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BIOPOLYMERS & CHEMICALS

Scion provides New Zealand's leading centre of expertise in bio-based chemicals, polymer and composites research. Our focus is developing functional chemicals, biopolymers and composites from renewable resources, preferably from New Zealand. Applications include plastics, composites, foams, adhesives and coatings.

POLYMERS & COMPOSITES

Our research is focused on manufacturing polymers and composites from renewable resources and developing their applications. Our capabilities include:

- Synthesis (polycondensations, emulsions) of new functional biopolymers such as modified biopolyesters (polylactic acids, polysuccinates), functional additives and cross-linkable bioresins derived from natural polyphenolics, terpenes and other bio-precursors.
- Extrusion compounding and reactive extrusion of biopolymers, bio-additives and complex biomasses, and their applications in plastics and composites.
- Development of high performance long fibre (e.g. wood, harakeke), reinforced plastics and bioplastics.
- Biofoam technologies including extrusion foaming, particle (bead) foaming (PLA and other biopolymers) and other foaming processes (polyurethane, phenolic).
- CO_2 mediated polymerisation, processing and foaming of biopolymers.
- 3-D printers.

PACKAGING SOLUTIONS

This research encompasses sustainable packaging solutions and functional food packaging solutions. Our capabilities include:

- Packaging based on pulp/paperboard, plastics/bioplastics/biofoams and hybrid materials also including biomass and process residues.
- Improved packaging properties such as creep and humidity resistance, odour.
- New barrier coatings and films for improved moisture resistance and barriers.
- Printing technologies and troubleshooting; new inks and new applications of printing.
- Light-weighting of packaging and packaging designs.
- Recycling and end-of-life reuse of packaging.
- Specialty testing of packaging products such as cool store box testing, humidity-creep, biodegradation-compostability, accelerated aging.

CHEMICAL SYNTHESIS & DESIGN

We focus on the extraction, synthesis and design of new chemicals from renewable resources, including new bio-precursors for biopolymers/additives, and on the application of green chemistry to make industrial bio-products. Examples of our capabilities include:

- Extraction processes, fractionation and purification of extractives from wood, bark, other natural resources and process residues.
- Organic syntheses, functional derivatisations and analyses of extractives and other renewable chemicals including natural polyphenolics and terpenes.
- Use of clean solvents, aqueous and CO_2 mediated processes.

ADVANCED CHEMICAL & MATERIALS CHARACTERISATION

Scion has an array of scientific instrumentation available for use in chemical, polymer and materials research. We also provide analytical services. Our capabilities include:

- Spectroscopy suite: Nuclear Magnetic Resonance suite (multinuclear solution and solid state NMR and Proton MR imaging); FT-IR/ATR/FTIR microscopy; NIR; UV-Vis.
- Mass spectrometry suite (GC-with olfactory capability MS; Pyrolysis GC-MS; ICP-MS).
- Chromatography suite (various HPLCs, GCs and IC).
- Materials testing facilities (thermal/mechanical e.g. DSC, TGA, DMTA, rheology).
- Biodegradation-compostability research and testing.
- Materials testing facility (thermal and mechanical).
- CHN analysis; and autotitration.

CONTACT

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