SMITHERS VISCIENT

# Environmental Fate Testing

Environmental Fate and Metabolism staff at Smithers Viscient includes internationally recognised experts in environmental fate, biodegradation, bioconcentration, and plant and animal metabolism. With dedicated laboratories, sophisticated equipment, and a staff familiar with global guidelines, Smithers Viscient has extensive experience in the environmental challenges associated with product development.

## Environmental Fate and Biodegradation Studies offered include:

- Biodegradation
- Soil/sludge Toxicity
- Bioconcentration
- Bioaccumulation
- Plant and Animal Metabolism
- Aqueous Hydrolysis
- Aqueous and Soil Photolysis
- Adsorption-Desorption
- Aerobic and Anaerobic Soil/Sediment Metabolism
- Surface water mineralisation
- Aerobic Soil Rate of Degradation
- Using Radiolabeled or Non-Radiolabeled Test Substances
- Column Leaching and Aged Soil Column Leaching
- Terrestrial Field Dissipation Studies

## Equipment and Instrumentation includes:

- Walk-in Environmental Chambers, TOC Analyser, Suntest Photolysis Chambers, Laminar flow hoods, Autoclaves
- Flow-through solid and liquid radiometric, 96-well MicroBeta Scintillation Counter, and PhosphorImager Detectors
- SCIEX API5600 QTRAP, API5000 and API6500+, TripleToF API5600/5600+ and Thermo Q-Exactive instruments for Metabolite Characterisation and Identification
- Agilent, Shimadzu, Waters (U)HPLC systems
- *in-silico* metabolite ID/data interrogation packages including Thermo Compound Discover 2.0, ACD/Labs SpectrusDB including MetaSense and SCIEX MetabolitePilot
- State-of-the-art data collection system LAURA 4 and 5

## Environmental Fate and Biodegradation Studies:

Environmental fate and biodegradation studies provide information on the fate and persistence of a chemical or mixture of chemicals in the environment. Smithers Viscient conducts the full range of standardised biodegradation tests, including ready, inherent, and ultimate biodegradation in complex matrices including activated sludge from sewage treatment plants (STP), water, sediment and soil.

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We offer comprehensive environmental fate testing services to quantify and identify test substances in water, soil, sediment and other complex matrices.

## Bioconcentration and Fish Metabolism Studies:

Bioconcentration studies measure the bioaccumulation of test materials in fish tissue through determination of the bioconcentration factor (BCF). BCF is a comparison of the chemical absorption levels in fish tissue to levels of the test material in surrounding water. We offer a variety of cold and warm water testing species. Test phases are in-life and analysis of residues. Smithers Viscient measures the residues of parent and metabolites using a variety of analytical techniques, including HPLC-UV, HPLC-MS and HPLC with radiochemical detection. Studies provide information of the rate of uptake, time to steady state, total residues bioaccumulated, and information on the metabolic pathway.

Fish metabolism studies are conducted by analysing and identifying residues in fish tissues.

We work with sponsors to design and plan every detail of a study to best meet the product development and/or regulatory compliance needs. Our scientists will typically serve as study directors.

Analytical phases of metabolism studies are performed in our laboratories by expert and experienced staff. Total radioactive residue, extractions, matrix clean up, isolations, and characterisation/radioprofiles of the incurred residue are tailored and performed to satisfy routine and most challenging projects with exceptional care and quality.

In addition, our scientists have experience with specialised studies which involve genetically modified crops and expertise in conducting *in vitro* studies using plant cell cultures and small-scale laboratory *in vivo* investigations utilising specialised techniques including stem injection or vacuum infiltration.

## Regulatory Experience:

- Smithers Viscient has extensive experience in conducting studies meeting regulatory requirements for approval by EPA-FIFRA, FDA-CVM, OECD, JMAFF, PMRA, EMEA, IBAMA and other global regulatory agencies.

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