

Analysis of Greenhouse Gas, Soils and Plants

This fact sheet outlines the capabilities, pricing and sample preparation and submission details for analysis of greenhouse gas, soils and plants by QUT's Central Analytical Research Facility (CARF).

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Greenhouse Gas Analysis

Analysis of CO₂, N₂O, and CH₄ is performed simultaneously using an Agilent 7890A Gas Chromatograph instrument. This instrument is fitted with a Flame-Ionisation Detector (FID), Thermal Conductivity Detector (TCD), and an Electron Capture Detector (ECD). Below are our calibration ranges for all three gases. Values are given in ppm.

	N2O	CH4	CO2
STD 0	0.26	2.05	355
STD A	0.52	4.1	710
STD B	1.07	7.96	1615
STD C	2.7	10.66	3124
STD D	5.55	25.97	6804
STD E	10.61	53.35	13060
STD F	25.28	109.3	26060
STD G	50.62	576.5	53580

Pricing

	Turnaround Time	Vial Supplied by QUT	Vial Supplied by client
Technician Driven	4-6 weeks	\$9.00	\$7.50

Sample preparation

Samples are collected and stored in 12ml Soda Glass Vials fitted with a double wadded cap supplied by [Labco Limited](#). Vials are evacuated in-house using an Edwards 1.5 two stage pump and sent to the client. 20mL of sample should be placed into the vials to allow for over-pressurisation and multiple injections to occur. Minimum order is for 100 vials. Any unused vials can be returned to the laboratory without incurring a fee. Evacuated vials can be ordered **through CARF**. Please allow up to two weeks for orders exceeding 500 vials. All vials ordered through our laboratory will come with labels for the client to print sample information and place on the vial. Samples with two or more overlapping labels will be sent back for removal and re-labelling. Vials that do not comply will not fit into the auto-sampler and will not be analysed. The laboratory uses Avery Crystal Clear mailing labels (product number L7551).

Carbon/Nitrogen/Sulfur Analysis (CNS)

Analysis of CNS is performed using a LECO TruMac CNS instrument. This laboratory specialises in analysis of both plant and soil materials. This model of LECO lends itself to a larger sample size and can hence handle heterogeneous materials.

Pricing

Turnaround Time	Technician Driven	User Driven
1-2 weeks	\$11.50	\$9.50

Sample preparation

Dry - Solid samples are to be dried at 50-60°C overnight, or for a few days, until the sample is considered dry.

Grind - Dried samples are to be ground to a powder (particle size <1mm). Samples should be re-dried following grinding as the material may absorb moisture during the grinding process.

Samples are to be placed in individual, clearly labelled, plastic containers. It is recommended that ~5g of sample be submitted to the laboratory.

Stable Isotopes C/N/O/H analysis

Pricing

Turnaround Time	Technician Driven	User Driven
1-2 weeks	\$11.50	\$.9.50

Sample Preparation

Dry- Solid samples are to be dried at 50-60°C overnight, or for a few days, until the sample is considered dry.

Grind- Dried samples are to be ground to a powder (particle size <1mm). Samples should be re-dried following grinding as the material may absorb moisture during the grinding process.

Samples are to be weighed into silver or tin capsules measuring 8mm X 5mm. Sample mass will depend on carbon/nitrogen/oxygen/hydrogen content. Carbon and Nitrogen may be measured first on the LECO TruMac CNS Instrument. Please contact Danielle Bailey prior to weighing samples to discuss sample type and mass needed for analysis.

Sample submission procedures

Please send your samples to the Central Analytical Research Facility at the following address:

Danielle Bailey
CARF Analytical Laboratory
Queensland University of Technology
Level 6, P Block, Gardens Point campus
2 George St, Brisbane QLD 4000

Samples are to be submitted along with the Sample Submission Form. A hard copy of the form is to be included with samples and an electronic copy is to be sent via email to d7.bailey@qut.edu.au
Samples submitted without a form will not be analysed. The form contains information regarding naming samples and good practices. Please read and follow these instructions carefully.

For more information and assistance

Danielle Bailey
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Central Analytical Research Facility
Queensland University of Technology
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www.qut.edu.au/ife/carf