

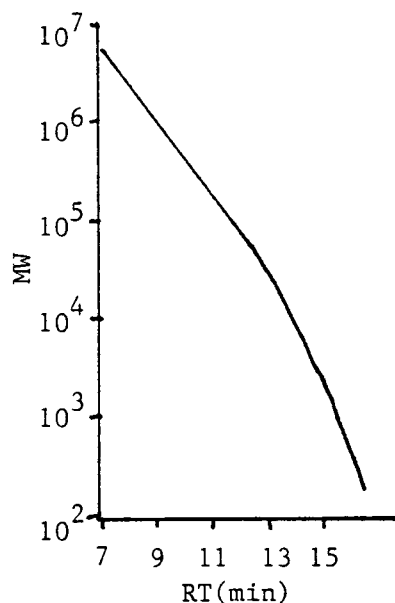
GPC REPRODUCIBILITY

The reproducibility of a system utilized for gel permeation chromatography (GPC) is of extreme importance. A chemist using any of the other forms of liquid chromatography would not be overly concerned with a retention time (RT) shift from 8.00 to 8.08 minutes (1%). Figure 1 demonstrates that a 1% increase in RT results in a 7 to 10% increase in molecular weight (MW) due to the fact that the molecular weight changes logarithmically with retention time (Figure 2).

FIGURE 1

<u>RT</u>	<u>Molecular Weight</u>
8.00	2,975,520
8.08	2,704,470
9.00	1,040,600
9.09	959,107

FIGURE 2



The following is a summary of the calculated molecular weight averages of 23 injections of a polyvinyl chloride (PVC) sample.

FIGURE 3

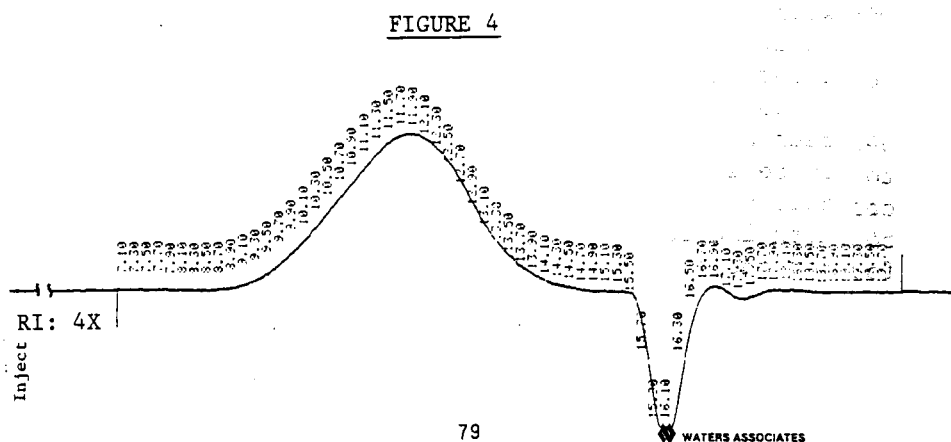
SUMMARY OF CALCULATED MOLECULAR WEIGHT AVERAGES*

	<u>\bar{M}_n</u>	<u>\bar{M}_w</u>	<u>\bar{M}_z</u>	<u>\bar{M}_w/\bar{M}_n</u>
Mean	63,200	145,800	266,200	2.30
Std.Devn.	2,400	3,400	8,900	0.07
% RSD	3.82	2.64	3.35	3.06

* Calculated molecular weight averages based upon linear, narrow distribution polystyrene standards.

See reverse side for chromatogram.

Figure 4 is a chromatogram representative of those utilized for the calculations in Figure 3. As mentioned before, a 1% change in RT results in a 7-10% change in molecular weight. Since the per cent standard deviation for the molecular weight calculations in Figure 3 ranged from 2.6% to 3.8%, the per cent change in RT must have been very small. In fact, all chromatograms could be overlaid perfectly.



CONDITIONS

Columns: 10^4 , 10^5 ULTRASTYRAGELTM (15,413 pl/ft)
Sample: PVC; 0.25% (w/v) in THF
Injection Volume: 150 μ l
Mobile Phase: THF
Flow Rate: 1.5 μ l/min

The analyses were completed on a system which consisted of a M6000A pump, WISPTTM injector and a Model R401 Differential Refractometer. The Model 730 Data Module was utilized for calculating molecular weight averages.

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