicles.

주요사업영역:

Battery thermal management (TMS)

기술 R&D 협력 희망분야:

We are open to partnerships to integrate our TGP and TMS in battery packs for any kind of electric transport. We are also interested in doing collaborative R&D product development projects with OEMS and battery pack manufacturers. We hope that through a partnership we may increase both our expertise in battery pack manufacturing on a module and pack level, and our credibility as thermal management experts. We are looking to also increase the awareness of the critical role thermal management plays in battery pack performance as well as other applications in the electric transportation industry.

당사의 경쟁우위:

We are developing a battery thermal management system to passively regulates the temperature of a battery pack, optimizing the operating temperature of the battery in both hot and cold climates. Our TGP (Thermal Ground Plane) is inspired by the heat pipe concept, allowing for our technology to be both very light; adding little extra weight to the battery pack, and allowing for a hermetic battery pack design; increasing safety by decreasing the risk of thermal runaway. The integration of our technology in a battery pack increases the battery's lifespan by up to 2 years and increases the autonomy of the battery by an estimated 20% all while being a cost effective. The integration of our technology and BMS algorithms can provide our clients with real time data about the status of their battery health.

주요 고객사/파트너:

Parnter- Ecotuned

기술개발 및 국제 파트너쉽 현황:

Calogy is currently in the pre-commercialization phase and is working with partners to bring its technology to the market. As our TMS technology is not an off-the-shelf part and needs to be integrated in the battery pack, we work closely with our partners in order to design and implement our technology based on our clients needs.

미팅 목적:

Our objective is to meet the Korean companies to present our technology and find co-development partners.

3. GBatteries Energy Canada Inc. www.gbatteries.com
Social Media
https://www.linkedin.com/company/gbatteriesenergy
https://twitter.com/GBatteries

회사소개:

GBatteries is an advanced battery charging company pioneering a technology that allows the ultra-fast charging of lithium-ion (Li-ion) batteries without reducing cycle life, changing the battery chemistry, or altering the manufacturing process. They are working toward enabling electric vehicles (EVs) to charge as fast as it takes to fill up a tank of gas.
The charging protocol uses adaptive pulses as an alternative to CCCV (constant current, constant voltage). Unlike the traditional approach, it addresses the battery conditions for achieving ultimate performance. The technology consists of two parts: 1) proprietary algorithms, designed to generate unique charge pulse profiles; and 2) novel hardware that delivers the precise pulses at high frequency.

주요사업영역:

Energy Storage – GBatteries is an advanced battery charging technology company that ultra-fast charges Li-ion batteries without compromising the cycle life. Primary applications are transportation (electric vehicles and micro-mobility), consumer electronics, power tools, and drones.

기술 R&D 협력 희망분야:

We want to scale our 'fast charge, long life' battery technology and build on the results that we've achieved in our lab to larger electric vehicle packs. The goal is to commercialize the technology in electric vehicles. We seek joint collaboration opportunities to enable ultra-fast charging of vehicles, devices, or tools utilizing our technology. We are looking for expertise in battery charging technology and those interested in ultra-fast charging, so that we can advance our solution together.

당사의 경쟁우위:

We have the only demonstrated technology capable of ultra-fast charging Lithium-ion batteries (50% capacity in 5 minutes and 100% in 10 minutes) without compromising battery lifespan or changing the chemistry. Unlike our competitors, we are charging off-the-shelf lithium-ion (Li-ion) batteries more efficiently using a combination of software and hardware. Since our technology works with unaltered Li-ion batteries that have been produced, validated, and tested by battery manufacturers, it has the potential to scale easier than some of the other battery technology being explored.

주요 고객사/파트너:

Confidential.

기술개발 및 국제 파트너쉽 현황:

We are working on several technology validation projects with global automotive, power tools, and consumer electronics manufacturers.

미팅 목적:

Our objective for participating in PDA is to create joint partnerships with South Korean organizations in the transportation/mobility, consumer electronics or tools industries, and battery cell manufacturers. Joint partnerships are essential to validate our technology which is the next step required towards commercialization.

4. Hypertronic, Technologie www.hypertronic.ca
Social Media
https://www.linkedin.com/company/technologie-hypertronic

회사소개:

Hypertronic is dedicated to the design of electronic products and solutions of the future, supporting organizations from ideation to mass production. We stand out thanks to our unique expertise in the rail, automotive, aerospace, medical, smart cities and other innovative technologies, an advanced sense of innovation and exceptional customer service.
Our mission is to design the innovative mobility of tomorrow while contributing to the evolution of mobility in order to improve people's quality of life and reduce the environmental footprint.

Our technologies and solutions are among others:

• Modular battery module and BMS platform.

• Versatile Battery Charger Platform.

• Intelligent overcurrent protector with supervision.

주요사업영역:

Multidisciplinary engineering service.
Turnkey manufacturing of tailor-made electrical / electronic products
Custom test equipment.

기술 R&D 협력 희망분야:

- Intelligent overcurrent protector with supervision.

• Battery module platform and BMS.

• Battery charger platform.

• TCU electronic card with software interface for test automation.

당사의 경쟁우위:

We have unique expertise in the transportation market, particularly in the on-board systems that integrate various components such as power sources, battery storage and charger. The systems also integrate electromechanics, manufacturing and test automation.

주요 고객사/파트너:

Wabtec, Volvo, Alstom, Amtrak, MBTA, TTC, Lion Electric, Thales, Bombardier, Airbus

기술개발 및 국제 파트너쉽 현황:

We are an engineering firm that has been developing for several years different products and turnkey technologies to our customers who now allows us to commercialize such products and technologies. We are at the beginning of this stage.

미팅 목적:

Create partnerships for the development and commercialisation of battery products and power monitoring by integrating new technology and offering our expertise to others clients.

5. Li-Cycle Corp. https://li-cycle.com
Social Media
Twitter: https://twitter.com/li_cycle
LinkedIn: https://ca.linkedin.com/company/li-cycle-corp.

회사소개

Li-Cycle is on a mission to leverage its innovative technology to provide a customer-centric end-of-life solution for lithium-ion batteries and create a secondary supply of critical battery materials. The world needs improved technology and supply chain innovations to better manage the end-of-life of these batteries, and to meet the rapidly growing demand for critical and scarce battery-grade materials through a closed-loop solution.
Li-Cycle's Spoke-and-Hub technologies are economically viable, safe, and environmentally friendly processes that can recycle all types of lithium-ion batteries. The company's industry-leading processing technologies uniquely position it to be a key player in supporting the growing international movement towards zero carbon technologies and creation of a circular economy for lithium-ion batteries.

주요사업영역

Through its unique Spoke and Hub model Li-Cycle can recover 95+% of all components within lithium-ion batteries, producing battery-grade chemicals which are returned back to the economy, thereby creating a sustainable closed-loop supply chain

- Li-Cycle's patented Spoke technology intakes all li-ion battery chemistries at any charge, without manual sorting, discharging, or dismantling, and produces an intermediate product known as black mass which can be sold on to refiners, or further processed by Li-Cycle's Hub facility in the medium term
- Li-Cycle's patented Hub technology intakes the black mass produced at Spoke plants globally, outputting high-purity battery chemicals with a 95+% recovery rate, returning materials to the economy and closing the loop on the battery supply chain

기술 R&D 협력 희망분야:

Li-Cycle is highly interested in a R&D collaboration to gain further intelligence on the South Korean market, as well as gain insights from an experienced partner to inform the future commercialization of Li-Cycle's Spoke technology in the region. While Li-Cycle's technology has been designed with scalability and transferability in mind – as demonstrated by our ability to intake the full spectrum of lithium-ion battery chemistries at the Spoke – we believe that a local R&D collaboration would present an opportunity for Li-Cycle to further tailor its operations to local market dynamics, and provide further validation for our technology to aid in securing suppliers and end-product customers in the region.

당사의 경쟁우위

Li-Cycle's recovery rates position the company as a leader in the global battery recycling industry. The company's ability to recover the full gamut of materials from lithium-ion batteries – particularly lithium – is a key differentiator and is unmatched in the market today, where other players are often singularly focused on optimizing recoveries of one material, such as cobalt. Finally, as an alternative to primary supply in the battery supply chain via traditional mining and refining projects, Li-Cycle offers substantial environmental benefits and significantly improved capital efficiency, driven by Li-Cycle's robust recovery rates.

주요 고객사/파트너:

Clients: Confidential

Partners and Affiliations:

- MaRS
- Responsible Battery Coalition
- NAATBatt International
- CALSTART
- Suppliers Partnership for the Environment
- Business Development Bank of Canada (BDC)
- Sustainable Development Technology Canada (SDTC)
- TechMet

기술개발 및 국제 파트너쉽 현황:

While the company has initially been focused on the North American market, international expansion with a particular focus on Asia is central to Li-Cycle's growth strategy over the coming years. At present, Li-Cycle has commercialized its Spoke technology at its facility in Kingston, ON and anticipates opening a second commercial-scale Spoke facility in Rochester, NY by year-end 2020. Additionally, Li-Cycle has successfully completed a pilot project for the Hub facility and is currently progressing towards constructing its first commercial Hub, which will also be based in Rochester, NY.

In parallel, Li-Cycle has been actively engaged in discussions with potential international partners to expand its facility footprint through a series of joint venture agreements. Prospective partners have generally been highly receptive to the capabilities and commercial potential of Li-Cycle's technology. Locally in South Korea, Li-Cycle has local team members based in South Korea to assist in engaging in discussions with potential partners, with favourable progress to date. Therefore, while Li-Cycle has not yet commercialized its technology in international markets, we are encouraged by these ongoing discussions that we will be able to successfully execute our international roll-out plan.

미팅 목적:

One of the key priorities for Li-Cycle over the short- and medium-term is executing the company's international growth strategy and growing the global capacity footprint. South Korea and the broader Asian region are priority markets within Li-Cycle's global roll-out strategy, given favourable dynamics for the continued adoption of EV vehicles and the resulting need for a closed-loop solution to the end of life battery problem.

In working with a potential R&D partner, Li-Cycle would be seeking to refine its local market intelligence, validate the viability of the company's technology against nuances in the local market, and look to build on the R&D collaboration to facilitate additional expansion and partnership opportunities in the region.

6. Lithion Recycling Inc. www.lithionrecycling.com
Social Media
https://www.linkedin.com/company/recyclage-lithion/?originalSubdomain=ca

회사소개

Lithion Recycling has developed an efficient & disruptive process for recycling lithium-ion batteries. This new process allows up to 95% of the battery components to be safely recovered & treated so that they can be reused in the battery supply chain—a concrete way to close the loop of battery life-cycle. The technology put forward by Lithion Recycling uses an innovative combination of processes, based on hydrometallurgy. The result is a size and chemistry agnostic process emitting very low GHG emissions.

주요사업영역

Lithium-ion battery recycling
Extracting strategic and valuable metals contained in these batteries
Reuse these materials in battery manufacturing

기술 R&D 협력 희망분야:

Through its hydrometallurgy process, Lithion produces nickel, cobalt and manganese sulfates as well as lithium carbonate. Preliminary results obtained by Lithion confirmed battery-grade was obtained and wishes to work with key players in the industry to test its products in real life environment and confirm that specifications meet industry requirements. By doing so, Lithion could provide a better fit-for-market solution as each producer has its own specifications for raw materials supply.

We seek partners for:
- performance testing of Cathode Active Materials (CAM) and Precursors (PCAM) made with recycled components, and
- development of new cathode chemistry containing recycled products from Lithion's technology.

당사의 경쟁우위

- Unique automated dismantling process for lithium-ion batteries.
  o Accepts all li-ion chemistries and sizes
  o No discharging required
- We operate our own hydrometallurgical pilot-plant
  o Extensive know-how in process engineering and extractive technologies
  o Design, engineering and construction done by our sister company Seneca experts-conseils. Founded in 1997, their team of over 85 engineers is there to support Lithion since the beginning and has broad experience in hydrometallurgy processes
- Licensing business model for technology deployment
  o Tackle the recycling challenge more rapidly
  o Federate and leverage the forces of regional forces for collection and treatment of the batteries

o Limit transportation of end-of-life batteries

- Total recovery of 95% of the battery components and producing battery-grade materials

주요 고객사/파트너:

Our pilot-plant partners are Call2Recycle, Hydro-Quebec, CEPROCQ and Seneca experts-conseils.

기술개발 및 국제 파트너쉽 현황:

Our sister company Seneca has implemented processing technologies and innovations related to industrial materials in more than 15 countries worldwide. Our founders as well as our management team also has multiple experiences in international development. For Lithion, we have been attending trade shows and conferences in the US and Europe for more than two years to gain market intelligence and meet with potential partners. We've also been in contact and discussion with various players of the Li-ion battery ecosystem.

미팅 목적:

-Find strategic partners to validate our battery-grade products, co-develop our products with them

• Learn about raw materials specifications needed by South Korean players

• Promoting Lithion's recycling services on the South Korean market through licensing of our technology

7. National Research Council Canada (NRC)
https://nrc.canada.ca/en/research-development/research-collaboration/research-centres/energy-mining-environment-research-centre

Social Media
https://www.linkedin.com/company/national-research-council
https://twitter.com/NRC_CNRC

캐나다국립연구위원회 및 위원회의 배터리 연구 소개

The NRC is Canada's largest federal research and development organization. The NRC partners with Canadian industry to take research impacts from the lab to the marketplace, where people can experience the benefits. With its head office in Ottawa, the NRC runs various programs and research labs across Canada to optimize its collaboration with industries.

Energy, Mining, and Environment (EME) and Automotive and Surface Transportation (AST) are two of the Research Centres in NRC that perform battery R&D activities. Our teams have over 30 years of experience in research and development of Li-ion battery technologies with a vision to advance Canada's industry. We have extensive experience in developing, synthesizing, characterizing Li-ion battery materials and components (advanced cathodes, anodes, and liquid and solid electrolytes), as well as integration into end use applications such as electric vehicles, stationary energy storage, and aerospace. Our Research Centers carry out R&D on battery system testing and standards development, thermal event propagation, scale-up and prototyping of R&D and industrial sized pouch cells, electrochemical and thermal modeling of cells and packs, and Li-ion battery recycling. NRC has also developed a 2325 coin-cell platform, which has been used by many academia and government laboratories for battery R&D. Increasingly effort is also focused on the production of materials for lithium ion batteries from Canadian resources and recycled battery materials including graphite, lithium, nickel, and manganese.

주요 R&D 영역

Across multiple teams, programs, and research centres, NRC works with government, academic, and industrial stakeholders to perform research and development, support technology innovation, and build and maintain science infrastructure.

NRC works with many Canadian firms, helping them bring new technologies to market. NRC provides supports at all levels from low to high technical readiness level (TRL), however currently mainly focusses on developments from TRL 3 to 7.

While the NRC is open to discussions on various battery R&D ideas, we have prepared a few sub-sector factsheets or information packages as follows. Please contact hyunju.lim@international.gc.ca to receive further information.

- Solid-State Batteries
- Degradation Mechanisms including battery state of health and state of charge
- End-of-Life Li-ion Batteries: Reuse and recycling
- LiBTec, the industrial R&D group in Li-ion battery
- Performance and abuse testing of cells, modules and packs
- Materials Development: High energy anodes and cathodes

- Scale-up and prototyping of R&D and industrial size pouch cells

기술 R&D 협력 희망분야:

Our battery groups are currently looking for collaborators who have interest in Li-ion battery materials, specifically on high capacity anode materials, high energy cathode materials, Solid State Electrolyte for Li-ion and Li metal batteries, and Li-ion recycling. However, the technologies we are seeking are not limited, we are open to R&D collaboration in any technologies related to Li-ion battery materials, testing, modeling and recycling.

위원회의 배터리 소재 연구 역량 및 경쟁우위

NRC has the capability to develop, synthesize, characterize and test materials and components for Li-ion batteries. We are the biggest research organization in Canada, and we have an extensive capability in materials characterization, such as SEM, TEM, XRD, XPS, potentiostat/galvanostat, impedance spectroscopy, in-situ measurements, FT-IR, TGA, DSC, etc., in materials synthesis and processing can be performed in house via a variety of controlled routes, such as co-precipitations reactions, solid-state, high energy ball-milling, polyol, solvothermal synthesis and other mechanical and thermal processes. These advanced materials can be manufactured and tested in coin cells and pouch cells in our facilities across the country. The assembled cells are tested in the small scale battery labs where more than 300 cells can be tested under various conditions at controlled temperatures from -30 to +60 ^{o}C. High Precision cyclers are also available. NRC holds thousands of patents in variety of fields that can be licensed to SMEs.

주요 고객사/파트너:

NRC works with other government departments within Canada (NRCan, Transport Canada, DND, etc.), as well as numerous academic and industrial partners. Internationally, NRC is engaged in a number of key collaborations with organizations such as the IEA, World Bank, and other national labs.

미팅 목적

NRC is looking for R&D collaborators in South Korea, who in partnership can advance current Li-ion battery technologies. There is a history of collaboration between Canadian and Korean research centres, which NRC is looking to enhance in the area of Li-ion batteries, including both in-kind/in-kind collaboration as well as potential nationally funded activities. Of specific interest is to grow the Canadian Li-ion battery research and development group (LiBTec), to include additional Canadian and Korean SMEs, as well as larger Korean battery manufacturers, who have an interest in Canadian materials and markets.

8. Nouveau Monde Graphite Inc. www.NouveauMonde.ca
Social Media
www.facebook.com/tsxnou/
https://twitter.com/TSX_NOU
www.linkedin.com/company/2698448
www.youtube.com/channel/UCv8ohfCrNXjARDrmzzS6qHQ

회사소개:

Serving Tomorrow's Economy: Nouveau Monde Graphite sets to become a major producer of natural flake graphite, which is anode material for Lithium-Ion batteries and other products of value-added graphite, while having the lowest environmental footprint of industry. The Company is committed to the sustainable development of its flagship property, the mining project in Matawinie, and in the implementation of its business strategy for the second transformation of graphite. Nouveau Monde Graphite plans to electrify all of its activities, which should make it the world's first all- electric open-pit mine.

주요사업영역

Responsible and carbon neutral extraction of natural graphite (first 100% electric open pit mine in the world), production of graphite concentrate for traditional markets and development of value-added products, including anode material for lithium-ion batteries for markets niche.

기술 R&D 협력 희망분야

The production of anode material requires several stages of processing the concentrate natural graphite to ensure maximum purity (99.95% and above) and conductivity. Nouveau Monde Graphite is developing an integrated business model to cover not only the extraction of the mineral, but also its micronization, spheronization, purification and coating: four complementary processes to obtain the required properties and performance as anode material.
In addition, due to its properties of high conductivity and high thermal resistance, graphite is a highly versatile mineral to serve a variety of industries, from steel mills to telecommunications, clean technologies and electric transportation. Thanks to its internal R&D technical team and partnerships with renowned research centers, Nouveau Monde is currently developing its portfolio of niche products, anode material, expandable graphite, expanded graphite, in addition to exploring opportunities related to anode recycling and graphene.

당사의 경쟁우위

Thanks to its unique transformation processes and clean hydroelectricity available in Quebec, Nouveau Monde Graphite intends to commercialize carbon-neutral graphite products that will clean up the lithium-ion battery value chain. The spherical graphite market is currently 100% controlled by China; Nouveau Monde allows its clients to diversify their sources of supply while offering a product, developed in an ecological and socio-responsible manner, along with high technological performance.

주요 고객사/파트너

Commercial links established with Traxys and SGL Carbon, and numerous discussions underway with manufacturers of lithium-ion batteries, electric vehicles and refractory materials, in particular.

기술개발 및 국제 파트너쉽 현황:

Battery materials product development is a very R&D intensive activity. Nouveau Monde has multiple ongoing R&D programs internally and externally with Universities in Canada (Sherbrooke U, McGill U, INRS, UQAT) and government institutions like Hydro-Québec research center (IREQ) and NRC-CNRC. In an effort to internationalize our R&D capacity in locations with known expertise in li-ion battery development, we recently started a cooperation with Tsinghua University in China on specific topics related to anode material optimization.

미팅 목적:

We would be very much interested to collaborate with Korean R&D institutions to seek potential partnerships in the field of graphite applications for battery materials, hydrogen fuel cells or expandable/expanded graphite for fire retardants or electronic heat dissipation. It could have the form of joint R&D program, graduate student exchange with one of our partner university or any other appropriate approach.

9. Polar Sapphire Ltd www.polarsapphire.com

회사소개:

Polar Sapphire is a Canadian manufacturer of 3N to 6N High purity alumina by employing a proprietary technology to improve the total costs of ownership for our customers with a factory located in Mississauga, Ontario, Canada. Currently, we successfully developed a pilot line with a capacity of about 150MT a year. We are planning to build a commercial factory with a capacity of 1000MT per year and then to expend the factory to 5000MT battery grade HPA after the initial commercial plant is commissioned.

주요사업영역

Manufacture high purity alumina mainly for lithium-ion battery separators and sapphire for LEds and many others

기술 R&D 협력 희망분야

Aiming to reduce carbon emissions and to protect environment, EV has clear advantages over the combustion engine powered vehicle. The economically and technologically robust batteries play an important role in the EV market. The battery separator is important for the battery performance including safety, energy density and power density.
We are optimizing high purity alumina for battery separator coating application. Seeking collaborations to test alumina BET, particle size distribution, purity, water level, the impacts of impurities in HPA on battery performance and other key parameters required in the application.

당사의 경쟁우위

Our innovative manufacturing process focuses on improving yields and reducing total cost of ownership for our customers.
We combine hydrometallurgy and pyrometallurgy and invent a proprietary technology to perform purification at a lower temperature and with less power, thereby reducing costs and improving the consistency of our product's purity. The produced alumina is the world's highest quality HPA (high purity alumina). The process is environmentally-friendly and low cost effective compare to the traditional alumina processes.

주요 고객사/파트너

-

기술개발 및 국제 파트너쉽 현황

We developed business partnerships in US, EU and Asia. We cooperate with our customers, research institutions and universities to develop the application of our HPA for the separator coating, focusing on cost reduction, thickness uniformity, porosity consistency improvement, thermal and mechanical stability improvement, cycling performance, energy and power density, safety improvement. Besides the use for battery separators, our high purity alumina is used for sapphire growth for LEDs, semiconductors, plasma displays and lasers. These markets are being developed in US, UE and Asia.

미팅 목적:

To expand our business to South Korean lithium-ion battery market; To co-develop the technology and application of alumina for battery separators with Korean partners