



APPLICATIONS FOR BATTERY TECHNOLOGY



BASIC MATERIALS



COMPONENTS



ASSEMBLY



RECYCLING

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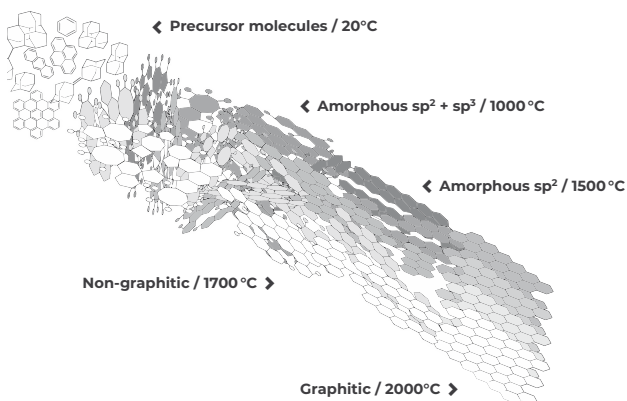
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HEAT TREATMENT

THERMAL PROCESSING OF CARBONACEOUS MATERIAL AT UP TO 3000°C TO PRODUCE HIGH-QUALITY ELECTRODE MATERIAL

Carbonaceous material is converted into uniform, stacked layers by subjecting it to high-temperature processing. The resulting nanostructures are held together by Van der Waals forces, which are weak intermolecular forces that occur between molecules or atoms. The HTK and GLO furnace series are specifically designed to optimize temperature control for the production of consistent and uniform materials. They feature off-gas handling systems to ensure safety and compliance with environmental regulations. The uniformity of the stacked layers enhances the movement of electrons and ions through the material, an essential feature for high-performance applications such as batteries.

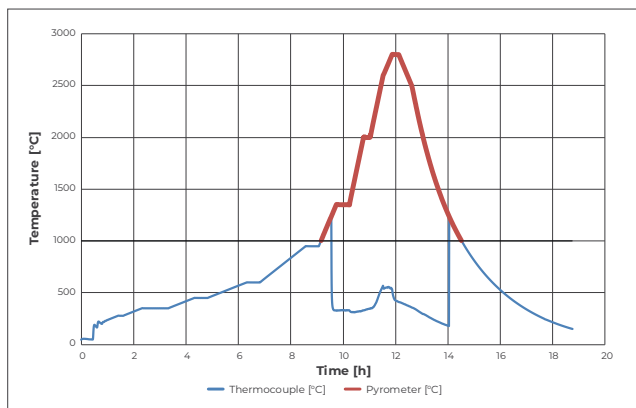


Phase changes in carbon to produce amorphous carbon structures.

HEAT TREATMENT

SYNTHESIS OF ELECTRODES THROUGH PYROLYSIS AND SINTERING OF PRECURSOR MATERIAL

The precursor material consists of elements that allow uniform layering of the battery material. Repeatable uniform heating enables unwanted binders and solvents to be removed leaving the sintered battery material in a stable state. Carbolite have furnace solutions for both gram scale research volumes and pilot plant units with advanced safety PLC systems and gas handling. Stable repeatable heating environments enable production of uniform materials, this is fundamental in the end batteries performance.



Temperature profile with reaction steps and gas flow for optimised pyrolysis and sintering.



CHAMBER FURNACES FOR GRAPHITISATION

SHORT FACTS

- | Developing high quality graphite for electrode material
- | Thermal processing at 3000°C under inert atmosphere
- | Off gas management system, safe, environmentally friendly

FIELD OF USE

- | Research & Quality Control



TUBE FURNACE RANGE

SHORT FACTS

- | Pyrolysis and sintering of electrode material
- | Hot wall furnaces with controlled gas handling system

FIELD OF USE

- | Research & Quality Control



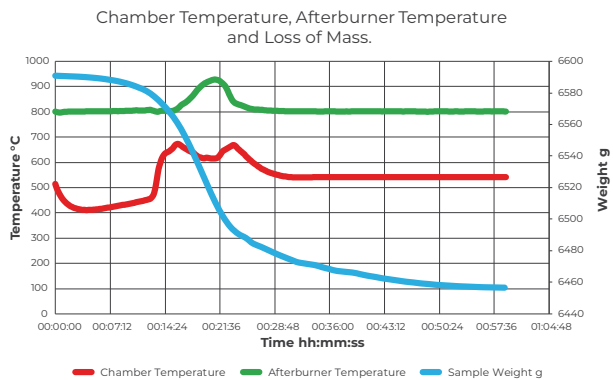
HEAT TREATMENT

THERMAL PROCESSING OF RECYCLED BATTERY MATERIALS TO EXTRACT REUSABLE ELEMENTS

Thermal processing is one process step that can be used in research applications for processing batches of material to recover recyclable elements and precious metals under modified atmosphere and in air. Carbolite batch furnaces can incorporate a balance to measure weight loss over time and against temperature. Off gas handling systems are available to ensure environmental impact is minimized. Under European Directive 2013/56/EU 50% by mass of battery materials need to be recycled.



**ASHING FURNACE
AAF - BAL**



Loss on ignition measurement of material to ascertain mass loss, indicating furnace temperature, thermal oxidizer temperature and mass change of the sample.

- SHORT FACTS**
- | Thermal extraction of desirable materials from recycled battery components
 - | Loss on ignition testing

- FIELD OF USE**
- | Research & Quality Control

