

GC.IRD

Application Note: Forensics 3

Using the Titan XL PTV Inlet to
Find and Identify the Minor Peaks

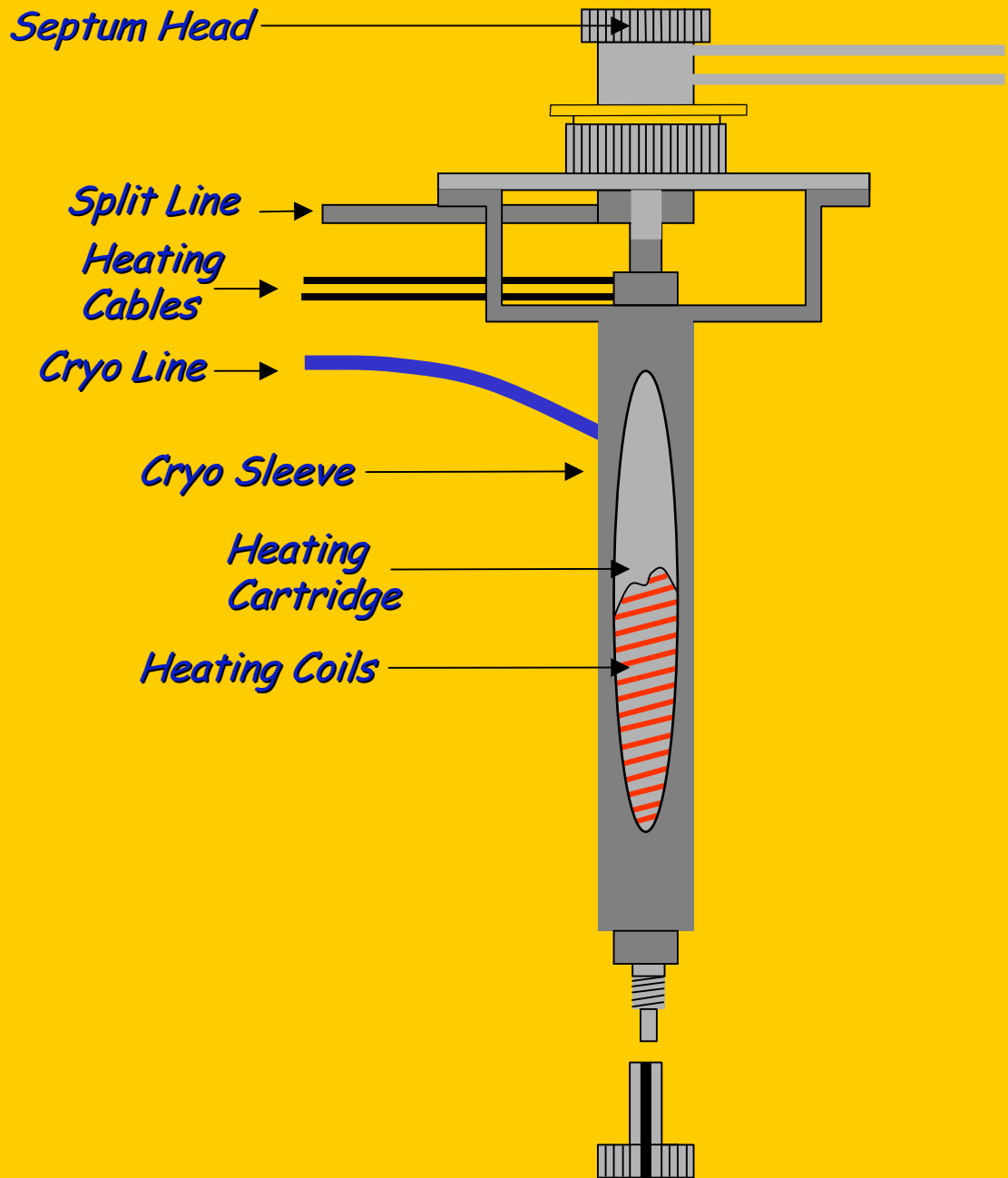


Use arrow keys to navigate through presentation.

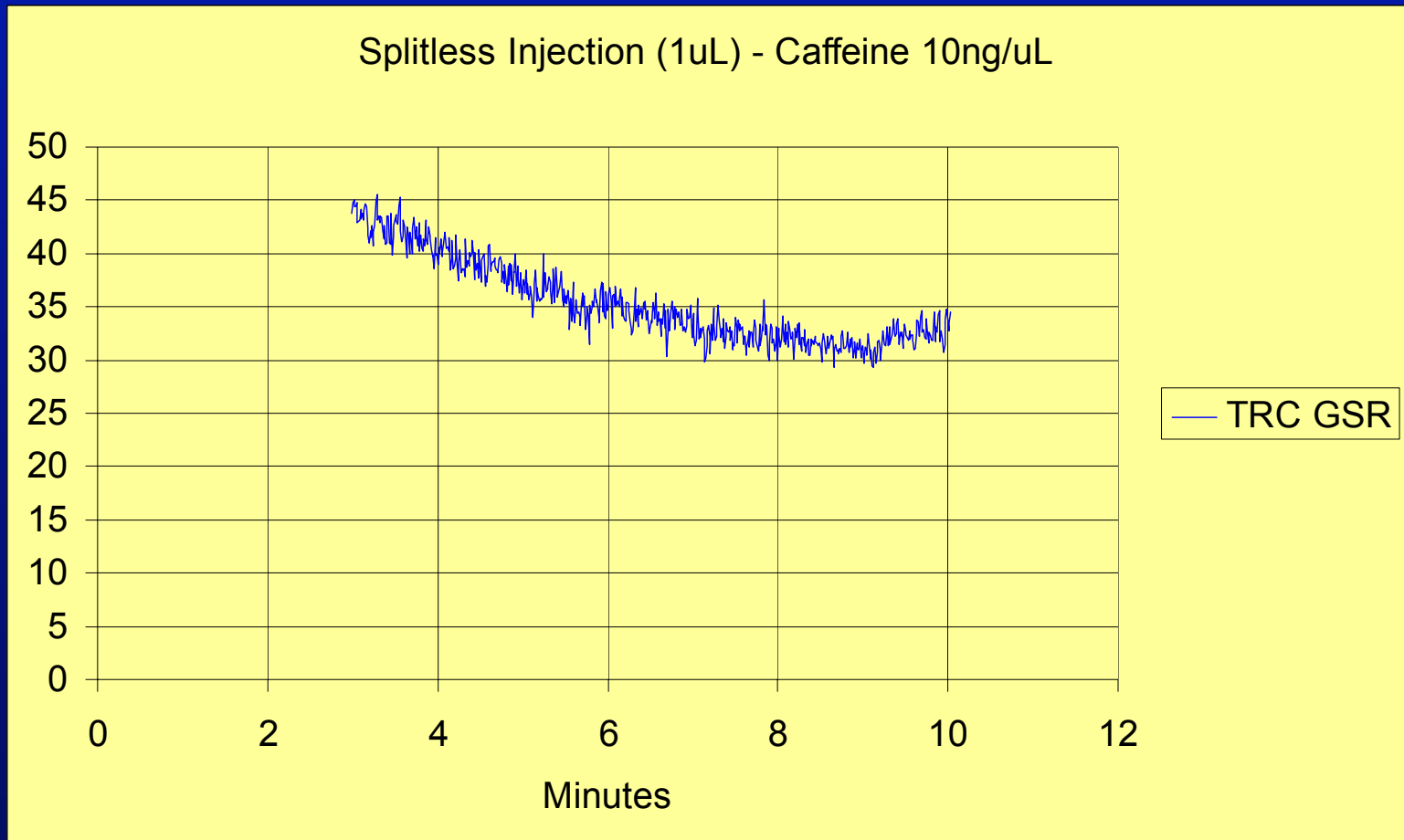
What is a PTV Inlet?

- "PTV" stands for "Programmable Temperature Vaporization"
- Time-Temperature Programmable
 - Cryogenics to cool rapidly
 - Heats up to 700°C/min
- Pressure Programmable
- Principal use - Large Volume Injection

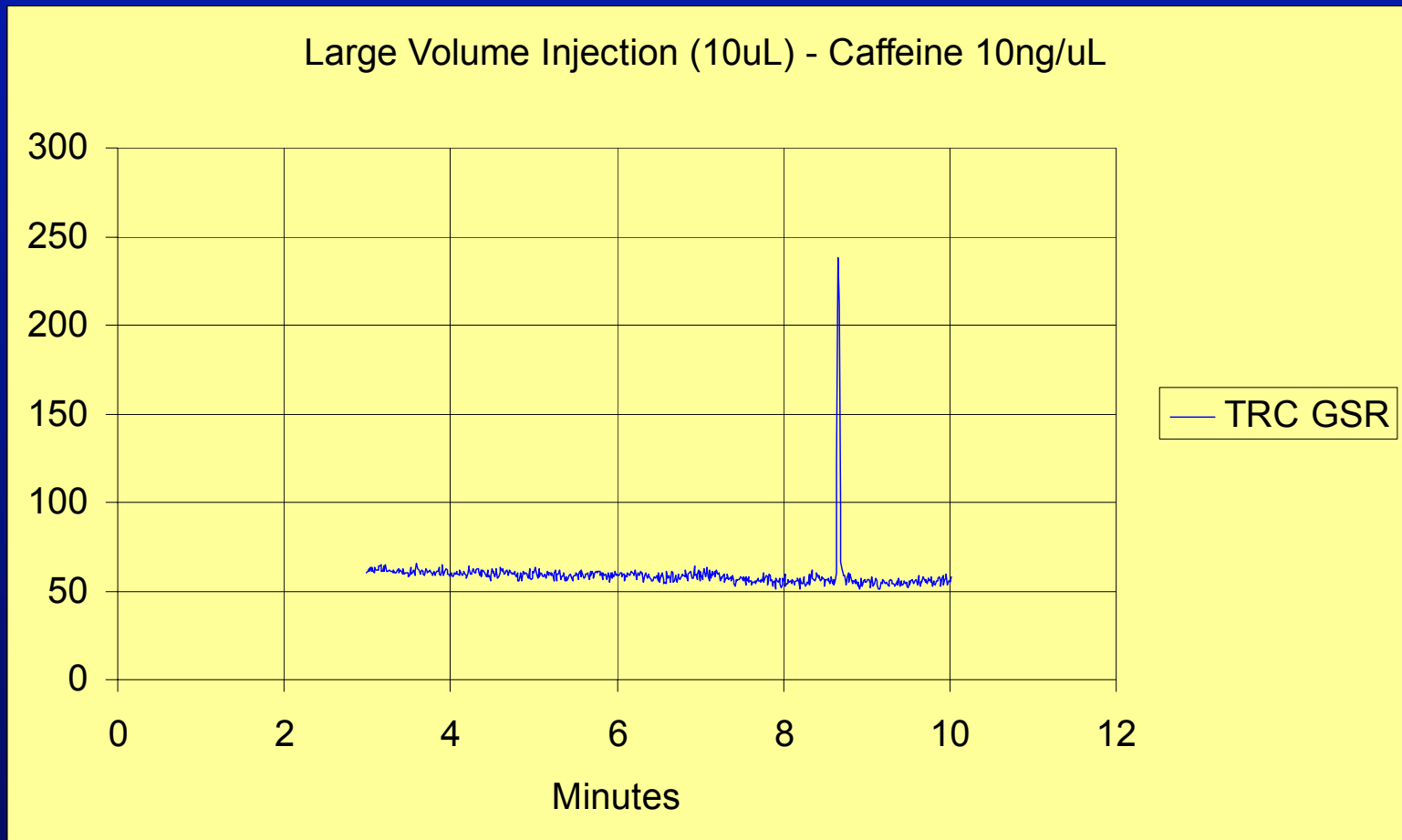
ASAP TitanXL PTV Inlet for Agilent 6890 GC



Standard Injection - Caffeine Not Detected



LVI Brings the Peak Out



How does LVI work?

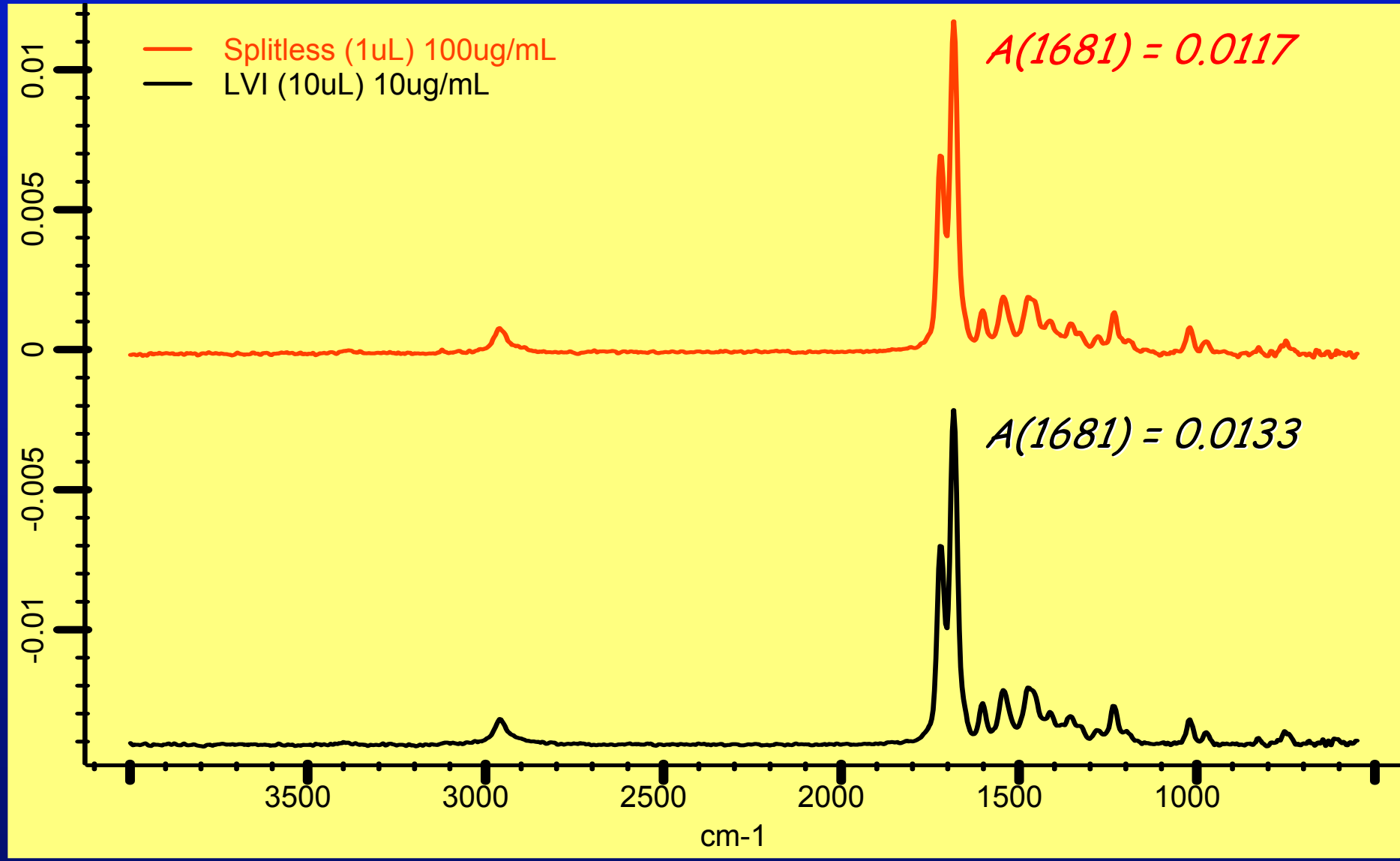
- Initial Injection:
 - Inlet cool based on solvent/analyte.
 - Column head pressure ~ 0 psig - no flow.
 - Flow established to Split Vent.
 - Large amount of Sample injected
 - 10-100 μ L at slow plunger speed.
 - Solvent evaporates with flow.
 - Analytes left in liner.

Analyte to Column

- Split Vent Closes.
- Column Flow established.
- Inlet rapidly heated.
- Concentrated Analyte vaporizes.
- Solvent loading on GC column low.

Does all my sample get onto the column?

- Evaluate the Spectral absorbance.
- Theoretically, a 1 μ L Splitless Injection of 100ng/ μ L sample should give the same response as 10 μ L Large Volume Injection of a 10ng/ μ L sample.
- Check out the 1681cm⁻¹ absorbance...

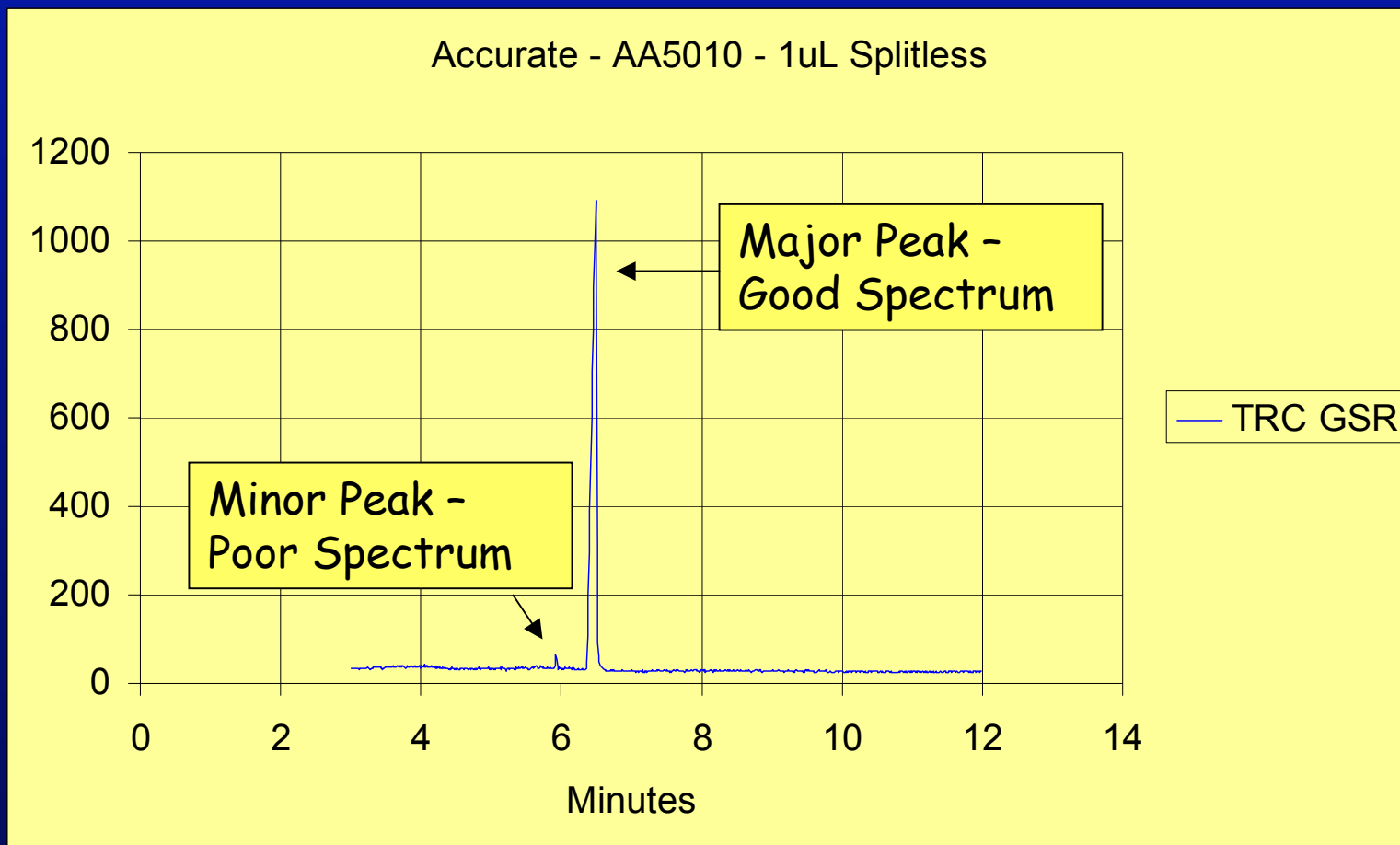


Spectral response equivalent.

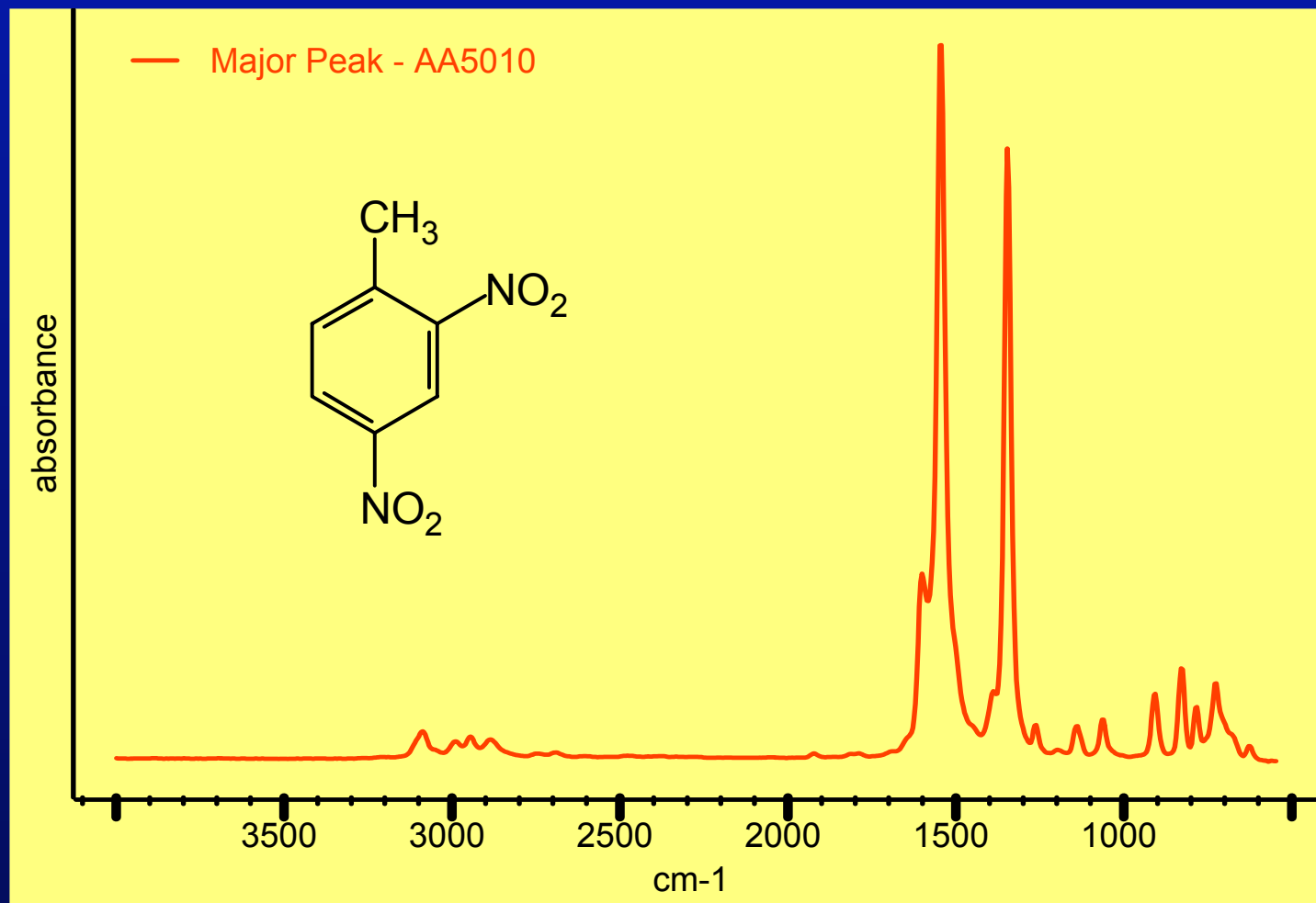
LVI of Smokeless Powder Extracts

- Sample Preparation
 - Weigh 100-150mg of Smokeless Powder
 - Extract into 1.5mL methanol
 - Filter through cotton plug in Pasteur pipette
 - Analyze filtrate by GC.IRD or GC.MSD

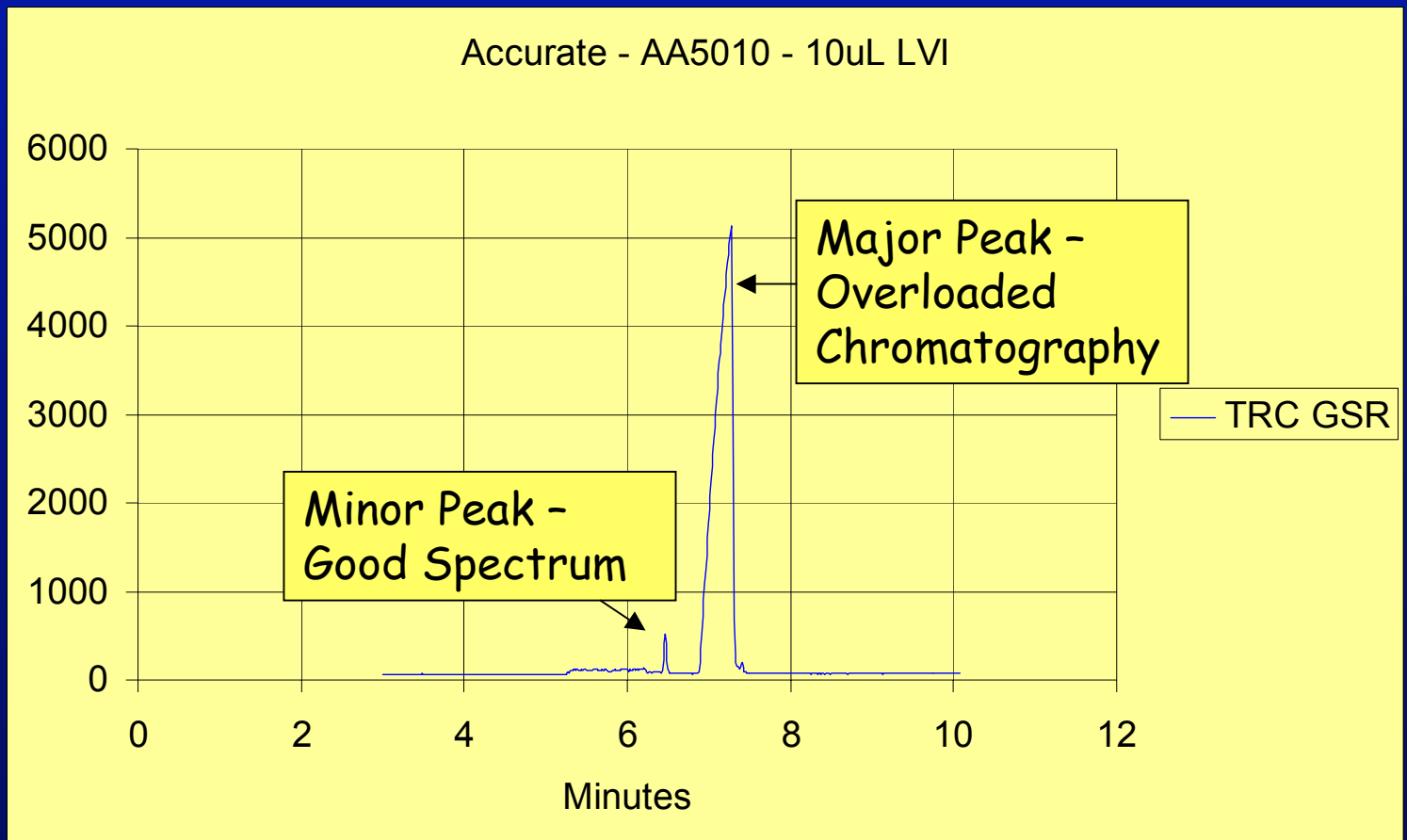
IR Chromatogram - 1 μ L Splitless of Methanol extract - Accurate AA 5010



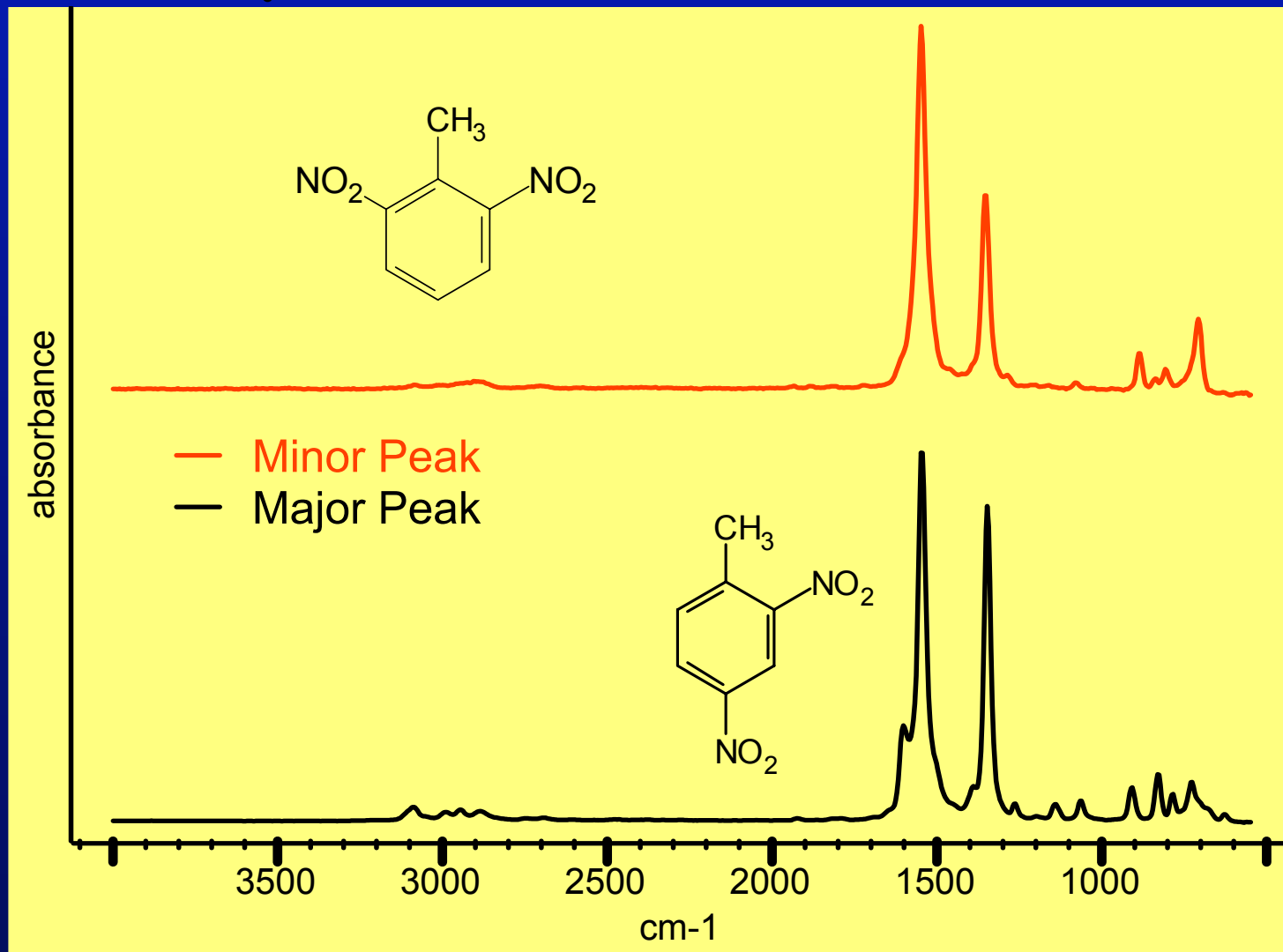
Splitless Spectral Results



IR Chromatogram - 10 μ L LVI of Methanol extract - Accurate AA 5010

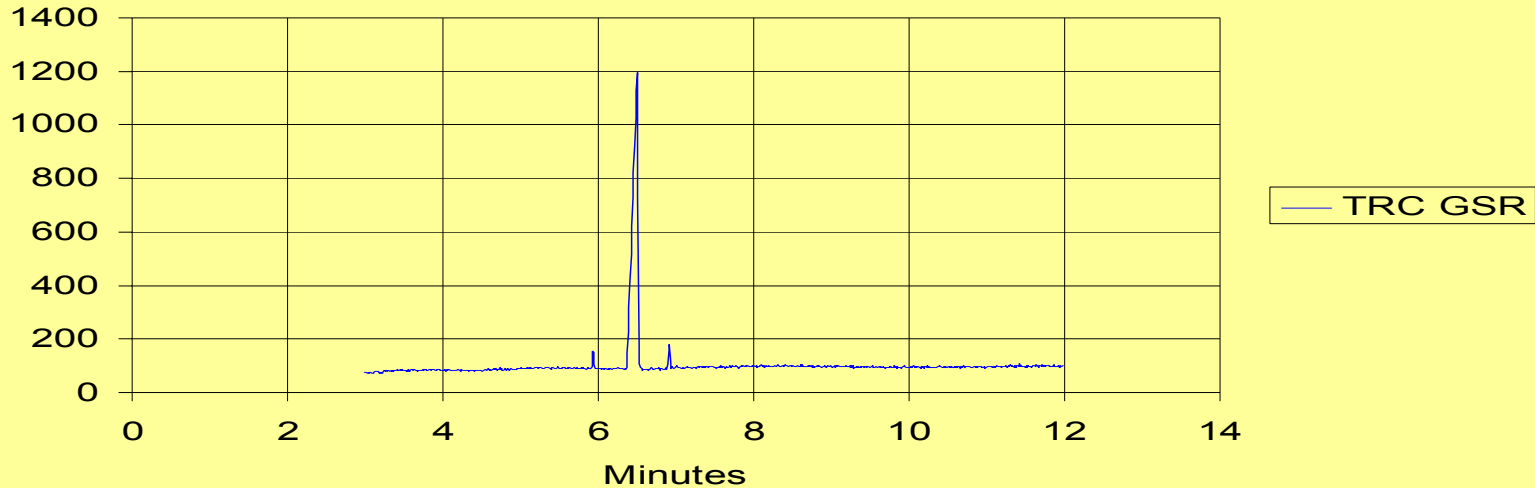


LVI Spectral Results

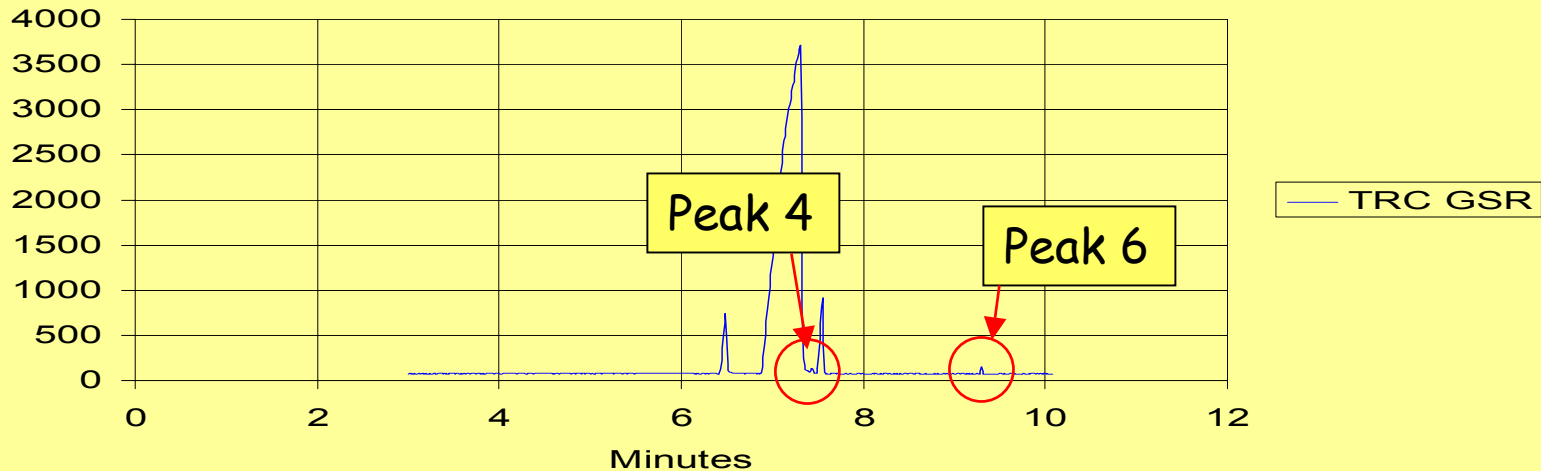


Hodgdon H4350 #3

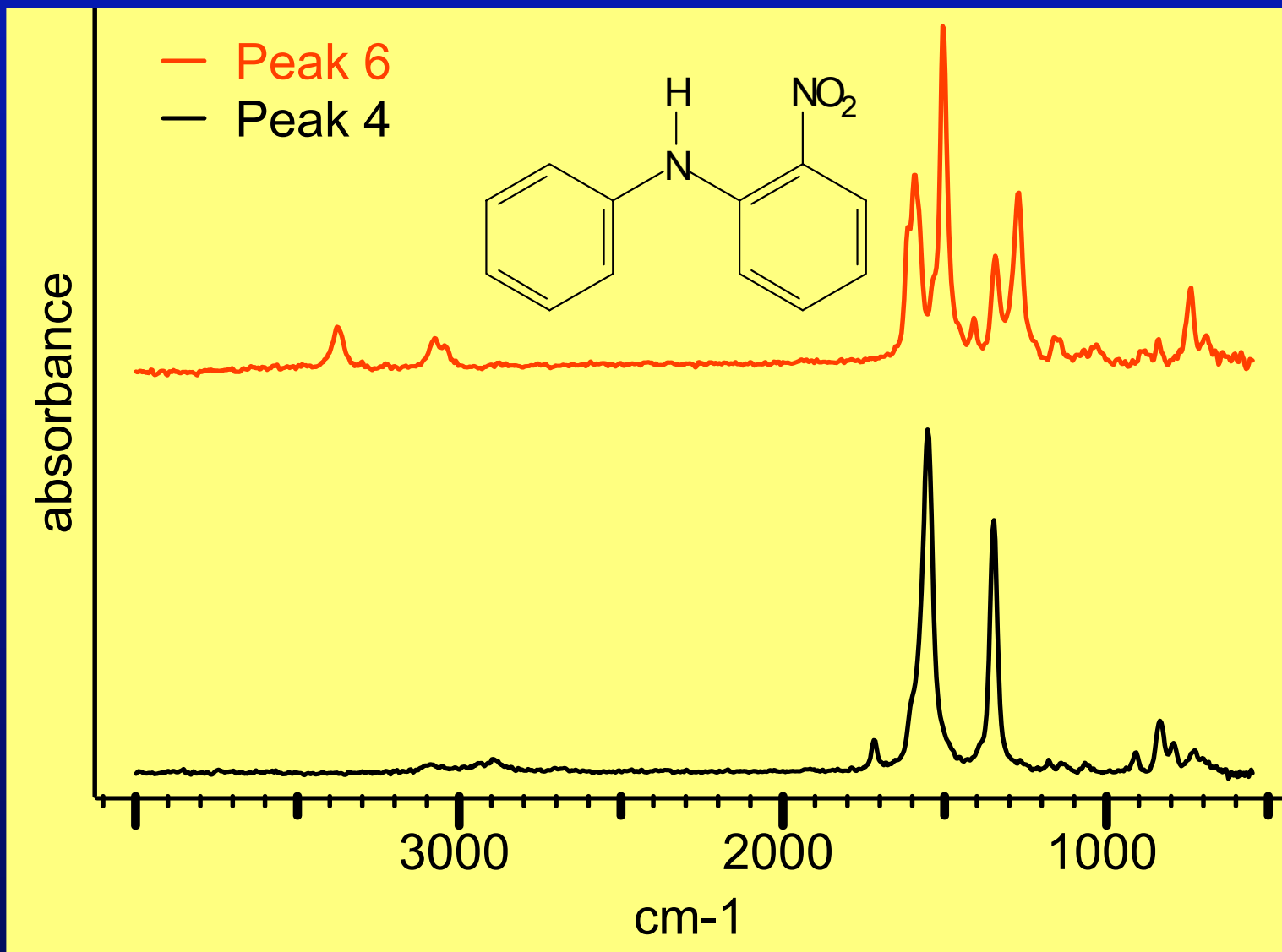
Hodgdon H4350 #3 - 1uL Splitless



Hodgdon H4350 #3 - 10uL LVI



Spectra observed by LVI





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