Waters® 2700
Sample Manager
Effective, Fast Reduction of Carryover

The programmable wash pump of the Waters 2700 Sample Manager allows the user to minimize carryover between injections. Low carryover between standards and unknowns is crucial for the production of quantitative results at low detection limits with high confidence. Reduction of carryover is especially critical in high sensitivity applications such as those using mass spectrometry or fluorescence detection.

Using variable rinse volumes, a 20 µL injection of a mixture containing methyl, ethyl, and propyl paraben (0.10 mg/mL of each in methanol) was performed by the 2700 Sample Manager. Following the sample run, a blank (20 µL of methanol) was injected. Carryover was calculated by dividing the area counts of the peaks in the blank by the area counts of the peaks in the paraben mixture. Peak area counts in the blank, with less than 2 times signal to noise, were not used to calculate carryover.

Rinse Volume (µL)	% Carryover Methyl Paraben	Ethyl Paraben	Propyl Paraben
0	2.10	1.52	1.86
50	1.26	1.18	1.22
100	0.67	0.63	0.75
150	0.41	0.30	0.37
200	0.32	0.10	0.19
250	0.11	0.00	0.00
300	0.00	0.00	0.00
450	0.00	0.00	0.00

Waters 2700 Sample Manager -- Run Window

Project: Carryover_Study   System: 515_2487_2700   Loop Vol. (µL): 20   View Log File

	Sample Group	# of Inj's	µL Sample	µL Rinse	Millen. Method Set	Runtime, min	HPLC Column	Pre-treatment	FC
1	CARRYOVER	1	20	450	Parabens	2.8	4.6X75 Sym C18		
2	CARRYOVER	1	20	300	Parabens	2.8	4.6X75 Sym C18		
3	CARRYOVER	1	20	250	Parabens	2.8	4.6X75 Sym C18		
4	CARRYOVER	1	20	200	Parabens	2.8	4.6X75 Sym C18		
5	CARRYOVER	1	20	150	Parabens	2.8	4.6X75 Sym C18		
6	CARRYOVER	1	20	100	Parabens	2.8	4.6X75 Sym C18		
7	CARRYOVER	1	20	50	Parabens	2.8	4.6X75 Sym C18		
8	CARRYOVER	1	20	0	Parabens	2.8	4.6X75 Sym C18		
9									
10									
11									
12									

Start ▶   Pause ‖   Stop ∎   Position: Samp.#: /   Inj.#: /   Quit
Operational Status: Idle

Waters Corporation   34 Maple Street   Milford, MA 01757   508 478 2000

Paraben Stock Solution

Blank after 0 µL Rinse Volume

Blank after 50 µL Rinse Volume

Blank after 100 µL Rinse Volume

Blank after 150 µL Rinse Volume

Blank after 200 µL Rinse Volume

Blank after 250 µL Rinse Volume

Blank after 300 µL Rinse Volume
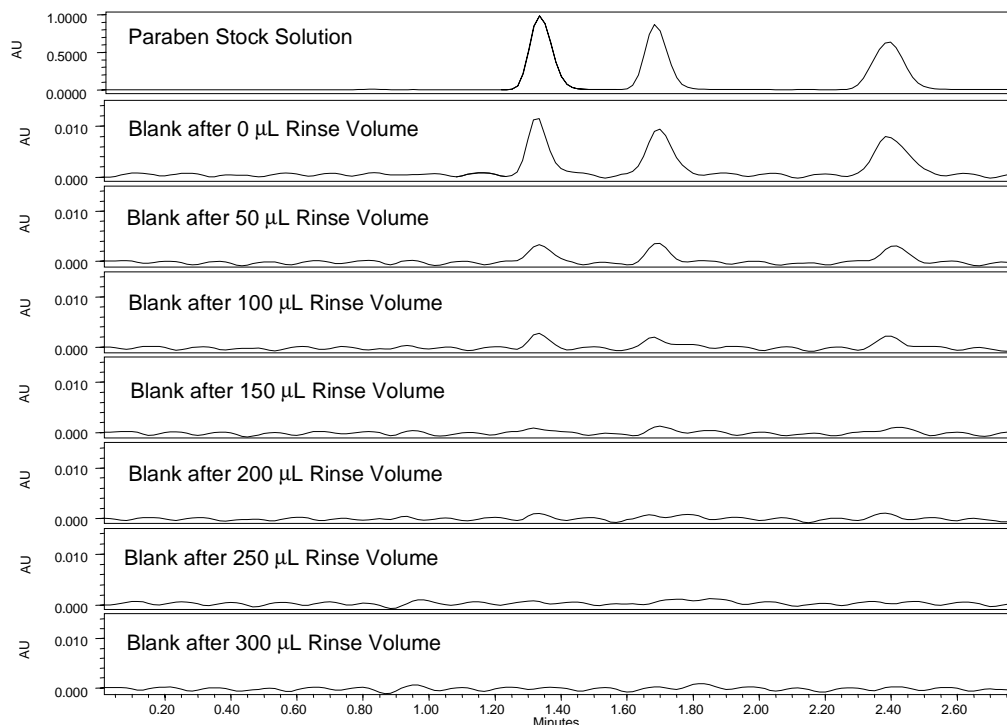
Minutes

Instruments:
Waters 2700 Sample Manager
Waters 515 HPLC Pump
Waters 2487 Detector: (254 nm)
Eluent: 65% Methanol, 35% Water
Flow: 1 mL/minute
Sample: Methyl Paraben, Ethyl Paraben, Propyl Paraben
Column: Symmetry® C_{18}, 4.6 x 75 mm (ambient temperature)
Wash Solvent: 60% Methanol, 40% Water

The ability to program the rinse volume on the 2700 Sample Manager provides control of carryover. In high carryover situations, the 2700 can be used to confirm that the carryover has been effectively minimized.   It is this feature that enables the Waters 2700 Sample Manager to inject concentrated samples (for semi-prep separation), collect fractions and re-inject analytical portions of those fractions without carryover interfering with the results.

The 2700 Sample Manager performs its rinse functions very quickly; the total time for a 450 µL rinse is less than 20 seconds. This high level of speed is necessary when running high throughput direct injection or flow analysis.

An experiment such as this one should be performed when working with new compounds, samples, or processes to understand when rinse volume and rinse solvent composition are optimized.