Principal Investigator

Chiba University **Takaaki Wajima**

Adopted Theme

Development and Commercialization of Zero-Emission Carbon Fiber Recovery Technology Using Novel Molten Salts

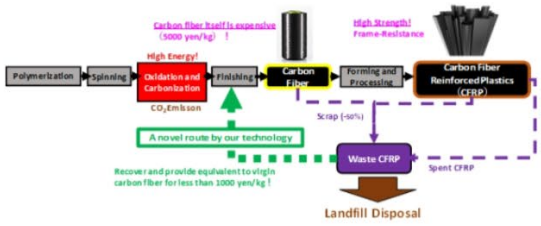
Subject of Research

Development and Commercialization of Zero-Emission Carbon Fiber Recovery Technology Using Novel Molten Salts

GTIE VC Collective

JAFCO Group Co., Ltd.

Overview



Carbon fiber reinforced plastic (CFRP), a material offering both lightness and strength, is experiencing global market growth, whereas waste CFRP is also increasing. There is a strong demand for technological development to recover high-strength carbon fiber from waste CFRP, as carbon fiber is expensive and its manufacturing process carries a significant energy burden. Conventional methods have faced challenges: recovered carbon fibers degrade and exhibit inconsistent properties, limiting their applications; the resin is not reused and is treated as waste gas or liquid, hindering widespread adoption. This technology aims to develop a zero-emission carbon fiber recovery system. It utilizes a prepared molten alkali hydroxide solvent to selectively dissolve only the resin from CFRP. This enables the recovery of high-strength carbon fibers, the gasification and utilization of the dissolved resin, and the repeated use of the solvent.

Business Models (when applying)

We adopt an “on-site supplier” model that processes CFRP waste within customer factories, recovering and reselling long-fiber, high-strength rCF through chemical decomposition using molten salts. By implementing a dual-income model that generates revenue from both waste processing fees and the sale of recycled carbon fiber, we achieve a highly profitable, zero-emission recycling business that minimizes raw material procurement costs and logistics expenses.

Activity Planning (when applying)

This project aims to commercialize carbon fiber recovery technology using molten alkali hydroxide solvents and conduct pilot-scale demonstrations over two years. In the first year, we will identify challenges such as performance, durability, and reaction sustainability through processing aircraft scrap using large-scale equipment. We will also evaluate the quality of recovered carbon fiber, estimate costs, and conduct customer interviews. In the second year, based on the identified issues, we will improve the equipment and processes. We will conduct another demonstration run and perform a detailed cost evaluation. Concurrently, we will advance negotiations to sign a memorandum of understanding (MOU) with one potential customer, secure a CEO candidate and core manufacturing personnel, and establish a commercialization framework.