
ACCURACY OF METHAMPHETAMINE ANALYSIS BY LIQUID CHROMATOGRAPHY–MASS SPECTROMETRY / MASS SPECTROMETRY (LC-MS/MS)

TECHNICAL NOTE

Background

When properties are sampled for Methamphetamine and related compounds (amphetamine, ephedrine, and pseudoephedrine), the accuracy of the results sometimes comes into question by the property owner, tenants or Insurance companies. This is likely to occur when an expensive clean up job, a loss of residence or prosecution is pending.

This technical note is to assist sampling companies, by providing information about the accuracy of laboratory analysis results.

Sampling Properties

It is generally accepted that samplers who are testing properties for methamphetamine residues, follow the internationally recognised NIOSH 9111 method. The principle of this testing is that samples are collected by wiping a 100 cm² area of a hard surface using a methanol (or similar solvent) infused wipe, which is then analysed by a laboratory for methamphetamine and related compounds (amphetamine, ephedrine, and pseudoephedrine).

Reporting of Results

Laboratories do not know if the above method has been followed in all cases, therefore results are published as micrograms per sample rather than micrograms per 100 cm². The sampler will interpret results based on their sampling methodology.

Accuracy

Following the Analysis Request form (Chain of Custody) received with the samples as well as the information on each sample tube, each sample is booked into our Laboratory Information Management System (LIMS), checked, and tracked to ensure the sample results align with each sample site for a given property. We follow a three step process for checking, where three individuals will look over a set of samples and their paperwork before they are approved to go into the lab for testing. This ensures sample identification on samples and the Chain of Custody is accurate before testing the samples and reporting the data to the client.

Each sample is taken through an extraction process and then analysed for methamphetamine and related compounds (amphetamine, ephedrine, and pseudoephedrine) by Liquid Chromatography tandem mass spectrometry (LC-MS/MS).

LC-MS/MS is a highly accurate analytical process and when analysing chemicals such as methamphetamine and precursors, it is specifically looking for those compounds and measuring at levels as low as 20 parts per billion (20 Nano grams)

As an indication of how small 1 part per billion or 1 nanogram is, here are some analogies that may help.

A Nano gram is:

1 car in a line of cars that goes around the earth 100 times.

3 seconds in a century.

A 10 cent coin compared with 100 million dollars.

The equipment used by laboratories is very sensitive, detecting levels 20 times smaller than the above analogies.

There are no known interferences as the LC-MS/MS technique uniquely fingerprints the molecular structure and is regarded as a “Gold Standard” analytical technique that will stand up to any technical or legal challenge.

Any other field screening testing technology must be validated against the LC-MS/MS reference testing procedure.

Summary

Analytica analyse samples provided to us by samplers.

Using the NIOSH 9111 methodology we follow quality control procedures, which ensure that we are specifically targeting and measuring methamphetamine and precursors.

Our methods are not affected by interference from other compounds, and we are fully confident that if other compounds were present in the property being sampled that this would not influence the levels of methamphetamine that we report.

Our procedures are IANZ accredited and are regularly audited.