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Analysis of Potassium Dichromate Breath Test Solution
after Storage for Sixteen Years

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ANALYSIS OF POTASSIUM DICHROMATE BREATH TEST SOLUTION
AFTER STORAGE OF SIXTEEN YEARSIntroduction

Potassium dichromate solutions are known to be very stable (1). However, the issue of the stability of the potassium dichromate breath test solution used in the Breathalyzer is raised occasionally in court. Recently breath test ampoules that were manufactured over 16 years ago and were originally analysed at this laboratory were discovered in the field and reanalysed.

These ampoules were stored at a municipal police station and were only used during "Police Week".

Results

Breath test solution lot #48018 was originally analysed June 15, 1970 and was found to have a specific gravity of 1.525 and 0.0258% $K_2Cr_2O_7$. The analysis in 1986 shows a specific gravity of 1.523 and 0.0253% $K_2Cr_2O_7$. This concentration of potassium dichromate is still within the specifications of the Breath Test Committee. (2)

The ampoules were photometrically uniform and had a decreased workload of 10 - 30 mg/dL on the Breathalyzer when compared to recently manufactured ampoules. This decreased workload is consistent with the slight decrease in potassium dichromate concentration.

The ampoules all gauged properly indicating an outside diameter of 16.0 - 16.5 mm. The volume of solution in these ampoules were 3.02 to 3.06 mL (mean 3.04 mL).

A total of twelve simulator tests were conducted on these ampoules and were compared to twelve tests on recently manufactured ampoules (lot #2975). The results are shown in Table 1. The t-test value of 0.28977 indicates no significant differences in the results of the two lots.

Conclusion

Potassium dichromate breath test solution stored for 16 years was stable and could still be used in the Breathalyzer without significantly affecting the results. Only a slight decrease in potassium dichromate concentration was apparent.

Acknowledgements

Special thanks to Provincial Constable Larry Proctor for providing ampoules lot #48018, and to R.A. Hallett who did the original analysis.

References

1. Jones, F.T. and Volpe, A.A.
Storage Properties of Breathalyzer Test Ampoules. J. Stud. Alc. 40 (11) 1039-1045, 1979.
2. Canadian Society of Forensic Sciences Breath Test Committee "Recommended Breath Testing Standards and Procedures" pg. 6, 1983.

TABLE 1: Comparison of Simulator Tests at a Concentration of 100 mg/dL

<u>Lot #</u>	<u>n</u>	<u>Mean</u>	<u>S.D.</u>	<u>C.V%</u>	<u>Range</u>
40818	12	98.5	1.31	1.33	96 - 100
2975	12	98.3	1.50	1.53	96 - 100

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