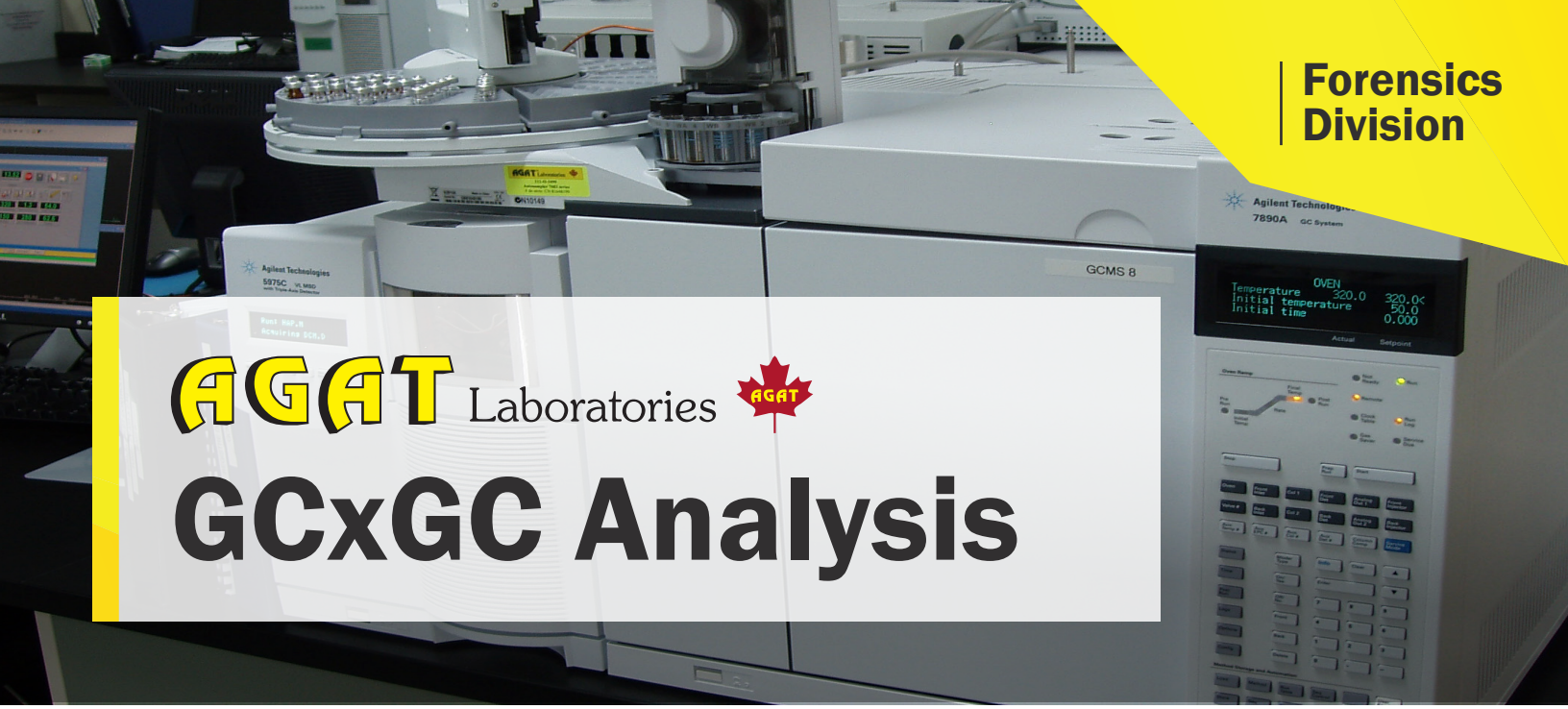


Forensics Division

AGAT Laboratories

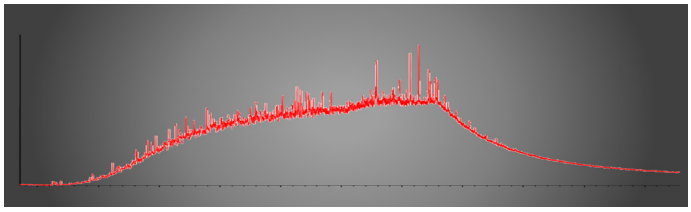
GCxGC Analysis

Overview

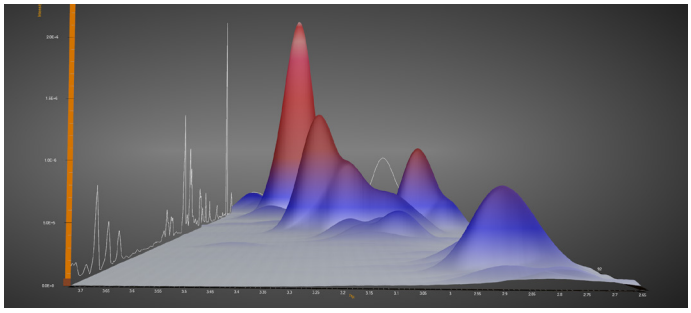
AGAT Laboratories is the first commercial lab in North America to offer GCxGC analysis. GCxGC expands on traditional, single column GC to provide a second dimension to analysis, for a truly comprehensive result. The difference is so profound, it is comparable to the advent of DNA testing in criminal investigations.

GCxGC analysis provides more information about the individual puzzle pieces themselves, as well as showing comprehensively and holistically how the pieces fit together. This enables you to go further than ever before, not only identifying the product type in a release, but potentially narrowing the search to an individual gas station, for example. This means that what was previously ambiguous can now become certain; we're now capable of far more precise identification of compounds, potentially even identifying the geologic formation, and producer, of a given hydrocarbon.

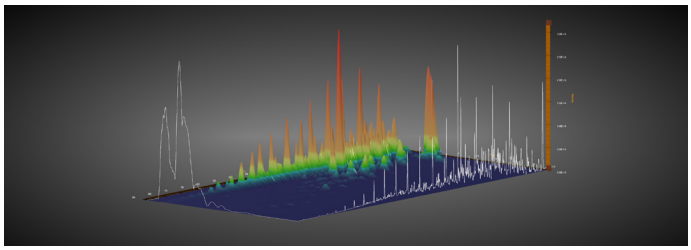
The power of GCxGC can be seen by comparing chromatograms below, from a typical single column separation, and from our GCxGC analysis:



Single column separation with an unresolvable 'hump' or UCM.



GCxGC analysis: Biogenic plant sterol compounds—typically not easily identified by single column GC, are resolved with a second dimension of separation using GCxGC.



GCxGC: Clear group separation creating a unique hydrocarbon 'fingerprint'.

GCxGC Lab Services

Advanced Risk Assessment

Conventional GC methods are unable to adequately separate complex petroleum and petroleum metabolites—which may be just as toxic; meaning recalcitrant, ecotoxic compounds may be hidden. Separation of these using GCxGC enables true site specific, petroleum-related risk assessments; which supports evaluation of cumulative risk and enables effective remediation planning.

Release Aging

Petroleum mixtures undergo weathering on release to the environment, generating countless breakdown products or metabolites unresolvable by routine GC methods. Using GCxGC we can resolve these metabolites enabling advanced degradation and weathering analysis of petroleum re-lated releases.

Spill Characterization

Comprehensive GCxGC fingerprint analysis can enable unambiguous source determination. By generating a unique product profile, you can confidently identify the source, in some cases down to the specific refinery, geologi-cal formation, or gas station. In fact, even evaluation of multiple, variable, and unknown constituent releases is possible. In addition, with GCxGC data at your disposal, you can better estimate physicochemical properties, characterize environmental persistence, uncover degradative processes, and monitor environmental fate and toxicity of a release over time.

Accelerated Site Closures

Biogenic interference can confound even the most skilled analyst, and cause delayed site closures—or even lead to unnecessary ecologically and economically costly reclamation. Using GCxGC we can provide multiple lines of evidence characterizing biogenic and petrogenic contributions to support a definitive assessment, ensuring you can provide an ecologically relevant site assessment that protects sensitive site receptors.

Custom Analytical Packages

AGAT Laboratories is continuously working to add analytical packages in line with your needs and will work directly alongside you to deliver tailor made analytical packages. If a desired analysis is not available directly through AGAT, we will reach out to our vast network of carefully selected partners to support your programs needs.

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