

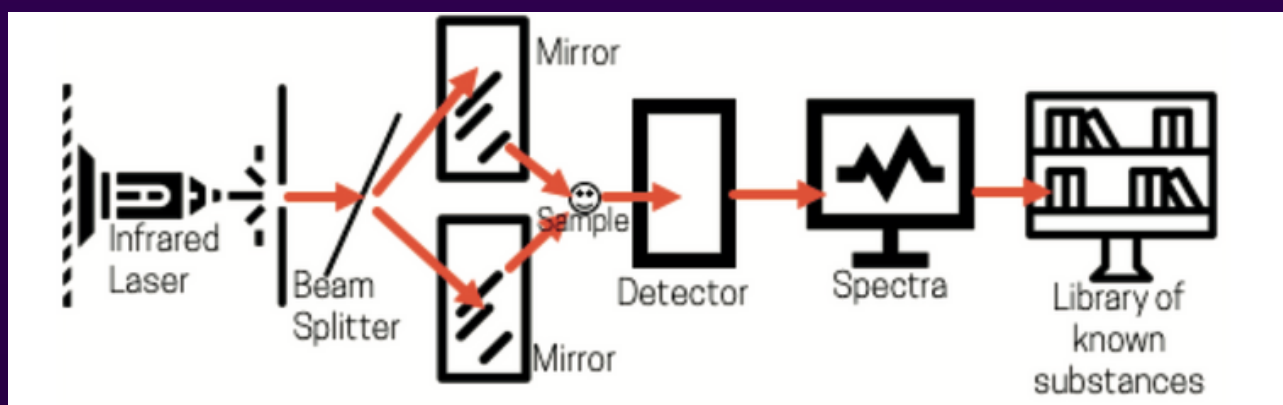
# Drug Checking Technologies

## FTIR

### Fourier-Transformed Infrared Spectroscopy

This technology measures how much infrared light is absorbed by a substance. The different chemical characteristics of a substance affect how it absorbs and reflects light.

When the light hits the substance, some of the light is absorbed, while the rest is reflected. A detector in the FTIR is able to measure a samples' absorbance or reflectance, producing a spectrum (graph) that technicians can interpret.



## Benefits of FTIR

- ✓ Portable
- ✓ Able to detect many components
- ✓ Able to provide rough estimates of quantification
- ✓ Great at detecting bulk cutting agents (sugars)
- ✓ Doesn't destroy sample
- ✓ Relatively fast
- ✓ No/minimal sample prep needed
- ✓ Relatively inexpensive (for a spectrometer)
- ✓ Commonly used for drug checking across the world

## Limitations of FTIR

- ✗ Analysis is manually done by a technician, mixtures can be challenging to interpret
- ✗ Hard to distinguish when similar components are present (analogues)
- ✗ Detection threshold of 5% (can't detect something that makes up less than approx. 5% of a sample)
- ✗ Not able to test plant matter or blotters

## PSMS

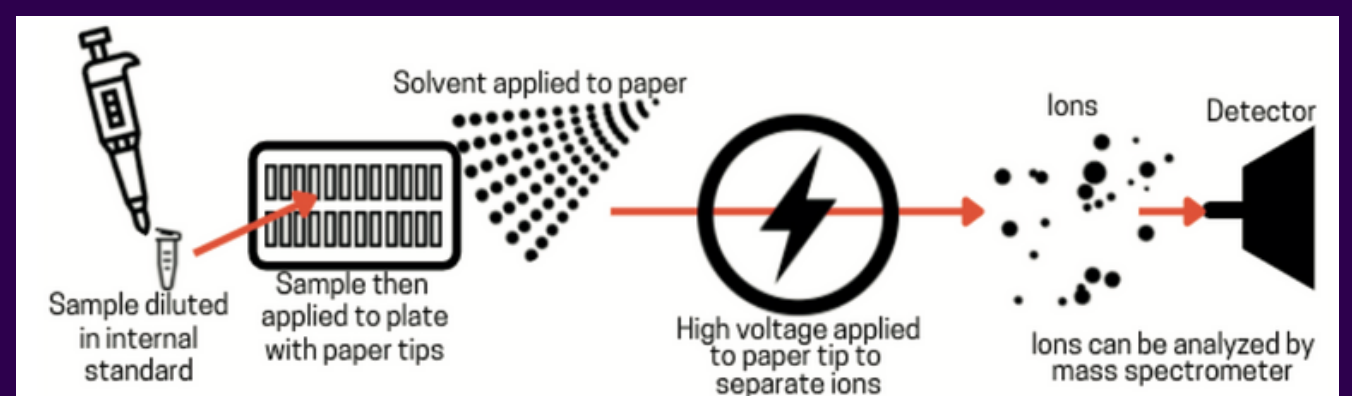
### Paper-Spray Mass Spectrometry

This technology utilizes a very small, precisely weighed amount of substance. The sample is dissolved in methanol, diluted, and applied to a specialized piece of paper. By applying a high voltage to this paper, the sample is "sprayed" into an internal part of the machine, while holding onto an electric charge.



The substance then travels through a series of magnetic fields that separate and fragment the individual components within the sample based on their unique masses (weights) and electric charges.

Finally, the components reach the PSMS's highly sensitive detector which is able to accurately identify and quantify the components in the sample based on three criteria: (1) how and when they've separated and fragmented, (2) their mass, and (3) their electric charge.



## Benefits of PS-MS

- ✓ Able to detect trace-level of components in a sample (~0.01%)
- ✓ Especially useful for detecting low concentration, highly potent actives (ex. carfentanil)
- ✓ Able to provide precise quantitative information (% concentrations)
- ✓ Results are more objective (do not rely on manual interpretation by the technician)
- ✓ "Gold-standard" for chemical analysis, used for confirmatory testing

## Limitations of PS-MS

- Requires precise sample preparation
- Requires extensive training to operate
- Does not automatically screen for things not on our target list
- Cannot quantify things not on our target list
- Range of quantification differs between compounds
- Cannot differentiate between isomers (ortho vs para) or salt vs base forms
- Sensitive to temperature/environmental changes
- Not portable
- Very expensive
- Sample is destroyed in the process



1802 Cook Street Victoria, BC  
Monday - Saturday  
12PM - 7PM

Call/ text: 250-415-7637

Website: [substance.uvic.ca](http://substance.uvic.ca)

Instagram: @drugcheckingvi

# Summary of FTIR vs. PSMS

	<u>FTIR</u>	<u>PSMS</u>
Identify thousands of components		
Detect sugars		
Determine salt versus base forms of a drug		
Detect components that make up less than approx. 5% of a sample		
Trace detection of target substances (~0.01%)		
Provide precise quantification for sample components on a targeted list		
Quantify things not on the target list	N/A	
Differentiate between isomers (eg. ortho VS. para)		
Provide percentage estimates		N/A
Easily identify components in complex mixtures		
Tell service users if something is safe to use		
Provide information about purity		