

Mtx 1HT SimDist

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Project Objective

- Develop a 100% PDMS polymer with the following characteristics:
 - - Thermally stable
 - - Low Bleed
 - - Symmetrical hydrocarbon peaks
 - - Boiling point elution of hydrocarbons

Polymer Characteristics

- Thermally stable to 450c
- Requires minimal conditioning
- Longevity (>350 temperature cycles)
- 100 % cross-linked
- Polarity equivalent to existing liquid phases

Column Characteristics

- Reproducible retention times
- Boiling point elution of hydrocarbons
- Meets resolution criteria of C 50 & C 52
- Meet skewing criteria for polywax 1000 after 10 cycles/day for three weeks.
- No breakage problem

Tubing Characteristics

- ID free of any petroleum based residue during tubing manufacture.
- ID surface roughness <50 RMS units

Sulfinert Deactivation

- The next generation of metal passivation.
- Non-polar surface, therefore no selectivity effects toward aromatics.
- Durable deactivation layer will not fracture.
- Deactivation layer is incorporated into the framework of atoms on the surface of the stainless steel.
- Thermally stable at 450 c.

Column installation and Conditioning

- Connect the column to the injector and detector using graphite ferrules.
- Turn on the carrier gas pressure.
- If using He adjust pressure to 1.0 psig
- If using H₂ adjust pressure to 2.0 psig
- Check the system for leaks using an electronic leak detector.
- If system is leak free ramp the column through one program cycle.

Analytical System

- Equipped with cool on-column injection
- Instrument capable of linear temperature programming from ambient to 430c.
- Detector range to 430c
- Integration system capable of converting the detector signal into peak area slices.
- Accurate recording of retention times.

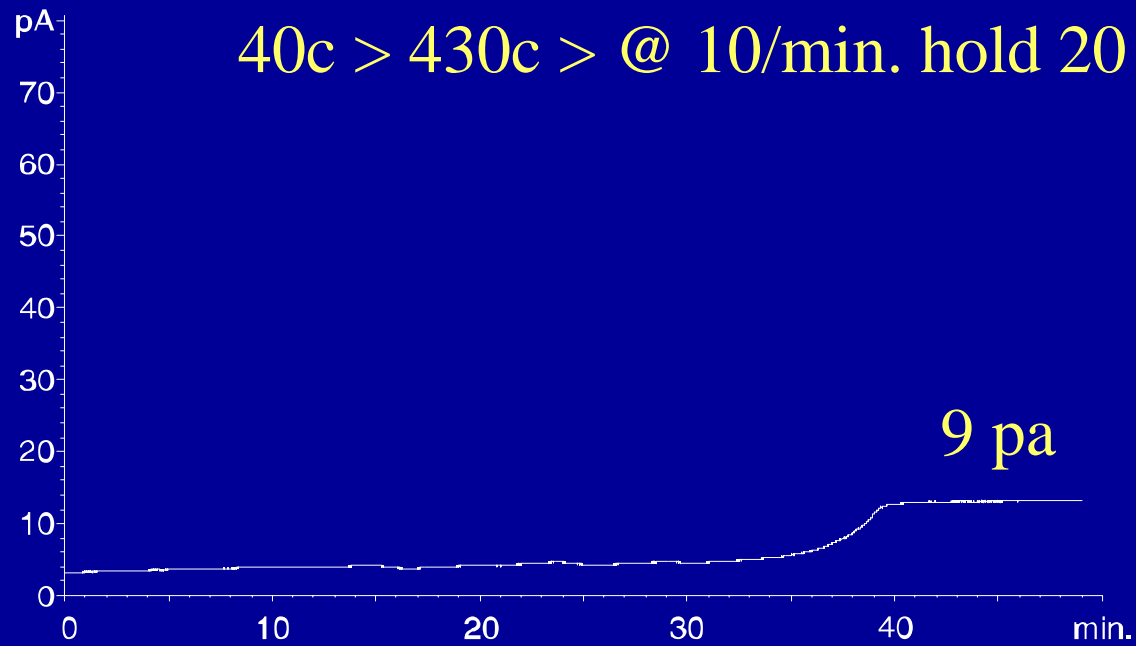
Carrier Gas Considerations

- Gas of choice must be O₂ free to prevent oxidation at high temperatures
- Recommend the use of O₂/ moisture scrubber regardless of the purity of carrier gas being used.
- Use He or H₂ for optimum efficiency

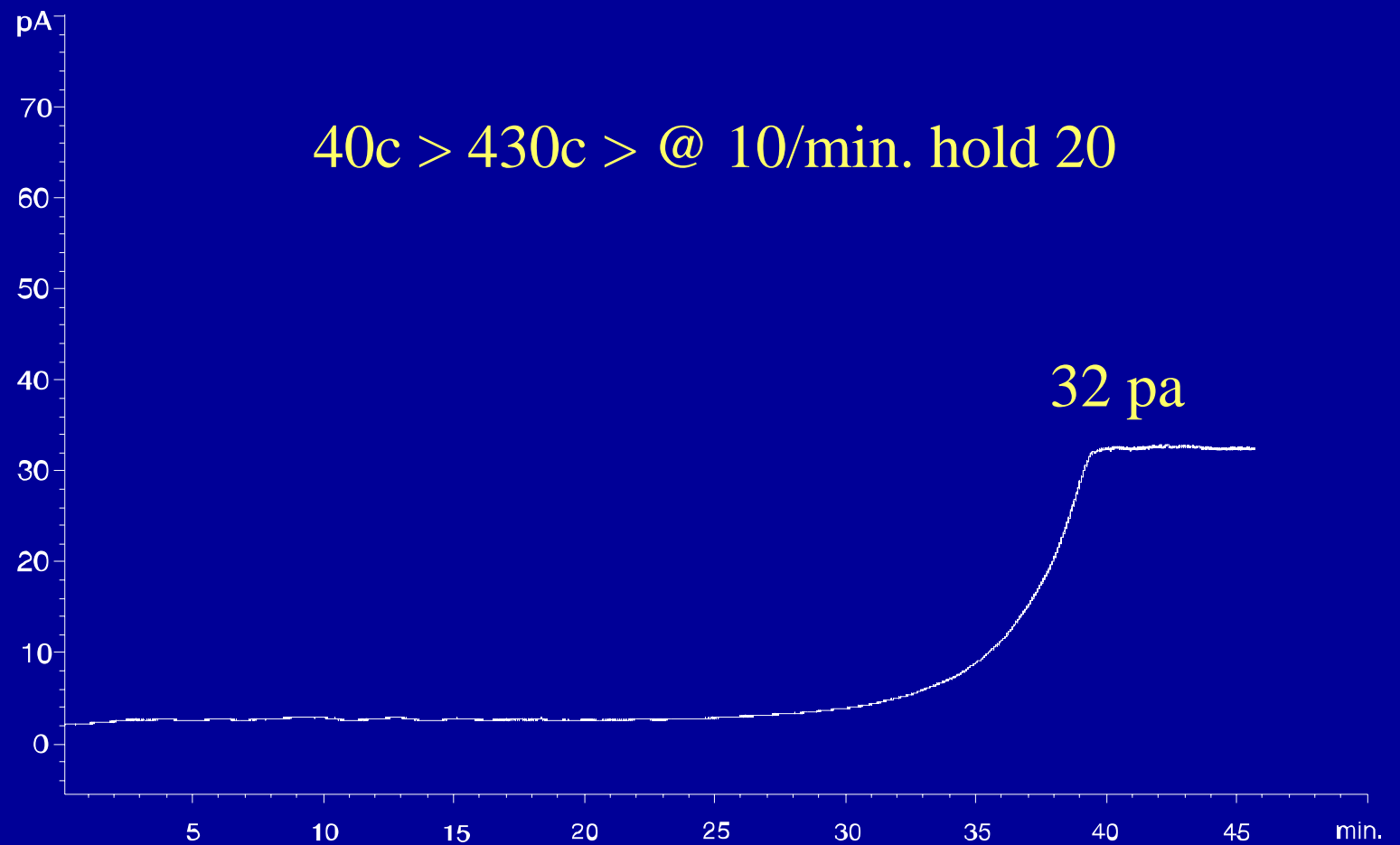
GC Parameters Polywax 1000

- Oven temperature: programmed 40c > 430c @ 10c/minute hold 10 minutes
- Carrier gas: He
- Inlet pressure: 1.0 psig
- Detector temp: 430c
- Injector temp: Cold on column. Oven track mode

MXT-1HT Bleed Profile

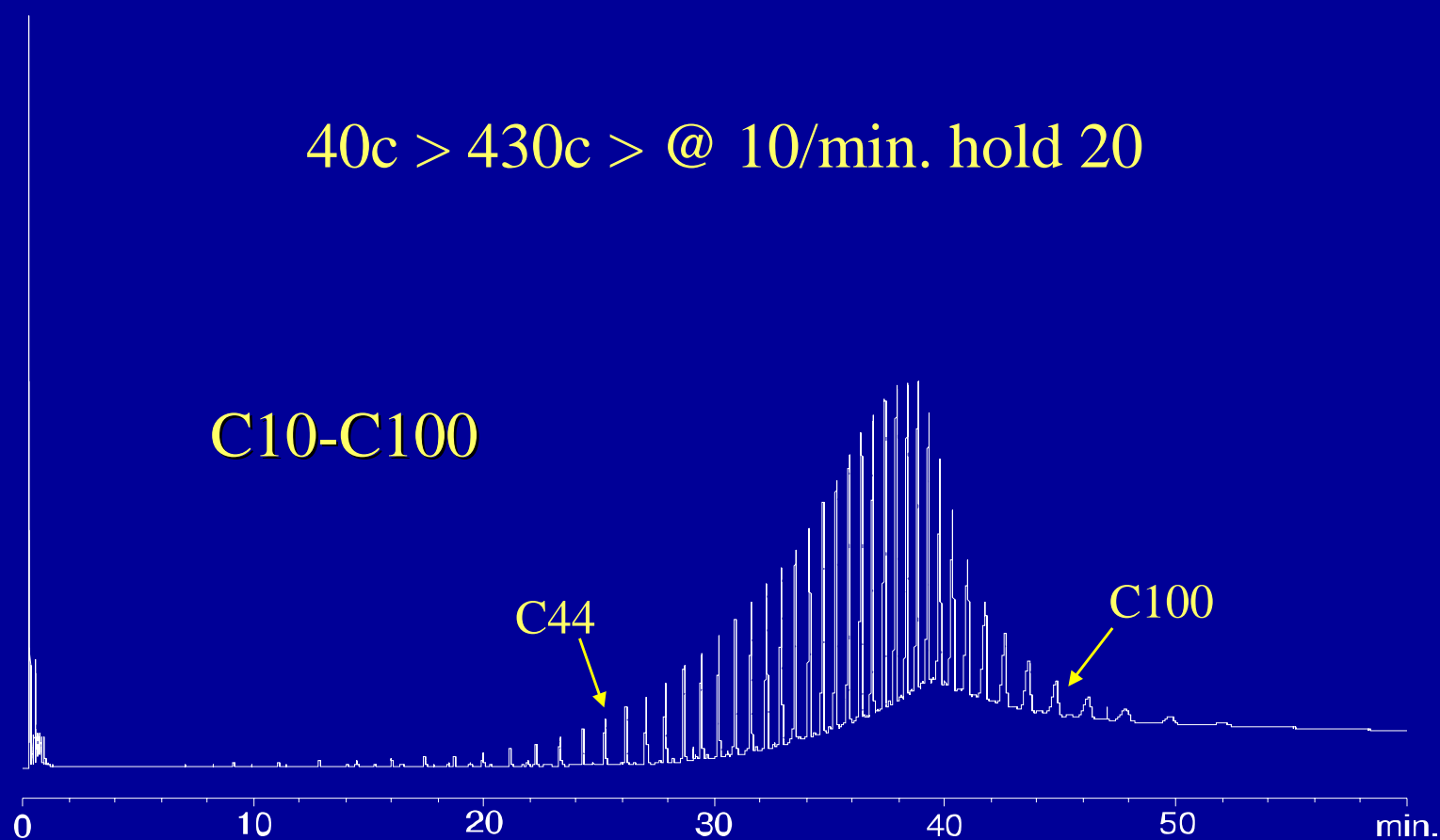


Competitor Bleed Profile



MXT-1HT Polywax 1000 C₁₀-C₁₀₀

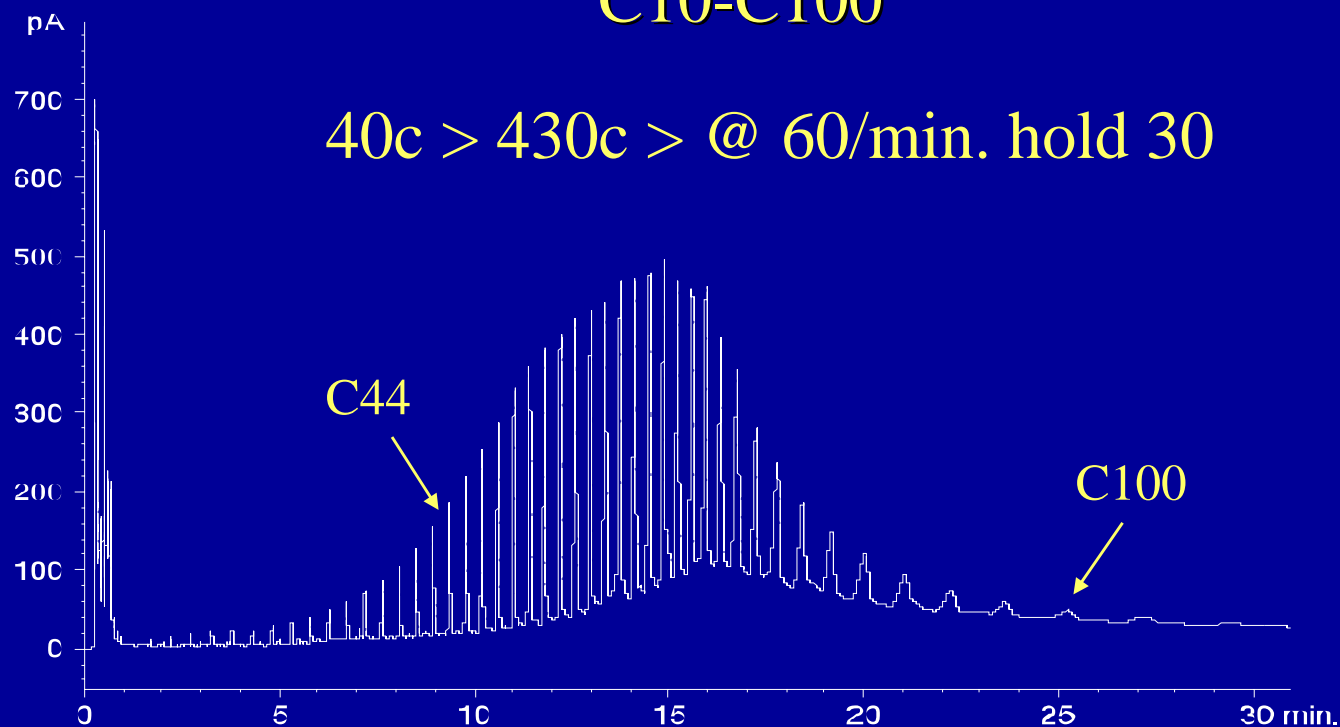
40c > 430c > @ 10/min. hold 20



Polywax 1000 60^c/minute ramp rate

C10-C100

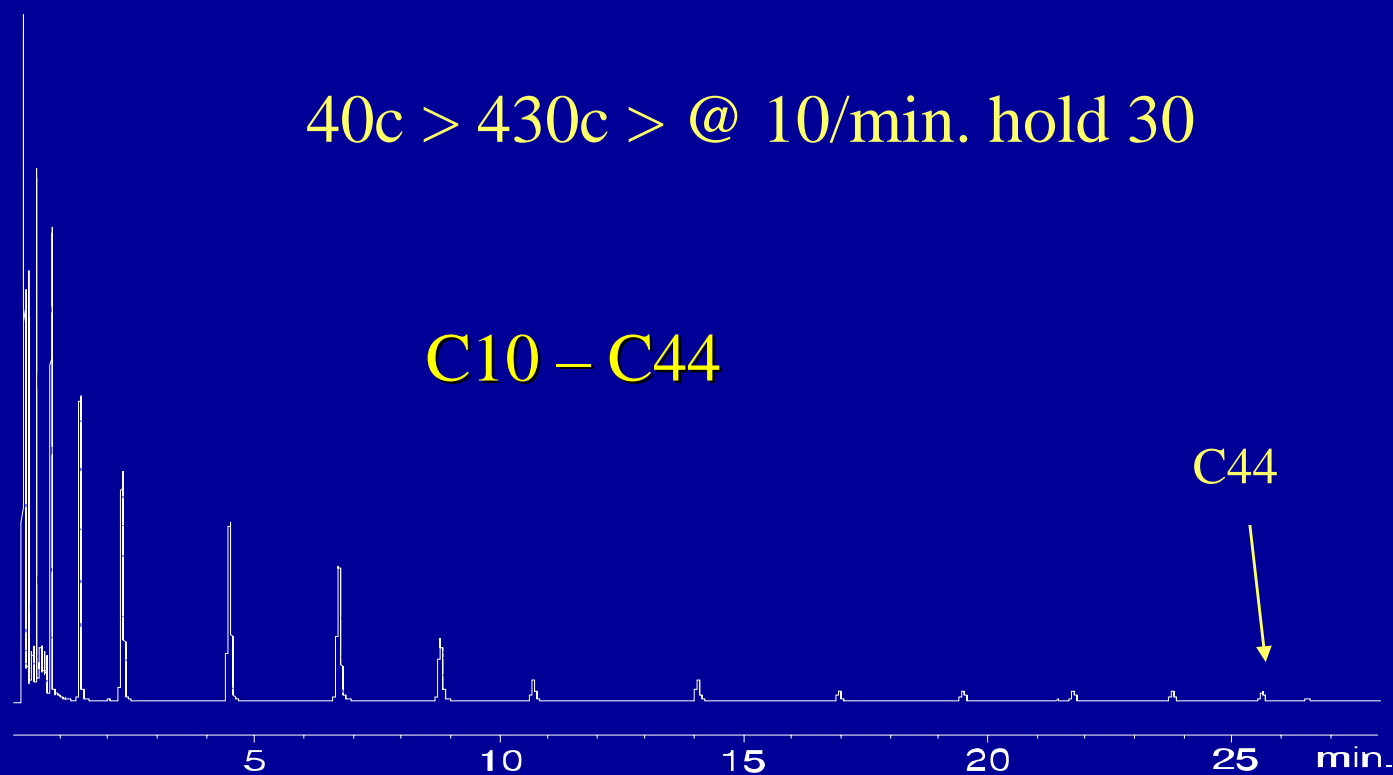
40c > 430c > @ 60/min. hold 30



MXT-1HT

40c > 430c > @ 10/min. hold 30

C10 – C44



MXT-1HT Strengths

- Advanced polymer manufacturing technology assures future reproducibility
- Column will not break
- Passive OD scoring will not weaken the column
- Column end will not fracture while inserting into cool on-column injectors, as with metal clad fused silica columns.

Conclusion

- Boiling point resolution
- Out of the box technology
- 100% non-polar
- Retention time reproducibility
- Symmetry hydrocarbon peaks
- Low Column bleed
- Superior column longevity