AGAT Laboratories

Ultra-Trace Toxicology

AGAT Laboratories offers Ultra-trace analysis of Persistent Organic Pollutants (POPs) such as Dioxin and Furans, PCBs and PAHs via High Resolution Gas Chromatography/High Resolution Mass Spectrometry. These compounds can be extracted and analyzed in varying matrices, including solids, soil, water, air and biological tissue. Our Ultra-trace Toxicology and specialty analysis operations are accredited by CALA, the SCC and the MDDEP.

Ultra-trace analysis uses the exact masses for the detection of various compounds including; Dioxins, Furans, low-level PCBs, PAHs and other organic compounds. Many of these pollutants are harmful to the environment because they don't diminish naturally. As a result they are a threat to all living organisms causing several kinds of fatal illness in humans, contaminating food sources and diminishing the health of the environment.

Our Analytical Services

AGAT Laboratories offers analysis of Ultra-trace pollutants, achieving incredibly low detection limits. We are able to provide high resolution analytical results when testing for Dioxins, Furans, PCBs and PAHs in varied environmental matrices including:

- Soil/Sediment
- Tissue/Biological
- Ground/Surface Water
- Drinking Water
- Air

Regulations in Canada

Since the early 1980s, the Government of Canada has been working to control and eliminate the releases of various pollutants through regulations for various industries. Some of these regulations include regular testing of samples to ensure that a product is safe for consumers, especially in the food industry.

Pollutants

Dioxins and Furans: Are a group of compounds (called congeners), that share similar chemical and physical properties. They are the by-products of various chemical processes such as:

- Smelting
- Polyvinylchloride (PVC) production
- Bleaching processes for pulp and paper
- Industrial burning and medical incinerators
- Anywhere Cyclic Organics contact Cl and heat

PCBs: Bind to particular matter in the atmosphere and get deposited over great distances. Planar and co-planar PCBs lay flat and thus are extremely persistent. They are formed through several more processes than Dioxins and Furans.

Some of these include:

- Transformer oils
- Almost all incineration processes
- Dye manufacturing
- Forest fires
- Leaching from municipal waste
- Plastic / Rubber production

PAHs: Are a group of compounds that contain two or more benzene rings fused together in different confirmations. There are over 100 of these compounds; however 17 are more toxic than the rest. They are formed from various sources including:

- Incomplete combustion of wood products
- Combustion of fossil fuels
- Industrial processes involving incineration
- Forest fires (largest natural producer)

AGAT Laboratories' Ultra-trace laboratories test for the following:

Soil:

- Dioxins, Furans, PCBs and PAHs
- Detection Limit = 1.0 ng/Kg (D/F and PCB), 10 ng/Kg PAH

Water/Effluent/Aqueous:

- Dioxins, Furans, PCBs and PAHs
- Detection Limit = 1 – 2 pg/L (D/F and PCB), 25pg/L PAH

Tissue/Biological:

- Dioxins, Furans and PCBs
- Detection Limit = 1.0 ng/Kg (ppt)

Our Instrumentation

AGAT Laboratories employs the **High Resolution Mass Spectrometer (HRMS)** for Ultra-trace testing. We process samples in a turn-around time of 15 days. Depending on the number of samples, we also have the resources to take on rush-orders in which the turn-around time is 5 to 7 days. With the HRMS, data results are uncompromisingly accurate to levels at or above detection limits. This results from using exact masses for detection compounds. We use a total of four exact masses to positively identify a compound.

Detection Limits: Our instrumentation coupled with our clean-up processes allows us to reach impressively low detection limits.

- Soil/Sediment/Tissue – 1.0ng/Kg (ppt)
- Water/Effluent/Aqueous – 1.0 – 2.0 pg/L (ppq)

Accreditation

Our company participated in the International Inter-calibration Study and placed in the top 20 per cent of laboratories world-wide based on our results. We are currently accredited to analyze PCB congeners and low level PAHs. We observe local and international protocols and are CALA accredited in Alberta and SCC as well as MDDEP accredited in Quebec.

Life Sciences

The Ultra-trace Toxicology and Food Testing Divisions also includes services geared toward the Life Science Sector. Services include LC-MS/MS technology and some additional GCMS instrumentation. This technology is designed to test for the following parameters:

- Drugs of abuse in wastewater for wastewater-based epidemiology
- Perchlorates in environmental samples
- Nonylphenol Ethoxylates and Pharmaceuticals in environmental samples
- Additional vitamins and sugars in food samples
- Comprehensive Pesticide Residue Screening in food samples
- Antibiotics in food, blood and urine samples
- Mycotoxins and melamine in food samples and containers
- Per- and polyfluoroalkyl substances (PFAS) in environmental samples and tissue
- Acrylamide in environmental samples