ANALYSIS OF BLOOD PLASMA SAMPLES USING SIFT-MS

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INTRODUCTION

Selected Ion Flow Tube Mass Spectrometry (SIFT-MS) is a real-time volatile organic compounds (VOCs) analyser. It has been shown to be suitable for a diverse range of applications, and when used in combination with the GERSTEL MPS, enables very rapid sample headspace analysis. By using aqueous calibration standards, it has been possible to analyse blood plasma samples for solution concentrations of both cyclohexanone and cyclohexanol.

METHODS

1 mL of plasma was sealed in a 20 mL headspace vial and incubated for 10 minutes at 40°C before 2.5 mL of headspace was injected into the SIFT-MS (Table 2, figure 3). Calibration standards of cyclohexanol and cyclohexanone were prepared at 50 ppm in 0.1M NaCl and were run prior to the plasma samples (figure 2). Linearity of the method was checked between 5 and 200 ppm (Table 1, figure 1).

RESULTS

Solution concentration (ppm)	Cyclohexanol (ppbV)	Cyclohexanone (ppbV)
5	26.8	64.7
10	51.7	123
25	120	309
50	264	583
75	370	938
100	517	1169
200	999	2289

Table 1 – Linearity of cyclohexanol and cyclohexanone solutions

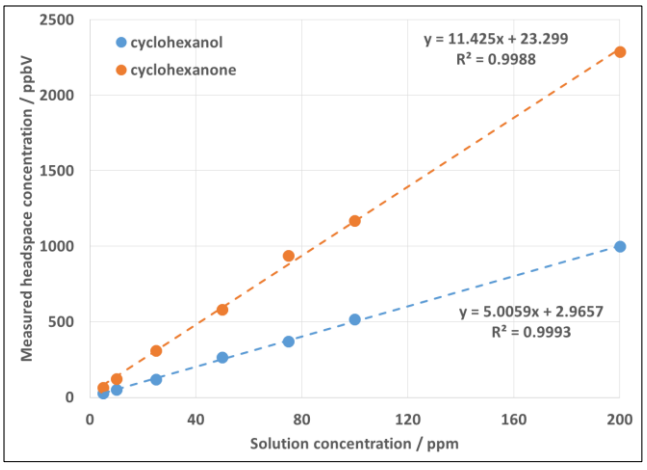

Figure 1 – Linearity of cyclohexanol and cyclohexanone solutions

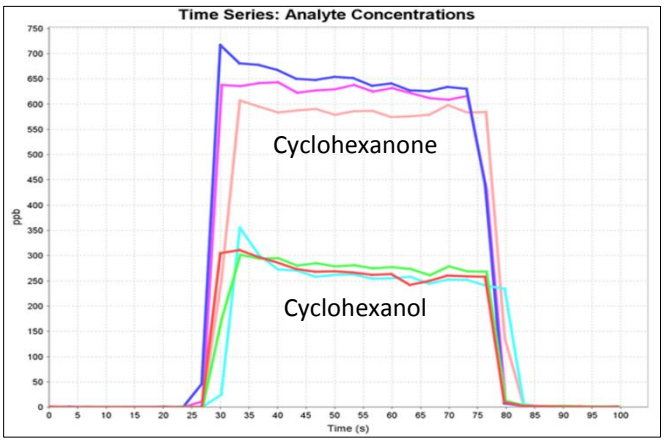

Figure 2 – 50ppm calibration standards

Sample	Measured (ppbV) Cyclo-hexanol	Measured (ppbV) Cyclo-hexanone	Calculated (ppm) Cyclo-hexanol	Calculated (ppm) Cyclo-hexanone
1	2.8	1.1	0.5	0.1
2	648	357	120	29
3	289	252	53	21
4	1550	577	286	47
5	2470	489	456	40
6	1990	583	367	47
7	3810	582	703	47
8	2810	502	519	41

Table 2 – Analysis of sample solutions

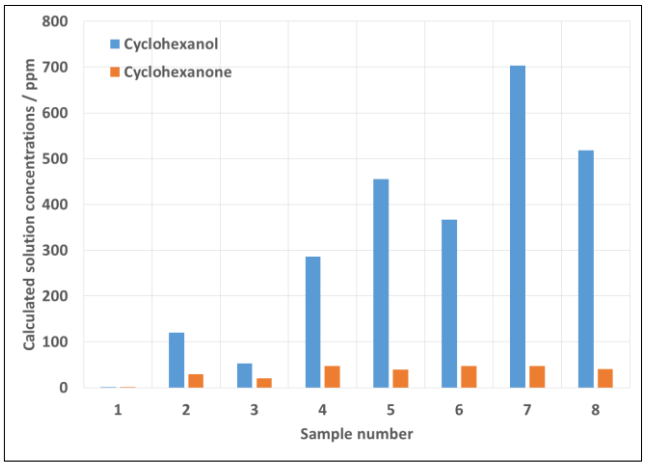

Figure 3 – Analysis of sample solutions

CONCLUSION

It has been shown that a calibration approach allows for the analysis of aqueous solution concentrations using automated SIFT-MS in a rapid and robust manner.

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