

Rtx 1HT SimDist Packed Column

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Project Objective

- Develop a PDMS polymer and column that is thermally stable, possess low bleed characteristics, yields symmetrical hydrocarbon peak shape and elutes hydrocarbons according to boiling point. The polymer should be acceptable for use in both GC packed columns, metal capillary tubing and fused silica and meet all ASTM method D-2887-93 and D3710-93 criteria.

Polymer Characteristics

- Low bleed at 430 c thus mitigating baseline subtraction which leads to errors if the baseline is not reproducible.
- Non-polar so as not to affect the elution of the hydrocarbons.
- Ability to be cross-linked with diatomaceous earth solid supports, fused silica and metal capillary tubing.
- Must elute hydrocarbons in order of increasing boiling point and conform to ASTM method D-2887-93 and D 3710-93 criteria.
- Out of the box and running in under 30 minutes.

Solid Support Characteristics

- Low trace metal content to prevent sample interaction.
- Classified to a narrow particle size distribution.
- Non-polar deactivation so as not to effect the elution of the hydrocarbons.

Tubing Characteristics

- The tubing ID must be free of oils associated with the manufacturing process so as not to contribute to peak tailing or artifacts in the baseline during temperature programming.
- Sulfinert deactivated to prevent any interaction with the petroleum sample.

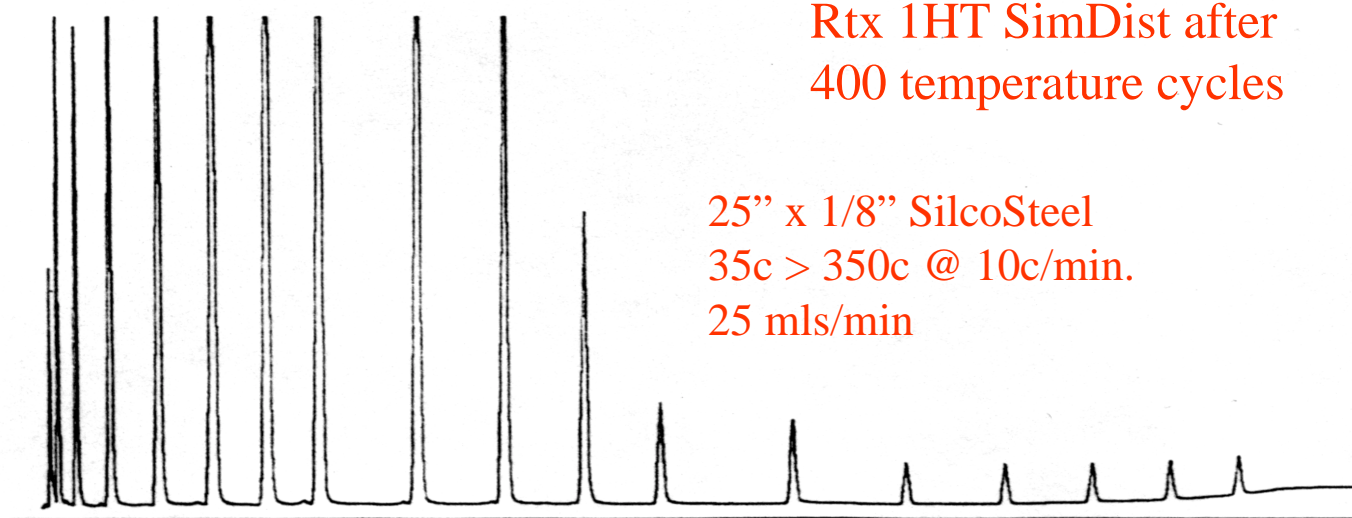
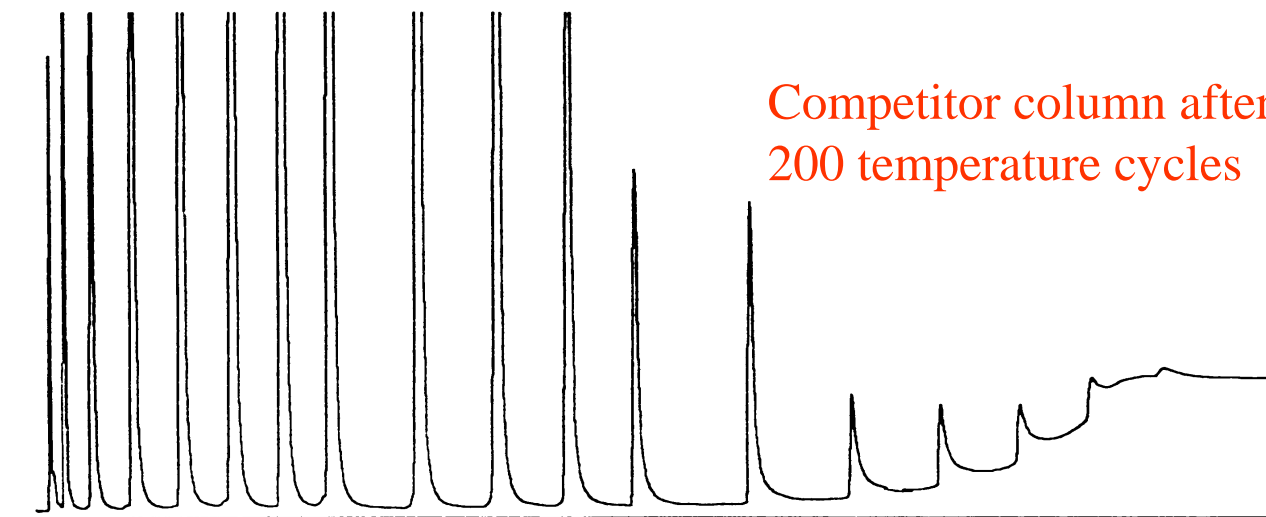
Column Reproducibility Data

●	Min. Rt.	Max. Rt.	Ave Rt.	Std. Dev.
● C5	0.241	0.243	0.242	0.001
● C6	0.493	0.497	0.495	0.002
● C10	5.746	5.765	5.752	0.005
● C20	18.482	18.491	18.486	0.004
● C28	25.093	25.103	25.098	0.004
● C40	32.160	32.171	32.166	0.004
● C44	34.316	34.328	34.326	0.007

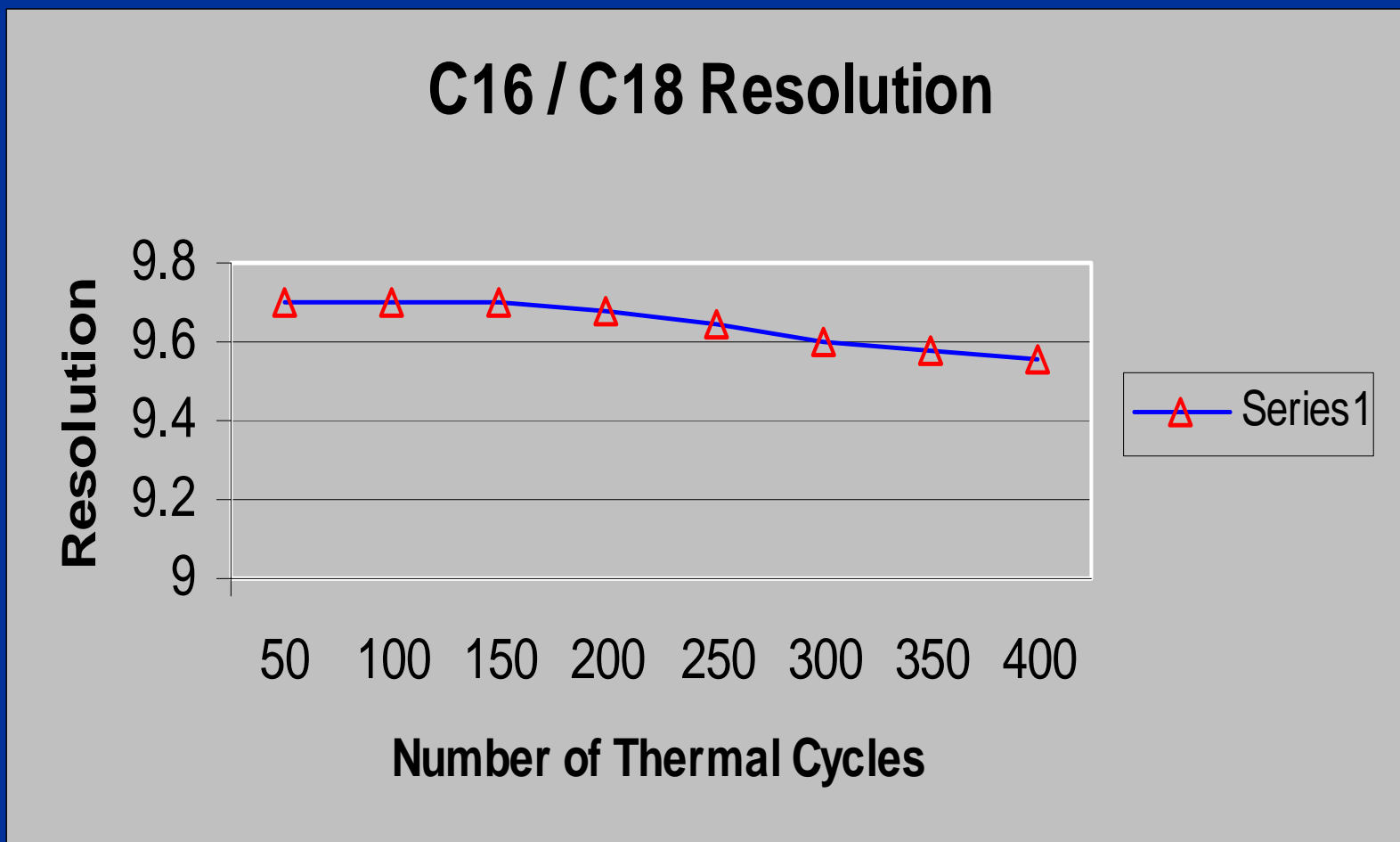
Reference Gas Oil #1 Data

	<u>ASTM consensus</u>	<u>ASTM</u>	<u>Rtx-1HT</u>	<u>Std. Dev.</u>
<u>IBP</u>	<u>Range</u>	<u>Avg.</u>	<u>Avg.</u>	
5	140-146	143	141.2	0.29
10	165-173	169	167.3	0.29
20	217-225	221	218.0	0.87
30	254-262	258	255.7	0.58
50	307-317	312	310.5	0.50
70	349-359	354	353.7	0.29
80	371-382	376	375.7	0.29
90	399-409	404	403.5	0.00
FBP	462-488	475	466.8	0.58

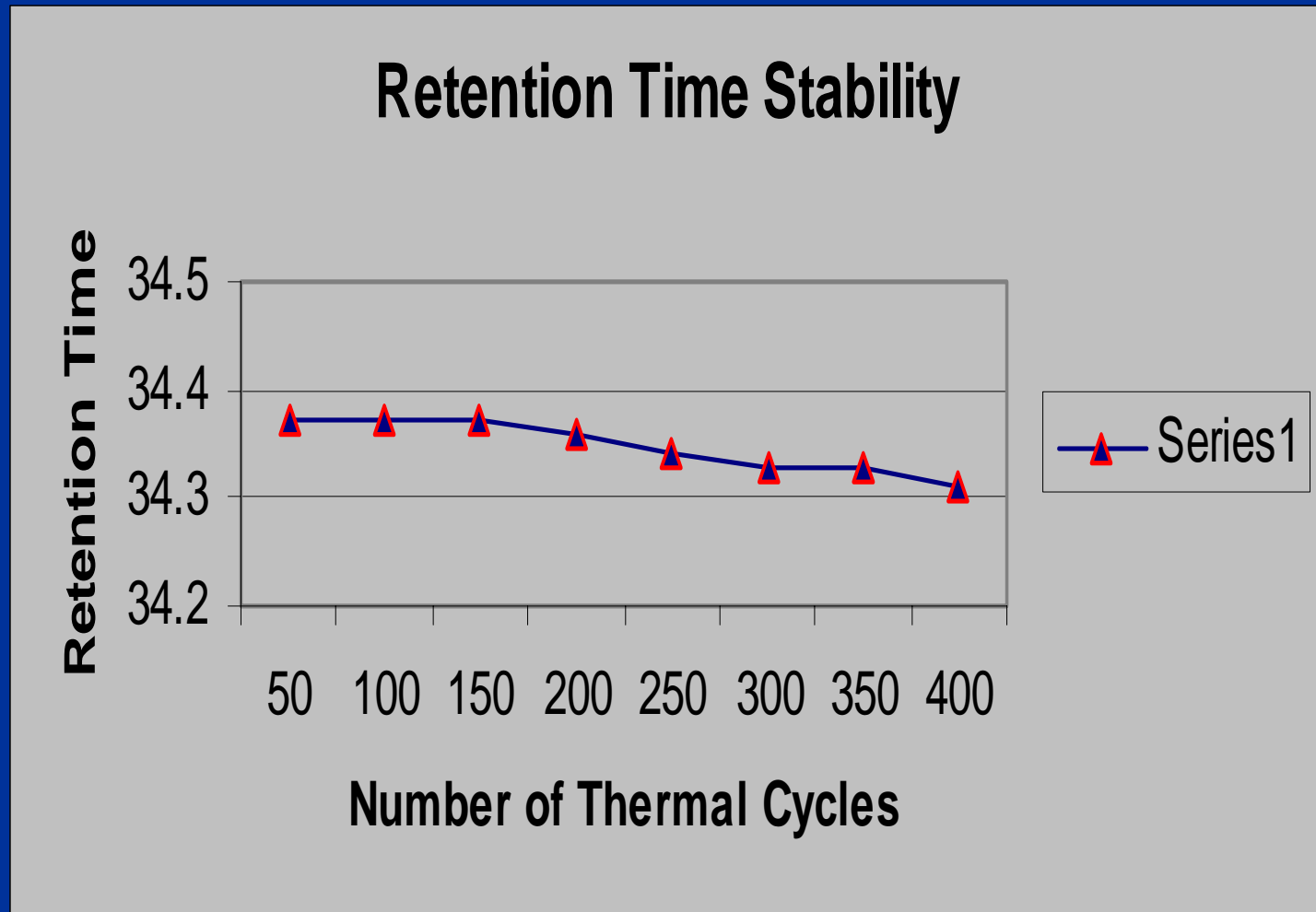
Column Longevity Data



Performance After 400 Thermal Cycles to 350 C



C44 Retention Time Stability



Conclusion

Simulated distillation is the most common analysis performed in petroleum laboratories. D-2887 and D-3710 can be done using either a packed or capillary column. The new Rtx 1HT column is 100 % PDMS, totally immobilized, thermally stable to 430 c and exceeds all ASTM method D-2887-93 and D-3710-93 criteria. The Rtx 1HT SimDist packed column is the perfect choice, requiring minimal conditioning (< 30 min.) and yielding a stable baseline, excellent peak symmetry and reproducible retention times right out of the box.