Application Note

745021X

Reproducibility of Retention Times and Peak Area in Extreme High Pressure Liquid Chromatography System (X-LC®)

Introduction

We examined the usefulness of an X-LC system utilizing an X-PressPak C18S column (2.1 mm.I.D. x 50 mm L.) packed with 2 µm diameter packing material for the ultra-high speed separation by evaluating the reproducibility of retention time and peak area.

Experimental

The X-LC utilized in this experiment was a JASCO X-LC system consisting of a 3185PU pump, 3080DG degasser, 3067CO column oven, 3070UV UV/Vis detector, 3059AS autosampler and a chromatography data system.

A standard mixture contains acetaminophen, caffeine, aspirin, and benzoic acid.

Results and Discussion

Figure 1 shows overlaid chromatograms obtained by fifteen replicate injections of the standard mixture. The X-LC system provides an analysis time shorter than one minute.

Table 1 shows the reproducibility of retention time and peak area Relative standard deviation, RSD, of retention time is between 0.09% and 0.26%, and that of peak area is between 0.38% and 0.86%. These results consider the X-LC system to be an excellent separation technique.

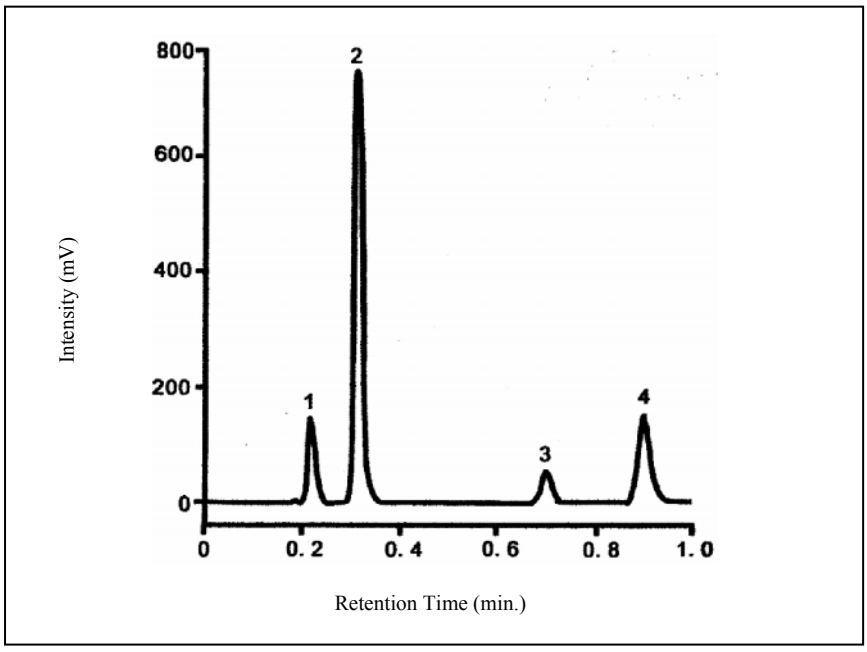

Figure 1 Overlaid chromatograms of the standard mixture Peaks: 1=acetaminophen (0.1 mg/mL), 2=caffeine (0.1 mg/mL), 3=aspirin (0.1 mg/mL), and 4=benzoic acid (6.0 mg/mL) Chromatographic conditions: column =X-Presspak C18S (2,1 mm I.D. x 50 mm L., 2 µm), mobile phase = $H_2O/CH_3CN/CH_3COOH$ (75/25/3), column temperature = 45 ºC, flow rate = 0.6 mL/min, detection wavelength = 275 nm, injection volume = 1 µL

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Table 1 shows reproducibility of retention times and peak areas (RSD%: Relative Standard Deviation). RSD of retention times were found to be 0.01 – 0.26% and those of peak areas, 0.38 – 0.86%, proving that the excellent results were obtained by *X-LC*.

Table 1 Reproducibility of retention times and peak area (n=15)

	Reproducibility at hold time			Reproducibility in peak area		
	Average (min.)	Standard deviation (min.)	Relative standard deviation (%)	Average (μV*sec)	Standard deviation (μV*sec)	Relative standard deviation (%)
Acetaminophen	0.214	0.00055	0.2570	310973	1239	0.3985
Caffeine	0.308	0.00070	0.2273	1814246	9656	0.5322
Aspirin	0.698	0.00075	0.1074	188500	1615	0.8568
I.S.	0.895	0.00080	0.0089	536004	2005	0.3740

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