MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2022-2023

Project Title: Carbon Fibres from Waste Materials

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Objective

Carbon fibres are stiff, strong and lightweight materials that also have impressive temperature and chemical tolerance. These properties make them attractive for 'high-tech' applications in aerospace, military and competitive sports domains. The penetration of carbon fibres into other markets is, however, hindered by cost, since they are made from polyacrylonitrile (PAN), a high cost precursor. This project aims to develop alternative carbon fibre materials from waste materials (tyre, plastic, biomass) and/or Victorian lignite which are vastly cheaper potential precursors.

Project Details

Precursor materials will be processed in various ways to render them soluble in appropriate 'green' solvent matrices. Carbon fibre matts will be prepared by the electro-spinning method and the structural properties of these materials will be compared by a variety of physico-chemical, microscopic and mechanical methods. The relationship between the synthesis (electro-spinning) conditions and the resultant structural properties will be investigated. The student will develop cross-disciplinary experience by working closely with researchers in the Chemistry, Materials Science and Chemical Engineering disciplines who are collaborating on this project.

Prerequisites

Students with an interest in future materials, recycling of waste materials, clean energy and sustainability are encouraged to apply. Students who are at least in their 3rd undergraduate year and who have cross-disciplinary unit completions in Chemistry, Materials Engineering and Chemical Engineering are preferred.

Additional Information

Applicants may be required to attend an interview.