

**PIENAAR ENERGY (PTY) LTD**

# **Carbon felt for all-vanadium redox flow batteries**



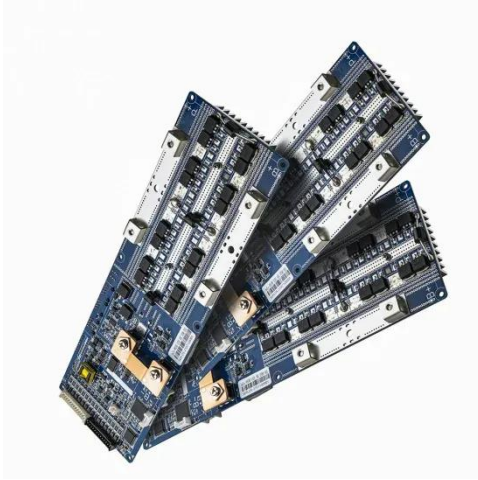
## Overview

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A high-performance carbon felt electrode for all-vanadium redox flow battery (VRFB) systems is prepared via low-temperature atmospheric pressure plasma treatment in air to improve the hydrophilicity and surface area of bare carbon felt of polyacrylonitrile and increase the contact. A high-performance carbon felt electrode for all-vanadium redox flow battery (VRFB) systems is prepared via low-temperature atmospheric pressure plasma treatment in air to improve the hydrophilicity and surface area of bare carbon felt of polyacrylonitrile and increase the contact. All-vanadium redox flow batteries (VRFBs) are one of the future strategic energy storage technologies for large-scale applications.

## Carbon felt for all-vanadium redox flow batteries

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### Investigating the Influence of Treatments on Carbon Felts for Vanadium

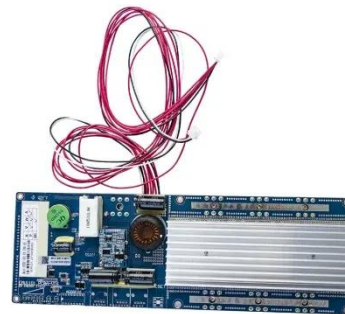
Vanadium redox flow battery (VRFB) electrodes face challenges related to their long-term operation. We investigated different electrode treatments mimicking the aging processes during ...

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### Multi-fractal Nanoporous Carbon Sphere-Decorated Graphite Felt

We report a novel electrode design based on sustainable fructose-derived porous carbon spheres (F-PCS) uniformly deposited on graphite felt (GF) through a simple hydrothermal method, ...



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### Full article: Two-in-one strategy for optimizing chemical and

In this study, a carbon felt (CF) electrode with numerous nanopores and robust oxygen-containing functional groups at its edge sites is designed to improve the electrochemical activity of a ...

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## N, O Co-doped carbon felt for high-performance all-vanadium redox ...

We, for the first time, demonstrate a facile preparation of N, O dual-doped carbon felt (CF) as electrodes in all-vanadium redox flow batteries (VRFB).

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## Performance Enhancement of Vanadium Redox Flow Battery by ...

A high-performance carbon felt electrode for all-vanadium redox flow battery (VRFB) systems is prepared via low-temperature atmospheric pressure plasma treatment in air to improve the ...

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## Performance Enhancement of Vanadium Redox Flow Battery by

The modified carbon felt exhibits higher energy efficiency (EE) and voltage efficiency (VE) in a single cell VRFB test at the constant current density of 160 mA cm<sup>-2</sup>, and also maintains good ...

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## Improvement of Vanadium Redox Flow Battery Efficiency

## Through ...

In this study, we employed atmospheric dielectric barrier discharge (DBD) to modify the commercial carbon felt (CF) electrodes for VRFB efficiency improvement. The treatment conditions ...

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## Carbon felt coated with tungsten-bismuth-based oxides as highly ...

For developing the VRFB negative electrode, tungsten/bismuth-based oxides (W-Bi) were solvothermally synthesized and grown on carbon felt (Wx-Biy@CF) using different initial W/B.

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## Investigating the Influence of Treatments on Carbon ...

Vanadium redox flow battery (VRFB) electrodes face challenges ...

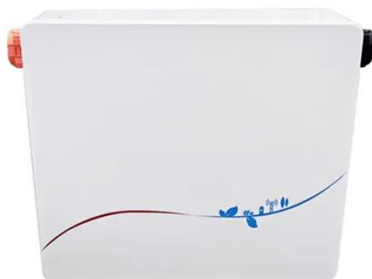
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## Insights into the Modification of Carbonous Felt as an Electrode for

Here, we give a brief review of recent

progress in the modification methods of carbonous felt electrodes, such as surface treatment, the deposition of low-cost metal oxides, the doping of ...

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## Characterization of carbon felts for vanadium redox flow battery

Activated carbon felt electrodes are widely used in the vanadium redox flow batteries. However, the direct correlation between felt properties, redox reaction kinetics, and battery ...

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