

C-BATT Utilizes Award-Winning Resin Technology

X-BATT's proprietary resin technology recognized at International Battery Seminar and Exhibit

ORLANDO, FL, UNITED STATES, October 18, 2024 /EINPresswire.com/ -- C-BATT, a joint venture between X-BATT® and CONSOL Innovations, celebrates an important industry recognition of its core technology. The International Battery Seminar and Exhibit selected X-BATT's proprietary resin technology as the winner of Best Poster at its 2024 meeting.

This Polymer Derived Ceramic technology is a key part of C-BATT's innovative anode material, Obsidia™. The silicon oxycarbide (SiOC) based material has been under development for over a decade and has been incorporated by C-BATT as a key component of its high-capacity anode material for some time.

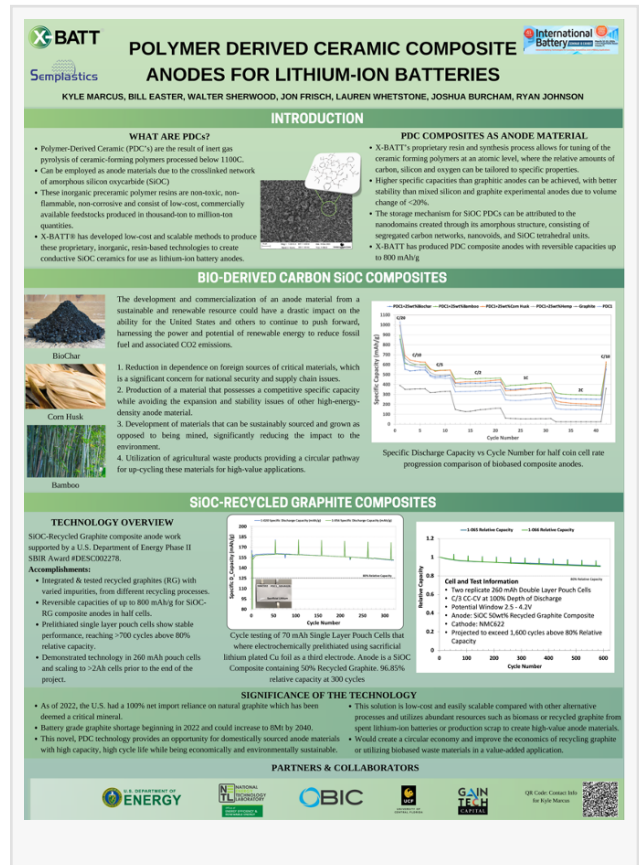
“Recognition of the X-BATT material system at the core of our anode material by the International Battery Seminar and Exhibit is an exciting validation of our technical path, which promises more energy density without the very high costs of other silicon-based anode materials,” said Josh McConkey, the director of commercialization at C-BATT.

The Obsidia™ material is in the advanced stages of commercial development, generating interest from multiple EV OEMs as well as other military and industrial partners.

More information about the technical and economic benefits of this unique material are set to be released by C-BATT soon.

For more information on C-BATT, visit www.cbattmaterials.com

To view or download images, click [here](#).



X-BATT **POLYMER DERIVED CERAMIC COMPOSITE ANODES FOR LITHIUM-ION BATTERIES** International Battery Seminar and Exhibit

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INTRODUCTION

WHAT ARE PDCs?

- Polymer-Derived Ceramic (PDC) are the result of inert gas pyrolysis of ceramic-forming polymers processed below 1100C.
- Can be employed as anode materials due to the crosslinked network of amorphous silicon oxycarbide (SiOC).
- These inorganic preceramic polymer resins are non-toxic, non-flammable, non-corrosive and consist of low-cost, commercially available feedstocks produced in thousand-ton to million-ton quantities.
- X-BATT® has developed low-cost and scalable methods to produce these proprietary, inorganic, resin-based technologies to create conductive SiOC ceramics for use as lithium-ion battery anodes.

PDC COMPOSITES AS ANODE MATERIAL

- X-BATT's proprietary resin and synthesis process allows for mixing of the ceramic forming polymers at an atomic level, where the relative amounts of carbon, silicon and oxygen can be tailored to specific properties.
- Higher specific capacities than graphite anodes can be achieved, with better stability than mixed silicon and graphite experimental anodes due to volume change <math>< 20\%</math>.
- The storage mechanism for SiOC PDCs can be attributed to the nanodomains created through its amorphous structure, consisting of segregated carbon networks, nanotubes, and SiOC interstitial units.
- X-BATT has produced PDC composite anodes with reversible capacities up to 800 mAh/g.

BIO-DERIVED CARBON SiOC COMPOSITES

The development and commercialization of an anode material from a sustainable and renewable resource could have a drastic impact on the ability for the United States and others to push forward, harnessing the power and potential of renewable energy to reduce fossil fuel and associated CO2 emissions.

1. Reduction in dependence on foreign sources of critical materials, which is a significant concern for national security and supply chain issues.

2. Production of a material that possesses a competitive specific capacity while avoiding the expansion and stability issues of other high-energy-density anode material.

3. Development of materials that can be sustainably sourced and grown as opposed to being mined, significantly reducing the impact to the environment.

4. Utilization of agricultural waste products providing a circular pathway for up-cycling these materials for high-value applications.

SiOC-RECYCLED GRAPHITE COMPOSITES

TECHNOLOGY OVERVIEW

SiOC-Recycled Graphite composite anode work supported by a U.S. Department of Energy Phase II SBIR Award #DESC002278.

Accomplishments:

- Integrated & tested recycled graphite (RG) with varied impurities, from different recycling processes.
- Reversible capacities of up to 800 mAh/g for SiOC-RG composite anodes in half cells.
- Pre-lithiated single layer pouch cells show stable performance, reaching >700 cycles above 80% relative capacity.
- Demonstrated technology in 260 mAh pouch cells and scaling to >2Ah cells prior to the end of the project.

As of 2022, the U.S. had a 100% net import reliance on natural graphite, which has been deemed a critical mineral.

- Battery grade graphite shortage beginning in 2022 and could increase to 6M by 2040.
- This novel PDC technology provides an opportunity for domestically sourced anode materials with high capacity, high cycle life while being economically and environmentally sustainable.

SIGNIFICANCE OF THE TECHNOLOGY

- This solution is low-cost and easily scalable compared with other alternative processes and utilizes abundant resources such as biomass or recycled graphite from spent lithium-ion batteries or production scrap to create high-value anode materials.
- Would create a circular economy and improve the economics of recycling graphite or utilizing biomass waste materials in a value-added application.

PARTNERS & COLLABORATORS

U.S. DEPARTMENT OF ENERGY, INTERNATIONAL BATTERY SEMINAR AND EXHIBIT, CBIC, GAIN TECH, Q&Q Carbon Ltd. by Aika Metals

About C-BATT

Founded in 2023, C-BATT is a joint venture between X-BATT®, a pioneer in advanced battery materials, and CONSOL Innovations. C-BATT is developing Obsidia™, a solution to solve the ongoing supply chain challenges due to the electrification movement. C-BATT's solution increases battery energy density and cycle life beyond traditional materials. The C-BATT battery lab is in Oviedo, FL, just outside the University of Central Florida. For battery materials development, C-BATT will use CONSOL Innovations' domestically sourced carbon resources.

About X-BATT®

Established in 2019, X-BATT® focuses on leveraging its patented technology for high-capacity, low-cost, scalable lithium-ion battery components and provides customized, cutting-edge solutions that will allow the renewable energy future to be fully realized.

www.x-battinc.com

About CONSOL Innovations

CONSOL Innovations LLC, a wholly-owned subsidiary of CONSOL Energy Inc., is dedicated to creating long-term value through sustainable innovations in the carbon products and materials and carbon management markets. With a mission to “Reimagine Carbon for a Sustainable Future,” CONSOL Innovations is founded on the belief that our abundant carbon resources, which have fueled human progress since the Industrial Revolution, can also serve as an important building block for meeting the critical and evolving needs of society going forward. The company, with primary operations in Triadelphia, WV, is focused on providing disruptive, carbon-based solutions for growing industries including aerospace, building products, and energy storage.

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