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Flow Aluminum, a startup in Albuquerque, New Mexico, has made a major breakthrough in its aluminum-CO2 battery technology after successful tests at the Battery Innovation Center (BIC). The company has confirmed that its battery chemistry works well in a practical pouch cell design, showing it could be a high-performance, cost-effective alternative to lithium-ion batteries. This achievement brings Flow Aluminum closer to commercializing its technology and underscores its advantages in energy density and cost. Visit the Flow Aluminum website to learn more: https://

See Flow Alluminum"s October 3 press release, "Flow Aluminum announces marked advancement in aluminum-CO2 battery technology," reposted below.

FLOW ALUMINUM ANNOUNCES MARKED ADVANCEMENTS IN ALUMINUM-CO2 BATTERY TECHNOLOGY

Latest Performance Tests Propel Start-Up Towards Commercialization in Energy Storage Landscape

Albuquerque, New Mexico - [October 3, 2024] - Flow Aluminum, an Albuquerque-based startup innovating the energy sector with its groundbreaking aluminum-CO2 battery technology, today announced a significant milestone in its development efforts. The company completed a critical testing phase at the prestigious Battery Innovation Center (BIC), where substantial strides were made in validating its aluminum-CO2 battery chemistry within a commercially relevant cell architecture.

Flow Aluminum achieved these results after a series of experiments at BIC confirmed the battery chemistry"s viability in conditions that closely simulate real-world commercial applications. This breakthrough not only brings Flow Aluminum one step closer to full-scale commercialization but also underscores the untapped potential of its aluminum-based battery technology to serve as a high-performance, low-cost, energy-dense alternative to conventional lithium-ion batteries.

“The progress we’ve made at the Battery Innovation Center is a significant step forward for Flow Aluminum,” commented company CEO Thomas Chepucavage. “Thanks to our CTO, Dr. Olaf Conrad, our team, and BIC, we now have a clear path to refine and optimize our technology roadmap, bringing us closer to delivering an aluminum battery that will innovate energy storage applications."

Twelve experiments in total were conducted at BIC. During the final four experiments, incremental improvements were made to the original pouch cell architecture and the assembly procedure to account for the differences between standard pouch cell chemistry and the specifics of Flow Aluminum"s Al-CO2 chemistry.

These improvements demonstrated a full discharge and half charge cycle in the pouch cell configuration, confirming the battery chemistry in commercially relevant cell architecture and clarifying how to design the electrodes for a metal-gas battery. It also confirmed model assumptions regarding the volumetric storage capacity of key battery components, which validate the modeled battery size and capacity for the start-up"s technical product development plan.

Brett Allen, a Battery Engineer at BIC, expressed his excitement about these results, noting, "The Aluminum-CO2 single-layer pouch cell can attain an experimental specific discharge capacity of ~1500 mAh/g_carbon with a stable voltage curve, which is staggering compared against the theoretical capacities of other battery chemistries actively being developed, such as lithium-ion, sodium, or potassium.”

The experimental setup at BIC involved assembling single-layer pouch (SLP) cells with precise dimensions designed to test performance under a range of conditions. Each SLP cell was constructed in a dry room environment, featuring an aluminum anode, a cathode, a separator, and nickel foam. Following assembly, the cells underwent a series of tests that included assessments across various voltage ranges, charging and discharging rates, and soak times. The breakthroughs achieved in the final four experiments provided critical insights, confirming the battery chemistry in a commercially relevant cell architecture and paving the way for further development and optimization.

"We"ve reached a pivotal moment in our development journey," added Dr. Olaf Conrad, Flow Aluminum"s Chief Technology Officer. "Now, our team will continue to define Flow Aluminum"s technology roadmap in our dedicated laboratory designed to advance our metal-gas battery. Most importantly, we"ve created a testing system that mirrors the architecture of our battery, ensuring that all electrochemical tests are directly relevant to the final cell design. This approach will allow us to streamline development and accelerate our path to commercialization."