

CLEAN RESOURCES

ADVANCED HYDROCARBONS

INNOVATIVE HYDROCARBON PRODUCTS – BITUMEN BEYOND COMBUSTION

FUNDING DETAILS

Carbon Fibre from Alberta Oilsands Asphaltene (AOA) – Phase 2

Phase 1 of the Carbon Fibre Grand Challenge (CFGC) enabled Deakin University to demonstrate that precursors derived from Alberta Oilsands Asphaltene (AOA) can be potentially used as a low cost and sustainable substitute for PAN in the production of Carbon fibre.

The objective of Phase 2 of the CFGC is to develop continuous carbon fibre from AOA precursor with the highest performance parameters achievable. This project will enable chemical/thermal modification of the AOA to provide an understanding of how the impurities impact on wet spinning and the potential for melt spinning. This project will also enable optimization of the spinning process parameters as well as high temperature carbonization utilizing the unique continuous fibre research line at Carbon Nexus.



RECIPIENT:
Deakin University



PARTNERS:
None



TOTAL BUDGET:
\$1,064,995



AI FUNDING:
\$500,000



PROJECT DATES:
AUG 2021 –
JAN 2023



PROJECT TRL:
Start: 3
End: 6

APPLICATION

The target markets for carbon fibre manufactured using AI asphaltene as a precursor will be determined by the performance of the fibre that can be achieved during Phase 2. The optimum performance of the fibre will be identified which will enable the highest value target markets to be identified and pursued. It is anticipated that the fibre will have applications in automotive, wind turbines, oil and gas, infrastructure and sporting goods.

ALBERTA INNOVATES CLEAN RESOURCES

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PROJECT GOALS

The key goals of the project are:

- Development of chemical/thermal processes for modification of the AI precursor to remove contaminants and enable optimum spinning of the fibre;
- Achieving improvements in fibre performance via optimization of the spinning and high temperature carbonization process; and
- Validation of carbon fibre optimum performance and identification of potential target applications.

BENEFITS TO ALBERTA

It is recognized globally that the potential market for low-cost high-performance fibre is enormous. In 2020, the global carbon fibre market was valued at \$4.2 billion. By 2030, the carbon fibre market is forecast to exceed \$13 billion. Cost and performance are the key drivers with regards the value proposition for end users and are the underlying objectives of Phase 2.

In addition to a reduction in cost, a successful outcome may also lead to:

- Economic diversification for Alberta;
- A reduction in GHG emissions;
- Creation of unique products and processes that will drive industry and employment.

This project is intended to deliver significant economic as well as environmental outcomes for Alberta.



1 Publication



1 Patent



1 Unique Product /
Process



11-100 Future
Jobs

CURRENT STATUS

AUG 2022

Deakin University has successfully established methods for chemical/thermal modification of AI precursor and validating the modification methods by detailed characterization of AI precursor materials. The modified AI materials is used to develop optimum processing conditions for spinning of carbon fibre precursor. To establish process-structure-property relationship of carbon fibre, developing suitable temperature profiles for stabilization and carbonization of developed precursor fibres is currently underway which will be used to produce continuous carbon fibres using the globally unique Carbon Nexus facility at Deakin University.