SwRI®
SOUTHWEST RESEARCH INSTITUTE®

Biomass Assay and Product Characterization

The Process Chemistry Laboratories at Southwest Research Institute® (SwRI®) provide analytical support for both renewable energy and petrochemical process research projects. Bench-scale to demonstration-scale projects can be conducted at SwRI, or commercial-scale at client facilities.

New products, feedstock, and processes may produce complex sample matrices that often require development of novel methods to appropriately characterize these materials. To evaluate new technologies, SwRI staff carefully measure the physical and chemical properties and characteristics of biomass feedstock and its products.

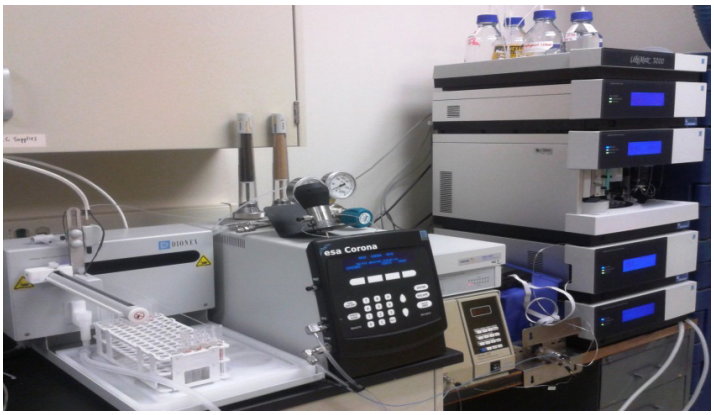
Routine analyses and methodologies may not determine all the necessary characteristics of the sample or process. Following industry trends, SwRI has developed biomass assay capabilities which include animal or vegetable glyceride and fatty acid classification, sugar and cellulose characterization, and lignin breakdown product examinations.

Capabilities

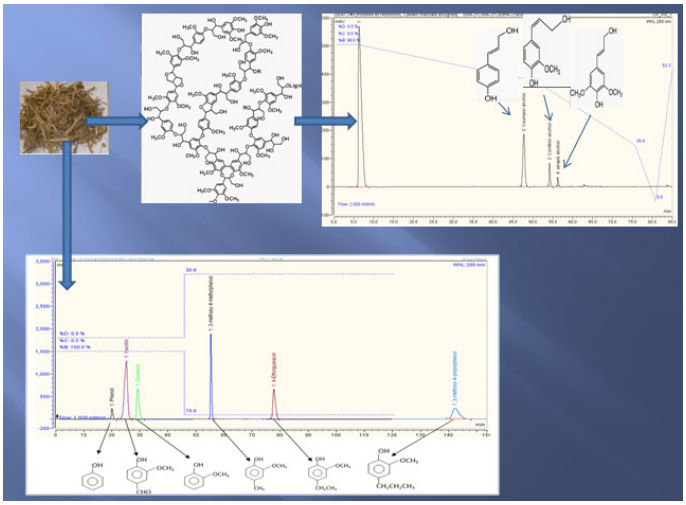
- NREL LAPs and ASTM testing
- Multi-detector GC & GCMS
- Multi-detector HPLC system

Analytical categories

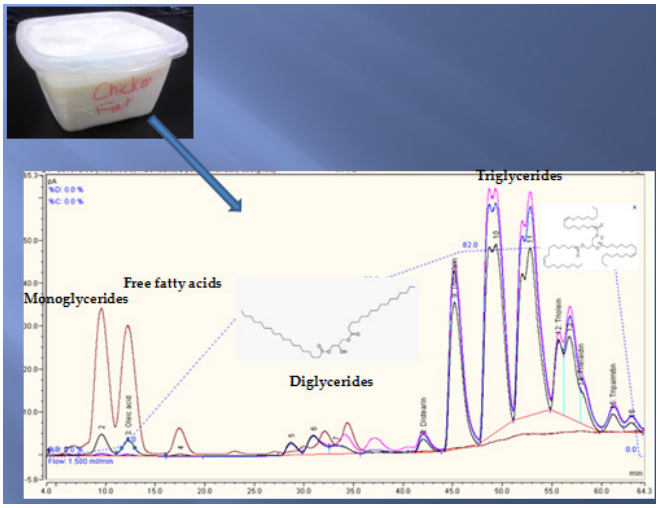
- Organic acids
- Carbohydrates, cellulose, hemicellulose
- Poly-substituted phenols (e.g., in lignin breakdown products)
- Lignol assay: sinapyl alcohol, confieryl alcohol, coumaryl alcohol
- Fatty acid methyl esters, free fatty acids, and mono-, di-, and tri-glycerides
- Ash and moisture content
- Dissolved solids
- Extractives
- Simultaneous anion and cation
- Porphyrins
- Normal and reversed phase HPLC



The HPLC (high-performance liquid chromatography) system is equipped with three detectors: variable wavelength (VW) UV-vis, corona-charged aerosol detector (CAD), and refractive index (RI).



SwRI applies HPLC methods to analyze of lignin breakdown products: lignol assay (sinapyl alcohol, confieryl alcohol, and coumaryl alcohol), and poly-substituted phenolic assay.



SwRI generates HPLC analysis of free fatty acids and mono-, di-, and tri-glyceride content in animal fat.

SwRI scientists conduct microbial field assays.

SwRI set up a gas chromatographic system to support a 24/7 pilot demonstration unit. The specialized system contains heated valve enclosures (top) in which remote-controlled valves deliver a target sample stream to a specific GC instrument.

We welcome your inquiries.

For additional information, please contact:

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Accelerated shelf-life study of bio-derived oil determines product stability (left to right: t=0, t=24, t=44 hours).

characterization tests

fuelsenergydev.swri.org

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