
Runabout
mercury
analyzer
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Picoyune Runabout

The Picoyune Runabout is a novel mercury analyzer for liquid, solid, and vapor samples.

It is the first field portable tool that is capable of battery powered direct thermal analysis.

Picoyune's proprietary plasmonic mercury detector is more stable, lower power, and offers a wider dynamic range than the alternative methods.

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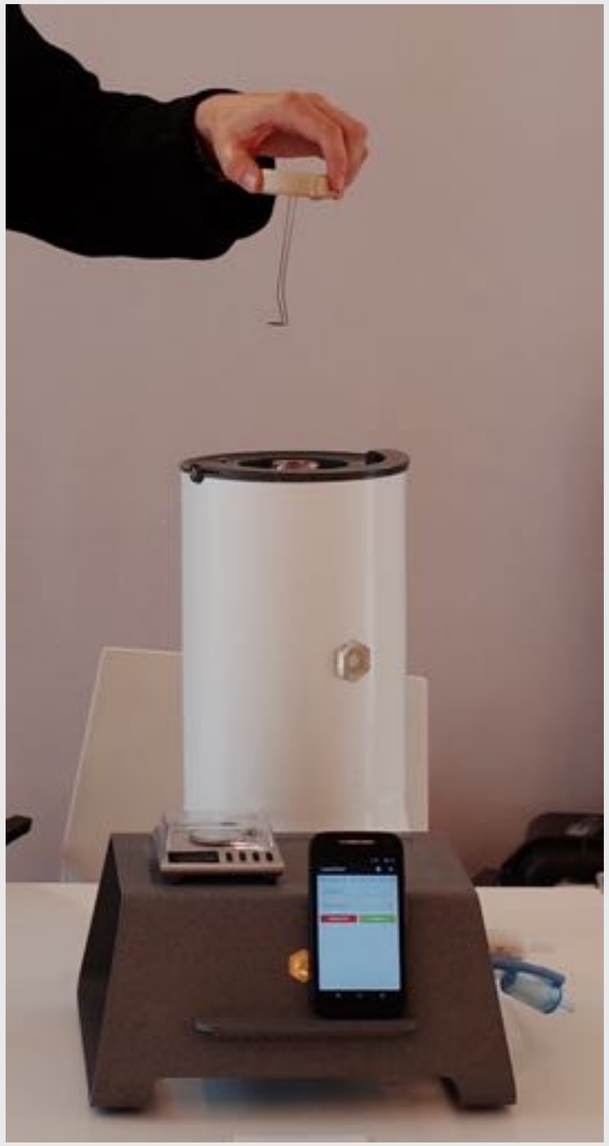
Thermal decomposition

Samples contain a variety of mercury species. Conversion of total mercury to elemental is necessary for transport and detection in the vapor phase.

At high temperatures, mercury is only stable in its elemental form.

The Runabout's furnace heats samples (>650°C) and transmits the mercury from a sample to the detector.

This process is simple, requiring no preprocessing or waste.



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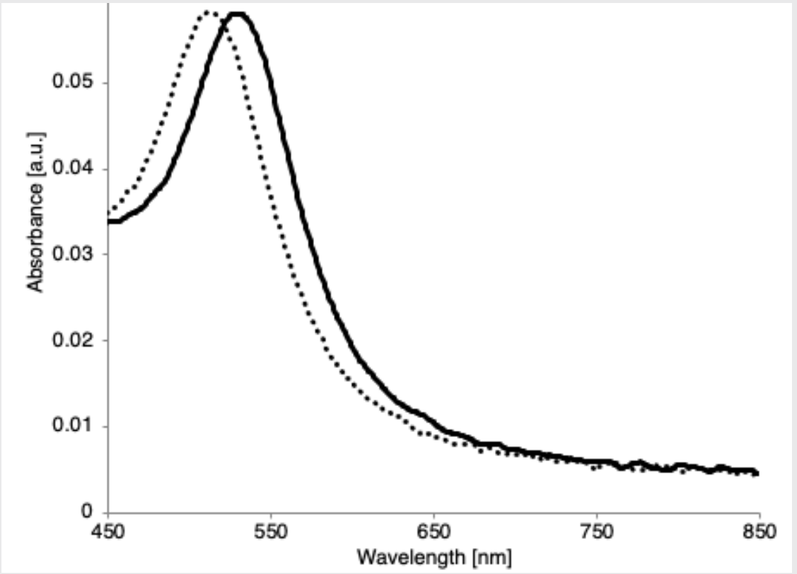
Plasmonic mercury sensing

Plasmonic mercury sensing is an elegant and powerful new method.

Noble metal nanoparticles exhibit a peak absorbance in visible light due to the collective oscillation of the conduction band electrons. This phenomenon is refered to al localized surface plasmon resonance.

Collecting mercury onto gold nanoparticles shifts the resonant peak because mercury has a different signature plasmonic resonance.

By monitoring the visible light transmission, the Picoyune Runabout measures picogram masses of



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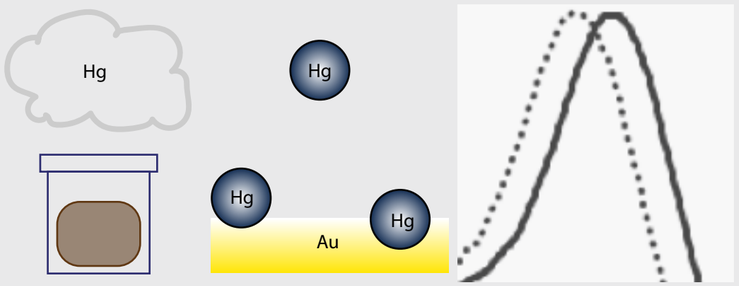
Selectivity

The Runabout is uniquely selective to mercury. There are three key factors contributing to the strength.

1. The unique volatility of mercury vapor.

2. The selective adsorption of mercury by inert gold surfaces.

3. The powerful plasmonic signature of mercury in nanoparticle form.



Portability

Light weight

- Furnace (2 kg)
- Detector (2 kg)

Packs into custom Pelican cases

No carrier gas

Battery powered

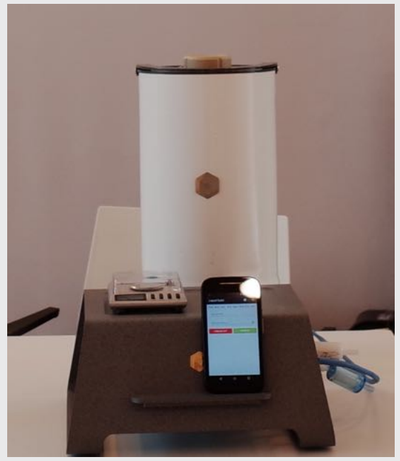
- Detector-12 hours/charge
- Furnace - 5 hours/battery

Specifications

Analytical range:	0.05 to 50,000 ng
Sample interval:	<5 minutes
Sample capacity:	1.5 ml
User interface:	Android OS

The detector functions separately as a vapor monitor.

Vapor range:	0.1-10,000µg/m^3



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XRF Comparison

Feature	XRF	Runabout
Limit of Detection		X
Wet samples		X
Selectivity		X
Representative samples		X
Portability	X	
Vapor monitoring		X
Other analytes	X	
Price		X

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