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FORENSIC TESTING PROGRAM

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# Quantitative Drug Analysis - Methamphetamine HCl
# Test No. 24-5051 Summary Report

Each sample set consisted of two items containing different concentrations of methamphetamine hydrochloride (HCl). Participants were asked to determine the concentration of methamphetamine HCl in each item. Data were returned from 103 participants and are compiled into the following tables:



This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

# Manufacturer's Information

Each sample set consisted of two items containing different concentrations of methamphetamine hydrochloride (HCl) and caffeine. Participants were asked to analyze each item and report the concentration of methamphetamine HCl in the sample.

SAMPLE PREPARATION: Prior to production, the appropriate amount of methamphetamine HCl and caffeine for each item were combined and thoroughly mixed to ensure homogeneity.

ITEMS 1 and 2 (PREPARATION): For each item, approximately 500 mg of the powder was weighed out and deposited into a glassine bag, which was folded and secured with a label. The folded glassine bag was placed into a small zip top bag, heat sealed and then placed into a pre-labeled envelope.

SAMPLE SET ASSEMBLY: One of each of the Item 1 and Item 2 envelopes was placed into a pre-labeled sample set envelope.

VERIFICATION: The laboratories that participated in predistribution received additional specimens for duplicate testing of each item. Predistribution results were consistent with each other and the manufacturer's preparation information. The labs used the following combined list of examination methods: NMR, GC/FID.

| Item | Preparation Concentration - Methamphetamine HCl |
|---|---|
| 1 | 91% |
| 2 | 74% |

Please note that the preparation concentration is the value used for calculations during the test preparation phase and may not necessarily represent the final concentration of the samples. It is advised to wait for the Grand Mean statistics available in this Summary Report as well as wait for the Individual Reports before evaluating performance.

# Summary Comments

This test was designed to allow participants to assess their proficiency in the determination of powdered methamphetamine hydrochloride (HCl) concentrations. Each sample set consisted of two items containing caffeine and different concentrations of methamphetamine HCl. Participants were asked to determine the methamphetamine HCl concentration for both items. Refer to the Manufacturer's Information for preparation details.

The results are separated into two tables: reported results (Table 1) and raw analytical data (Table 3). The table of reported results shows the concentration that each participant would report according to their normal reporting procedures (e.g. mean, lowest result, truncated results). The table of raw analytical data shows the results from each determination made by the laboratory to produce their reported results. The most common reporting procedure amongst participants was using the mean of duplicate/several determinations.

The raw data was used to calculate the grand mean and the standard deviation for each item. Participants with extreme data (±5 STD from grand mean) have been marked with an "X", and their results were excluded from the calculations of the grand mean and standard deviation. Of the 103 responding participants, four participants were marked as extreme for both Items 1 and 2. One additional participant did not report raw data determinations for either item. The calculated grand mean concentration of Item 1 was 90.99% with a standard deviation of 1.634, and the grand mean concentration of Item 2 was 73.81% with a standard deviation of 1.896. These calculations are supplied to assist the participants and accrediting bodies in determining the acceptability of the results.

Participants used a variety of methods to analyze the samples. The most common method of analysis utilized was GC/FID.

As a supplemental examination of the raw data, Bivariate Control Analysis was also performed to analyze the measurement of both samples simultaneously. In this analysis, a comparative performance value (CPV) is provided for each participant, which is a unitless ratio indicating the number of standard deviations a participant's results are from the Grand Mean. The closer a participant's CPV is to zero, the more consistent their results are with the other participants' data. For the graphical portion, an ellipse was drawn so that 99% of the time, a randomly selected participant was inside of it. Three participants with results that fell outside the 99.5% control limit have been marked with an "X", and their results were excluded from the calculations for this supplemental examination. One participant that did not report raw data for either item was marked with an "M" and also excluded from the calculations. For more information regarding Bivariate Control Analysis, please see the supplemental section at the end of this report.

# Reported Results

*What is the concentration of methamphetamine HCl in each of the samples?*

TABLE 1

| WebCode | Item 1 Reported Concentration (units) | Item 2 Reported Concentration (units) | Uncertainty (k) |
|---|---|---|---|
| **Preparation concentration:** | **91%** | **74%** | |
| 2B2BGD | 89.8 ± 1.7 (%) | 74.3 ± 1.7 (%) | 2 |
| 2JW7JH | 91 ± 8 (%) | 71 ± 6 (%) | 3 |
| 3ZH3AB | 93.2 ± 5.8 (%) | 75.7 ± 5.8 (%) | 1.99 |
| 4A3TA9 | 86 ± 0 ((ng/ml)%) | 64 ± 0 ((ng/ml)%) | 0 |
| 4EDUEC | 91.8 ± 1.7 (wt %) | 74.7 ± 1.7 (wt %) | 2 |
| 4V3ZQC | 90.8 ± 4.8 (% w/w) | 74.6 ± 4.2 (% w/w) | |
| 6GX7QM | 91 ± 12 (%) | 73 ± 9 (%) | 3 |
| 6WD8MD | 90.4 ± 3.44 (%) | 74.8 ± 2.84 (%) | 2 |
| 7ACHM6 | 77.9 ± 0.937 (percent) | 60.5 ± 2.092 (percent) | 2 |
| 7CKNA7 | 91.9 ± 4.1 (%) | 73.7 ± 4.1 (%) | 2 |
| 7GDKZH | 92.4 ± 7.1 (%) | 74.1 ± 6.3 (%) | 2.65 |
| 7JGP36 | 71,9 (%) | 49,9 (%) | |
| 7M362D | 90.5 ± 3.35 (%) | 72.3 ± 2.67 (%) | 2 |
| 88JY74 | 95.6 ± 7.8 (%) | 77.1 ± 7.8 (%) | 2 |
| 8ENXHE | 92.6 ± 7.2 (percent) | 74.6 ± 5.8 (percent) | 2.65 |
| 8JDFU6 | 91.0 ± 4.1 (%) | 72.7 ± 4.1 (%) | 2 |
| 8L4E94 | 93 (%) | 77 (%) | |
| 8P4P64 | 90 ± 12 (%) | 72 ± 9 (%) | 3 |
| 96DVWE | 92.5 ± 8.2 (percent) | 75.4 ± 5.8 (percent) | 2.65 |

TABLE 1

| WebCode | Item 1<br>Reported Concentration (units) | Item 2<br>Reported Concentration (units) | Uncertainty (k) |
|---|---|---|---|
| **Preparation concentration:** | **91%** | **74%** | |
| 9E2RU9 | 89 ± 3 (%) | 73 ± 3 (%) | 2 |
| 9R6ZQ6 | 0.44 ± 0.02 (g) | 0.36 ± 0.02 (g) | 2 |
| 9ZFCQA | 92.6 ± 3 (%) | 75.6 ± 2.5 (%) | 3 |
| AJDUKB | 90 ± 8 (%) | 72 ± 6 (%) | 3 |
| BLUJF8 | 89 ± 3.66 (w/w %) | 75 ± 3.08 (w/w %) | 2 |
| BNFKX2 | 91.0 ± 2.1 (%) | 74.7 ± 2.1 (%) | 2 |
| BUHJM6 | 91.5 ± 2.0 (% by weight) | 74.5 ± 2.0 (% by weight) | 2 |
| C88NLT | 92 ± 9 (%) | 74 ± 7 (%) | 2 |
| CGCVZT | 0.43 ± 0.05 (grams) | 0.34 ± 0.04 (grams) | 3 |
| CVEAF6 | 92.0 ± 1.7 (%) | 73.1 ± 1.7 ( %) | 2 |
| CYEKB6 | 91.4 ± 1.7 (%) | 76.2 ± 1.7 (%) | 2 |
| D3V6VY | 89.6 ± 4.1 (%) | 72.3 ± 4.1 (%) | 2 |
| D7W9P8 | 90 ± 8 (% as HCl) | 71 ± 6 (% as HCl) | 3 |
| E6U3JW | 97.2 ± 7.8 (Percent) | 79.0 ± 7.8 (Percent) | 2 |
| ED9PT2 | 90.5 ± 1.7 ( %) | 73.2 ± 1.7 ( %) | 2 |
| EFGYP6 | 88.1 ± 8.81 (%) | 71.0 ± 7.10 (%) | 2 |
| EHJV98 | 92.2 ± 7.4 (%) | 75.4 ± 7.2 (%) | 2.65 |
| EV2WFX | 91.30 ± 8.10 (%) | 74.80 ± 6.70 (%) | 3 |
| EZZ499 | 88.83 ± 6.16 (%) | 72.52 ± 6.16 (%) | 2 |
| FDHD7X | 90.2 ± 1.6 (%) | 73.8 ± 1.6 (%) | 2 |

TABLE 1

| WebCode | Item 1<br>Reported Concentration (units) | Item 2<br>Reported Concentration (units) | Uncertainty (k) |
|---|---|---|---|
| **Preparation concentration:** | **91%** | **74%** | |
| FNYXQU | 94.9 ± 7.8 (%) | 77.7 ± 7.8 (%) | 2 |
| GC7Z22 | 90.9 ± 7.9 (%) | 73.0 ± 6.3 (%) | 3 |
| GGX4A8 | 92.3 ± 7.5 (%) | 74.6 ± 5.8 (%) | 2.65 |
| GNGBRC | 92 ± 12 (%) | 74 ± 10 (%) | 3 |
| H4KA8T | 92.6 ± 2.8 (%) | 75.7 ± 2.3 (%) | 3 |
| H8PTD2 | 90.7 ± 3.35 (%) | 70.8 ± 2.62 (%) | 2 |
| HWTPCT | 90.72 ± 4.0 (%) | 77.59 ± 4.2 (%) | 2 |
| HYXDT4 | 88.9 ± 3.5 (%) | 72.9 ± 3.5 (%) | 3 |
| J3EXDX | 90 ± 5 (%) | 71 ± 5 (%) | 2 |
| JDRGBZ | 91.17 ± 8 (%) | 74.34 ± 7 (%) | 3 |
| JKN4ET | 89.72 | 72.65 | |
| K4GEPY | 89 ± 8 (percent as HCl salt) | 72 ± 7 (percent as HCl salt) | 3 |
| K8XT6T | 88.6 ± 1.3 (%) | 73.0 ± 1.3 (%) | 2 |
| K8ZEZ9 | 91 ± 12 (%) | 74 ± 10 (%) | 3 |
| K9C9MZ | 0.42 ± 0.03 (grams) | 0.37 ± 0.02 (grams) | 2 |
| KHZ6JU | 90.1 ± 7.0 (percent) | 72.2 ± 5.6 (percent) | 2 |
| KMR9DY | 90 ± 3 (%) | 72 ± 3 (%) | 2 |
| KQGG23 | 90.6 ± 7.5 (%) | 74.1 ± 6.7 (%) | 2.65 |
| KXATWV | 89.8 ± 6.9 (%) | 73.5 ± 5.7 (%) | 2 |
| KYKVJU | 89.7 ± 1.7 (%) | 75.0 ± 1.7 (%) | 2 |

TABLE 1

| WebCode | Item 1<br>Reported Concentration (units) | Item 2<br>Reported Concentration (units) | Uncertainty (k) |
|---|---|---|---|
| **Preparation concentration:** | **91%** | **74%** | |
| L3W62Q | 89.2 ± 1.3 (%) | 72.9 ± 1.3 (%) | 2 |
| L3ZPW7 | 90.5 ± N/D (%) | 72.2 ± N/D (%) | N/D |
| L8UJWT | 91.0 ± 1.3 (%) | 75.0 ± 1.3 (%) | 2 |
| M3HVWW | 91.2 ± 5.74 (%) | 75.2 ± 4.74 (%) | 2 |
| M8UYMY | 89.0 ± 3.5 (%) | 72.3 ± 3.5 (%) | |
| MTUZY2 | 93.1 ± 11.4 (%) | 76.5 ± 7.9 (%) | 2.65 |
| N3FF6G | 89 ± 3 (%) | 73 ± 3 (%) | 2 |
| N89KWZ | 92.2 ± 7.2 (%) | 75.3 ± 5.9 (%) | 2.65 |
| NABMGV | 90.2 ± 3.43 (%) | 73.1 ± 2.78 (%) | 2 |
| NAV8NM | 90 ± 12 (%) | 74 ± 10 (%) | 3 |
| P6ZRGR | 73.0 ± 8.2 (%) | 58.3 ± 6.5 (%) | 2 |
| PJKACG | 0.43 ± 0.06 (grams) | 0.35 ± 0.05 (grams) | 3 |
| PKLP8L | 87.29 | 72.09 | |
| Q3K2GL | 90.1 ± 1.3 (%) | 73.9 ± 1.3 (%) | |
| Q9RHXM | 92.5 ± 1.3 (%) | 74.8 ± 1.3 (%) | 2 |
| QD9QLM | 91.2 ± 4.1 (%) | 73.3 ± 4.1 (%) | 2 |
| QK6RFL | 90.1 ± 8.2 (%) | 72.1 ± 6.6 (%) | 3 |
| QY4M2T | 90 ± 8 (%) | 72 ± 6 (%) | 3 |
| R8GV3U | 91.2 ± 7.1 (%) | 74.3 ± 5.8 (%) | 2.65 |
| RJ63VP | 90.2 ± 1.7 (% by weight) | 74.1 ± 1.7 (% by weight) | 2 |

TABLE 1

| WebCode | Item 1<br>Reported Concentration (units) | Item 2<br>Reported Concentration (units) | Uncertainty (k) |
|---|---|---|---|
| **Preparation concentration:** | **91%** | **74%** | |
| RVNFDT | 89 ± 5 (%) | 73 ± 5 (%) | 2.05 |
| TAYFMP | 90 ± 5 (%) | 72 ± 5 (%) | 2 |
| TEBNMT | 90.25 ± 6.16 (%) | 73.98 ± 6.16 (%) | 2 |
| TG2M2R | 90 ± 6 (percent) | 71 ± 6 (percent) | 2 |
| UUFE2H | 90.5 ± 4.1 (percent) | 71.2 ± 4.1 (percent) | 2 |
| VCZ6ZH | 91.4 ± 2.1 (%) | 74.3 ± 2.1 (%) | 2 |
| VJGV7A | 91 ± 3 (%) | 74 ± 3 (%) | 2 |
| VMG82A | 89 ± 3 (%) | 71 ± 3 (%) | 2 |
| VQZ7DJ | 90.7 ± 1.3 (%) | 72.5 ± 1.3 (%) | 2 |
| W9BBFL | 91.3 ± 2.5 (mg/ml) | 73.1 ± 2.2 (mg/ml) | 3 |
| WN432M | 90 ± 8 (%) | 71 ± 6 (%) | 3 |
| WT2D9F | 90.33 ± 10.70 (%) | 73.83 ± 8.80 (%) | |
| WWW87G | 92.2307 ± 0.6277694 (%) | 74.039 ± 00 (%) | |
| XJNUDN | 92 ± 6 (Percent) | 76 ± 6 (Percent) | 2 |
| YRXJQL | 91 ± 7 (%) | 74 ± 7 (%) | 2 |
| Z3CZUD | 90.4 ± 4.1 (%) | 72.4 ± 4.1 (%) | 2 |
| Z64Y9B | 92 ± 12 (%) | 74 ± 10 (%) | 3 |
| Z9F7AF | 89.8 ± 1.7 (% by weight) | 73.7 ± 1.7 (% by weight) | 2 |
| ZCJXHG | 90.5 ± 2.8 (%) | 72.3 ± 2.2 (%) | 2 |
| ZGUTHJ | 92.4 ± 7.76 (%) | 73.2 ± 6.15 (%) | 2 |

TABLE 1

| WebCode | Item 1<br>Reported Concentration (units) | Item 2<br>Reported Concentration (units) | Uncertainty (k) |
|---|---|---|---|
| **Preparation concentration:** | **91%** | **74%** | |
| ZL8TFB | 93.7 ± 7.8<br>(percentage) | 77.4 ± 7.8<br>(percentage) | 2 |
| ZPM24B | 91.2 ± 6.1 (wt%) | 75.4 ± 5.0 (wt%) | 3 |
| ZQYVMG | 0.44 ± 0.03 (grams) | 0.36 ± 0.02 (grams) | 2 |
| ZUY7JG | 0.45 ± 0.03 (grams) | 0.36 ± 0.02 (grams) | 2 |

# Reporting Procedures

TABLE 2

| WebCode | Reporting Procedures |
|---|---|
| 2B2BGD | The lowest value of duplicate/several determinations. |
| 2JW7JH | The mean of duplicate/several determinations. |
| 3ZH3AB | The mean of duplicate/several determinations. |
| 4A3TA9 | The mean of duplicate/several determinations. |
| 4EDUEC | The mean of duplicate/several determinations. |
| 4V3ZQC | The mean of duplicate/several determinations. |
| 6GX7QM | The mean of duplicate/several determinations. |
| 6WD8MD | The mean of duplicate/several determinations. |
| 7ACHM6 | The mean of duplicate/several determinations. |
| 7CKNA7 | The mean of duplicate/several determinations. |
| 7GDKZH | The mean of duplicate/several determinations. |
| 7JGP36 | The mean of duplicate/several determinations. |
| 7M362D | The mean of duplicate/several determinations. |
| 88JY74 | The mean of duplicate/several determinations. |
| 8ENXHE | The mean of duplicate/several determinations. |
| 8JDFU6 | The mean of duplicate/several determinations. |
| 8L4E94 | The mean of duplicate/several determinations. |
| 8P4P64 | The mean of duplicate/several determinations. |
| 96DVWE | The mean of duplicate/several determinations. |
| 9E2RU9 | The mean of duplicate/several determinations. |
| 9R6ZQ6 | The mean of duplicate/several determinations. |
| 9ZFCQA | The mean of duplicate/several determinations. |
| AJDUKB | The mean of duplicate/several determinations. |
| BLUJF8 | The mean of duplicate/several determinations. |
| BNFKX2 | The mean of duplicate/several determinations. |

# TABLE 2

| WebCode | Reporting Procedures |
|---|---|
| BUHJM6 | The mean of duplicate/several determinations. |
| C88NLT | The mean of triplicate, truncated/several determinations |
| CGCVZT | The mean of duplicate/several determinations. |
| CVEAF6 | The mean of duplicate/several determinations. |
| CYEKB6 | The mean of duplicate/several determinations. |
| D3V6VY | The mean of duplicate/several determinations. |
| D7W9P8 | The mean of duplicate/several determinations. |
| E6U3JW | The mean of duplicate/several determinations. |
| ED9PT2 | Average of terminal Methyl signal (S4) for each item. |
| EFGYP6 | The mean of duplicate/several determinations. |
| EHJV98 | The mean of duplicate/several determinations. |
| EV2WFX | The mean of duplicate/several determinations. |
| EZZ499 | The mean of duplicate/several determinations. |
| FDHD7X | The mean of duplicate/several determinations. |
| FNYXQU | The mean of duplicate/several determinations. |
| GC7Z22 | The mean of duplicate/several determinations. |
| GGX4A8 | The mean of duplicate/several determinations. |
| GNGBRC | The mean of duplicate/several determinations. |
| H4KA8T | The mean of duplicate/several determinations. |
| H8PTD2 | The mean of duplicate/several determinations. |
| HWTPCT | The mean of duplicate/several determinations. |
| HYXDT4 | The mean of duplicate/several determinations. |
| J3EXDX | The lowest value of duplicate/several determinations. |
| JDRGBZ | The mean of duplicate/several determinations. |
| JKN4ET | The mean of duplicate/several determinations. |
| K4GEPY | The mean of duplicate/several determinations. |

# TABLE 2

| WebCode | Reporting Procedures |
|---|---|
| K8XT6T | The mean of duplicate/several determinations. |
| K8ZEZ9 | The mean of duplicate/several determinations. |
| K9C9MZ | The mean of duplicate/several determinations. |
| KHZ6JU | The mean of duplicate/several determinations. |
| KMR9DY | The mean of duplicate/several determinations. |
| KQGG23 | The mean of duplicate/several determinations. |
| KXATWV | The mean of duplicate/several determinations. |
| KYKVJU | The mean of duplicate/several determinations. |
| L3W62Q | The mean of duplicate/several determinations. |
| L3ZPW7 | The mean of duplicate/several determinations. |
| L8UJWT | The mean of duplicate/several determinations. |
| M3HVWW | The mean of duplicate/several determinations. |
| M8UYMY | The mean of duplicate/several determinations. |
| MTUZY2 | The mean of duplicate/several determinations. |
| N3FF6G | Item 1 was mean of 5 integrals and Item 2 was mean of 4 integrals |
| N89KWZ | The mean of duplicate/several determinations. |
| NABMGV | The mean of duplicate/several determinations. |
| NAV8NM | The mean of duplicate/several determinations. |
| P6ZRGR | The mean of duplicate/several determinations. |
| PJKACG | The mean of duplicate/several determinations. |
| PKLP8L | The mean of duplicate/several determinations. |
| Q3K2GL | The mean of duplicate/several determinations. |
| Q9RHXM | The mean of duplicate/several determinations. |
| QD9QLM | Triplicate results are averaged. |
| QK6RFL | The mean of duplicate/several determinations. |
| QY4M2T | The mean of duplicate/several determinations. |

# TABLE 2

| WebCode | Reporting Procedures |
|---|---|
| R8GV3U | The mean of duplicate/several determinations. |
| RJ63VP | The mean of duplicate/several determinations. |
| RVNFDT | The lowest value of duplicate/several determinations. |
| TAYFMP | The lowest value of duplicate/several determinations. |
| TEBNMT | The mean of duplicate/several determinations. |
| TG2M2R | The mean of duplicate/several determinations. |
| UUFE2H | The mean of duplicate/several determinations. |
| VCZ6ZH | The mean of duplicate/several determinations. |
| VJGV7A | The mean of five integrated peaks for Item 1; the mean for three integrated peaks for Item 2; the mean for both is truncated. |
| VMG82A | the mean of 3 integrated NMR signals, then truncated |
| VQZ7DJ | The mean of duplicate/several determinations. |
| W9BBFL | The mean of duplicate/several determinations. |
| WN432M | The mean of duplicate/several determinations. |
| WT2D9F | The mean of duplicate/several determinations. |
| WWW87G | The mean of duplicate/several determinations. |
| XJNUDN | The mean of duplicate/several determinations. |
| YRXJQL | The mean of duplicate/several determinations. |
| Z3CZUD | The mean of duplicate/several determinations. |
| Z64Y9B | The mean of duplicate/several determinations. |
| Z9F7AF | The mean of duplicate/several determinations. |
| ZCJXHG | The mean of duplicate/several determinations. |
| ZGUTHJ | The mean of duplicate/several determinations. |
| ZL8TFB | The mean of duplicate/several determinations. |
| ZPM24B | The mean of duplicate/several determinations. |
| ZQYVMG | The mean of duplicate/several determinations. |

# TABLE 2

| WebCode | Reporting Procedures |
|---|---|
| ZUY7JG | The mean of duplicate/several determinations. |

## Response Summary

Participants: **103**

| | | |
|---|---|---|
| The mean of duplicate/several determinations: | 93 | (90.3%) |
| The lowest value of duplicate/several determinations: | 4 | (3.9%) |
| Other: | 6 | (5.8%) |
| No Reporting Procedure Provided: | 0 | (0.0%) |

# Raw Data & Statistical Analysis

*List of raw data determinations in percent.*

TABLE 3 - Item 1

| WebCode | Preparation Concentration : 91% | | | | | | | | Mean | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2B2BGD | 90.10 | 89.50 | | | | | | | 89.80 | |
| 2JW7JH | 91.43 | 91.19 | | | | | | | 91.31 | |
| 3ZH3AB | 93.00 | 93.00 | 93.70 | | | | | | 93.23 | |
| 4A3TA9 | 86.58 | 85.67 | | | | | | | 86.13 | |
| 4EDUEC | 92.21 | 91.57 | | | | | | | 91.89 | |
| 4V3ZQC | 91.00 | 90.60 | | | | | | | 90.80 | |
| 6GX7QM | 91.75 | 89.76 | | | | | | | 90.76 | |
| 6WD8MD | 89.80 | 91.00 | | | | | | | 90.40 | |
| 7ACHM6 | 77.00 | 78.90 | 77.80 | | | | | | 77.90 | X |
| 7CKNA7 | 92.00 | 91.60 | 92.23 | 92.31 | 92.05 | 91.57 | 92.08 | 92.03 | 91.98 | |
| 7GDKZH | 92.09 | 92.78 | 92.14 | 92.79 | 92.40 | 92.23 | | | 92.41 | |
| 7JGP36 | 72.20 | 71.50 | | | | | | | 71.85 | X |
| 7M362D | 91.00 | 90.00 | | | | | | | 90.50 | |
| 88JY74 | 94.14 | 96.42 | 96.28 | | | | | | 95.61 | |
| 8ENXHE | 91.99 | 93.37 | 92.31 | 92.66 | 92.49 | 92.63 | | | 92.58 | |
| 8JDFU6 | 90.98 | 90.96 | 91.03 | 90.57 | 90.89 | 91.08 | 90.81 | 90.95 | 90.91 | |
| 8L4E94 | 93.68 | 92.25 | | | | | | | 92.97 | |
| 8P4P64 | 89.19 | 91.04 | | | | | | | 90.12 | |
| 96DVWE | 89.41 | 92.73 | 93.34 | 92.91 | 93.30 | 93.43 | | | 92.52 | |
| 9E2RU9 | 89.56 | 90.37 | 89.09 | | | | | | 89.67 | |
| 9R6ZQ6 | 91.66 | 91.77 | | | | | | | 91.72 | |
| 9ZFCQA | 92.17 | 93.10 | | | | | | | 92.64 | |
| AJDUKB | 90.90 | 90.54 | | | | | | | 90.72 | |
| BLUJF8 | 87.58 | 90.81 | | | | | | | 89.20 | |
| BNFKX2 | 90.81 | 90.55 | 91.37 | 91.39 | | | | | 91.03 | |
| BUHJM6 | 91.52 | 91.16 | 91.82 | 91.85 | | | | | 91.59 | |

# TABLE 3 - Item 1

| WebCode | Preparation Concentration : 91% | | | | | | | | Mean |
|---|---|---|---|---|---|---|---|---|---|
| C88NLT | 94.30 | 93.80 | 94.00 | 92.10 | 92.40 | 92.20 | | | 93.13 |
| CGCVZT | 88.45 | | | | | | | | 88.45 |
| CVEAF6 | 92.29 | 91.87 | | | | | | | 92.08 |
| CYEKB6 | 91.48 | 91.39 | | | | | | | 91.44 |
| D3V6VY | 88.62 | 88.14 | 88.31 | 88.61 | 90.39 | 91.02 | 91.09 | 91.68 | 89.73 |
| D7W9P8 | 90.84 | 91.06 | | | | | | | 90.95 |
| E6U3JW | 98.37 | 96.89 | 96.42 | | | | | | 97.23 |
| ED9PT2 | 90.56 | 90.55 | | | | | | | 90.56 |
| EFGYP6 | 87.90 | 88.40 | | | | | | | 88.15 |
| EHJV98 | 91.64 | 91.61 | 93.78 | 92.16 | 91.72 | 92.48 | | | 92.23 |
| EV2WFX | 91.19 | 91.52 | | | | | | | 91.36 |
| EZZ499 | 88.72 | 88.94 | | | | | | | 88.83 |
| FDHD7X | 89.26 | 91.26 | | | | | | | 90.26 |
| FNYXQU | 96.49 | 93.34 | 94.73 | | | | | | 94.85 |
| GC7Z22 | 90.60 | 91.20 | | | | | | | 90.90 |
| GGX4A8 | 90.95 | 92.09 | 92.07 | 93.07 | 92.05 | 93.51 | | | 92.29 |
| GNGBRC | 92.47 | 90.91 | | | | | | | 91.69 |
| H4KA8T | 93.39 | 92.14 | 94.32 | 90.88 | | | | | 92.68 |
| H8PTD2 | 90.90 | 90.40 | | | | | | | 90.65 |
| HWTPCT | 90.69 | 90.76 | | | | | | | 90.73 |
| HYXDT4 | 88.90 | | | | | | | | 88.90 |
| J3EXDX | 90.00 | 90.00 | | | | | | | 90.00 |
| JDRGBZ | 90.95 | 91.40 | | | | | | | 91.18 |
| JKN4ET | 92.22 | 92.32 | 90.49 | 88.73 | 88.81 | 85.74 | | | 89.72 |
| K4GEPY | 89.46 | 90.17 | | | | | | | 89.82 |
| K8XT6T | 87.53 | 88.82 | 89.10 | 89.27 | | | | | 88.68 |
| K8ZEZ9 | 91.82 | 91.11 | | | | | | | 91.47 |
| K9C9MZ | 88.20 | 87.43 | 89.64 | 89.05 | | | | | 88.58 |

# TABLE 3 - Item 1

| WebCode | Preparation Concentration : 91% | | | | | | | | Mean |
|---|---|---|---|---|---|---|---|---|---|
| KHZ6JU | 72.58 | 72.59 | | | | | | | 72.59 X |
| KMR9DY | 90.44 | 90.04 | 90.15 | | | | | | 90.21 |
| KQGG23 | 92.11 | 89.76 | 90.48 | 89.27 | 90.77 | 91.26 | | | 90.61 |
| KXATWV | 89.80 | | | | | | | | 89.80 |
| KYKVJU | 89.50 | 89.80 | | | | | | | 89.65 |
| L3W62Q | 89.52 | 89.71 | 88.75 | 88.91 | | | | | 89.22 |
| L3ZPW7 | 85.90 | 89.20 | 96.50 | | | | | | 90.53 |
| L8UJWT | 91.46 | 90.65 | | | | | | | 91.06 |
| M3HVWW | 92.40 | 92.50 | 90.00 | 89.90 | | | | | 91.20 |
| M8UYMY | [No raw data reported.] | | | | | | | | |
| MTUZY2 | 86.59 | 93.24 | 96.43 | 93.89 | 94.58 | 93.98 | | | 93.12 |
| N3FF6G | 89.66 | 89.59 | 89.43 | 89.08 | 89.31 | | | | 89.42 |
| N89KWZ | 92.61 | 92.27 | 91.83 | 92.69 | 92.69 | 91.29 | | | 92.23 |
| NABMGV | 90.20 | 90.20 | | | | | | | 90.20 |
| NAV8NM | 90.28 | 90.30 | | | | | | | 90.29 |
| P6ZRGR | 71.30 | 74.70 | | | | | | | 73.00 X |
| PJKACG | 88.56 | | | | | | | | 88.56 |
| PKLP8L | 90.03 | 87.81 | 90.26 | 84.76 | 86.00 | 84.89 | | | 87.29 |
| Q3K2GL | 89.98 | 90.24 | 89.78 | 90.55 | | | | | 90.14 |
| Q9RHXM | 92.82 | 92.34 | | | | | | | 92.58 |
| QD9QLM | 91.14 | 90.89 | 90.68 | 90.92 | 91.75 | 91.13 | 91.38 | 91.16 | 91.13 |
| QK6RFL | 89.96 | 90.35 | | | | | | | 90.16 |
| QY4M2T | 90.05 | 90.35 | | | | | | | 90.20 |
| R8GV3U | 91.18 | 90.61 | 91.11 | 92.07 | 90.67 | 91.60 | | | 91.21 |
| RJ63VP | 90.63 | 89.78 | | | | | | | 90.21 |
| RVNFDT | 91.40 | 90.80 | 90.80 | 90.60 | 90.10 | 89.90 | | | 90.60 |
| TAYFMP | 91.00 | 90.00 | | | | | | | 90.50 |
| TEBNMT | 90.11 | 90.40 | | | | | | | 90.26 |

# TABLE 3 - Item 1

| WebCode | Preparation Concentration : 91% | | | | | | | | Mean |
|---|---|---|---|---|---|---|---|---|---|
| TG2M2R | 90.28 | 90.61 | 91.14 | | | | | | 90.68 |
| UUFE2H | 90.17 | 90.26 | 90.08 | 90.03 | 91.07 | 90.41 | 90.92 | 90.47 | 90.43 |
| VCZ6ZH | 92.10 | 91.92 | 91.07 | 90.67 | | | | | 91.44 |
| VJGV7A | 91.99 | 91.92 | 91.80 | 91.36 | 91.48 | | | | 91.71 |
| VMG82A | 90.30 | 89.67 | 89.99 | | | | | | 89.98 |
| VQZ7DJ | 90.75 | 90.70 | | | | | | | 90.73 |
| W9BBFL | 92.04 | 90.66 | | | | | | | 91.35 |
| WN432M | 89.80 | 90.62 | | | | | | | 90.21 |
| WT2D9F | 92.56 | 89.35 | 89.10 | | | | | | 90.34 |
| WWW87G | 91.79 | 92.67 | | | | | | | 92.23 |
| XJNUDN | 92.92 | 92.72 | 92.81 | | | | | | 92.82 |
| YRXJQL | 91.54 | 92.07 | 91.42 | | | | | | 91.68 |
| Z3CZUD | 90.05 | 90.18 | 90.26 | 90.37 | 90.38 | 90.39 | 90.63 | 90.71 | 90.37 |
| Z64Y9B | 92.02 | 91.06 | | | | | | | 91.54 |
| Z9F7AF | 89.70 | 90.00 | | | | | | | 89.85 |
| ZCJXHG | 90.14 | 91.01 | | | | | | | 90.58 |
| ZGUTHJ | 92.10 | 92.60 | | | | | | | 92.35 |
| ZL8TFB | 95.52 | 91.40 | 94.07 | | | | | | 93.66 |
| ZPM24B | 91.20 | 90.70 | 91.50 | 91.50 | | | | | 91.23 |
| ZQYVMG | 93.13 | 91.48 | 92.54 | 91.14 | | | | | 92.07 |
| ZUY7JG | 94.49 | 94.96 | 93.81 | 95.00 | | | | | 94.57 |

| Statistical Analysis for Item 1 | | | Participants: **103** |
|---|---|---|---|
| Preparation Concentration: | 91% | Number of Participants Included: | 98 |
| Grand Mean: | 90.99 | Number of Participants Excluded: | 4 |
| Standard Deviation: | 1.634 | Number of Participants without Raw Data: | 1 |

# TABLE 3 - Item 2

| WebCode | Preparation Concentration : 74% | | | | | | | | Mean | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2B2BGD | 73.80 | 74.80 | | | | | | | 74.30 | |
| 2JW7JH | 72.15 | 71.82 | | | | | | | 71.99 | |
| 3ZH3AB | 75.90 | 75.60 | 75.60 | | | | | | 75.70 | |
| 4A3TA9 | 69.01 | 59.75 | | | | | | | 64.38 | |
| 4EDUEC | 75.39 | 74.03 | | | | | | | 74.71 | |
| 4V3ZQC | 75.10 | 74.10 | | | | | | | 74.60 | |
| 6GX7QM | 73.39 | 73.53 | | | | | | | 73.46 | |
| 6WD8MD | 74.70 | 74.80 | | | | | | | 74.75 | |
| 7ACHM6 | 60.20 | 62.70 | 58.60 | | | | | | 60.50 | X |
| 7CKNA7 | 74.35 | 74.32 | 74.21 | 74.44 | 72.99 | 73.10 | 72.87 | 73.09 | 73.67 | |
| 7GDKZH | 72.67 | 74.21 | 75.60 | 74.01 | 74.72 | 73.68 | | | 74.15 | |
| 7JGP36 | 48.20 | 51.50 | | | | | | | 49.85 | X |
| 7M362D | 70.70 | 73.80 | | | | | | | 72.25 | |
| 88JY74 | 77.64 | 77.38 | 76.28 | | | | | | 77.10 | |
| 8ENXHE | 75.13 | 74.97 | 74.76 | 74.14 | 74.19 | 74.56 | | | 74.63 | |
| 8JDFU6 | 72.45 | 72.60 | 72.68 | 72.55 | 72.54 | 72.88 | 72.65 | 72.77 | 72.64 | |
| 8L4E94 | 77.75 | 76.74 | | | | | | | 77.25 | |
| 8P4P64 | 72.73 | 72.04 | | | | | | | 72.39 | |
| 96DVWE | 75.32 | 75.60 | 75.24 | 75.48 | 75.51 | 75.22 | | | 75.40 | |
| 9E2RU9 | 72.68 | 73.76 | 73.91 | | | | | | 73.45 | |
| 9R6ZQ6 | 74.50 | 74.30 | | | | | | | 74.40 | |
| 9ZFCQA | 76.32 | 75.01 | | | | | | | 75.66 | |
| AJDUKB | 71.68 | 72.53 | | | | | | | 72.11 | |
| BLUJF8 | 76.22 | 74.37 | | | | | | | 75.30 | |
| BNFKX2 | 75.68 | 75.28 | 74.18 | 73.85 | | | | | 74.75 | |
| BUHJM6 | 74.98 | 74.77 | 74.35 | 74.26 | | | | | 74.59 | |
| C88NLT | 75.80 | 75.70 | 75.70 | 74.30 | 74.50 | 74.20 | | | 75.03 | |
| CGCVZT | 71.57 | | | | | | | | 71.57 | |

# TABLE 3 - Item 2

| WebCode | Preparation Concentration : 74% | | | | | | | | Mean |
|---|---|---|---|---|---|---|---|---|---|
| CVEAF6 | 73.85 | 72.41 | | | | | | | 73.13 |
| CYEKB6 | 76.95 | 75.60 | | | | | | | 76.28 |
| D3V6VY | 71.73 | 72.32 | 72.35 | 72.47 | 72.60 | 72.62 | 72.74 | 72.77 | 72.45 |
| D7W9P8 | 71.84 | 70.36 | | | | | | | 71.10 |
| E6U3JW | 78.48 | 79.66 | 78.94 | | | | | | 79.03 |
| ED9PT2 | 72.91 | 73.58 | | | | | | | 73.25 |
| EFGYP6 | 71.50 | 70.50 | | | | | | | 71.00 |
| EHJV98 | 72.86 | 74.28 | 77.48 | 75.35 | 76.10 | 76.05 | | | 75.35 |
| EV2WFX | 74.67 | 74.92 | | | | | | | 74.80 |
| EZZ499 | 72.39 | 72.66 | | | | | | | 72.53 |
| FDHD7X | 74.87 | 72.87 | | | | | | | 73.87 |
| FNYXQU | 76.35 | 79.58 | 77.11 | | | | | | 77.68 |
| GC7Z22 | 73.40 | 72.60 | | | | | | | 73.00 |
| GGX4A8 | 74.88 | 73.79 | 74.38 | 74.79 | 74.95 | 74.83 | | | 74.60 |
| GNGBRC | 74.92 | 73.19 | | | | | | | 74.06 |
| H4KA8T | 76.04 | 75.59 | 76.02 | 75.19 | | | | | 75.71 |
| H8PTD2 | 74.40 | 67.10 | | | | | | | 70.75 |
| HWTPCT | 78.21 | 76.97 | | | | | | | 77.59 |
| HYXDT4 | 72.90 | | | | | | | | 72.90 |
| J3EXDX | 74.00 | 71.00 | | | | | | | 72.50 |
| JDRGBZ | 74.73 | 73.96 | | | | | | | 74.35 |
| JKN4ET | 74.56 | 72.73 | 72.87 | 71.36 | 69.89 | 74.50 | | | 72.65 |
| K4GEPY | 72.73 | 73.21 | | | | | | | 72.97 |
| K8XT6T | 72.95 | 73.15 | 73.29 | 72.94 | | | | | 73.08 |
| K8ZEZ9 | 74.07 | 73.74 | | | | | | | 73.91 |
| K9C9MZ | 76.41 | 76.31 | 75.41 | 75.43 | | | | | 75.89 |
| KHZ6JU | 57.79 | 58.13 | | | | | | | 57.96 X |
| KMR9DY | 72.79 | 72.86 | 73.01 | | | | | | 72.89 |

# TABLE 3 - Item 2

| WebCode | Preparation Concentration : 74% | | | | | | | | Mean |
|---|---|---|---|---|---|---|---|---|---|
| KQGG23 | 75.15 | 73.07 | 74.73 | 75.51 | 71.96 | 74.01 | | | 74.07 |
| KXATWV | 73.50 | | | | | | | | 73.50 |
| KYKVJU | 75.10 | 74.80 | | | | | | | 74.95 |
| L3W62Q | 73.17 | 73.44 | 72.56 | 72.57 | | | | | 72.94 |
| L3ZPW7 | 76.20 | 66.70 | 73.80 | | | | | | 72.23 |
| L8UJWT | 74.80 | 75.26 | | | | | | | 75.03 |
| M3HVWW | 75.20 | 75.10 | 75.20 | 75.30 | | | | | 75.20 |
| M8UYMY | [No raw data reported.] | | | | | | | | |
| MTUZY2 | 77.38 | 75.56 | 74.05 | 79.37 | 77.78 | 74.93 | | | 76.51 |
| N3FF6G | 73.37 | 73.73 | 72.97 | 73.21 | | | | | 73.32 |
| N89KWZ | 75.44 | 74.55 | 75.49 | 75.21 | 75.71 | 75.13 | | | 75.26 |
| NABMGV | 73.50 | 72.70 | | | | | | | 73.10 |
| NAV8NM | 74.95 | 73.48 | | | | | | | 74.22 |
| P6ZRGR | 58.00 | 58.60 | | | | | | | 58.30 X |
| PJKACG | 71.55 | | | | | | | | 71.55 |
| PKLP8L | 73.66 | 73.70 | 72.61 | 72.02 | 70.59 | 69.96 | | | 72.09 |
| Q3K2GL | 73.55 | 74.26 | 74.41 | 73.38 | | | | | 73.90 |
| Q9RHXM | 75.46 | 74.23 | | | | | | | 74.85 |
| QD9QLM | 73.36 | 73.12 | 73.44 | 73.38 | 73.14 | 73.43 | 73.19 | 73.28 | 73.29 |
| QK6RFL | 71.98 | 72.23 | | | | | | | 72.11 |
| QY4M2T | 71.60 | 72.77 | | | | | | | 72.19 |
| R8GV3U | 74.63 | 73.76 | 74.34 | 74.24 | 74.46 | 74.53 | | | 74.33 |
| RJ63VP | 73.75 | 74.61 | | | | | | | 74.18 |
| RVNFDT | 73.40 | 73.10 | 73.40 | 74.30 | 74.10 | 74.10 | | | 73.73 |
| TAYFMP | 73.00 | 72.00 | | | | | | | 72.50 |
| TEBNMT | 74.09 | 73.87 | | | | | | | 73.98 |
| TG2M2R | 72.00 | 71.81 | 71.51 | | | | | | 71.77 |
| UUFE2H | 72.34 | 72.28 | 71.99 | 72.19 | 70.13 | 70.28 | 70.25 | 70.45 | 71.24 |

# TABLE 3 - Item 2

| WebCode | Preparation Concentration : 74% | | | | | | | | Mean |
|---|---|---|---|---|---|---|---|---|---|
| VCZ6ZH | 73.95 | 73.95 | 74.92 | 74.69 | | | | | 74.38 |
| VJGV7A | 74.58 | 74.43 | 74.51 | | | | | | 74.51 |
| VMG82A | 71.55 | 70.69 | 71.24 | | | | | | 71.16 |
| VQZ7DJ | 73.81 | 71.26 | | | | | | | 72.54 |
| W9BBFL | 73.82 | 72.40 | | | | | | | 73.11 |
| WN432M | 71.76 | 71.37 | | | | | | | 71.57 |
| WT2D9F | 73.47 | 74.15 | 73.87 | | | | | | 73.83 |
| WWW87G | 74.04 | 74.04 | | | | | | | 74.04 |
| XJNUDN | 76.46 | 76.60 | 76.65 | | | | | | 76.57 |
| YRXJQL | 74.15 | 75.35 | 73.12 | | | | | | 74.21 |
| Z3CZUD | 71.53 | 71.86 | 71.89 | 72.05 | 72.68 | 73.16 | 73.20 | 73.27 | 72.46 |
| Z64Y9B | 73.95 | 73.55 | | | | | | | 73.75 |
| Z9F7AF | 73.60 | 73.70 | | | | | | | 73.65 |
| ZCJXHG | 72.36 | 72.47 | | | | | | | 72.42 |
| ZGUTHJ | 72.60 | 73.80 | | | | | | | 73.20 |
| ZL8TFB | 74.84 | 79.16 | 78.30 | | | | | | 77.43 |
| ZPM24B | 76.70 | 74.30 | 75.90 | 74.80 | | | | | 75.43 |
| ZQYVMG | 75.01 | 74.51 | 74.63 | 73.90 | | | | | 74.51 |
| ZUY7JG | 75.72 | 76.87 | 74.04 | 73.39 | | | | | 75.01 |

| Statistical Analysis for Item 2 | | | Participants: **103** |
|---|---|---|---|
| Preparation Concentration: | 74% | Number of Participants Included: | 98 |
| Grand Mean: | 73.81 | Number of Participants Excluded: | 4 |
| Standard Deviation: | 1.896 | Number of Participants without Raw Data: | 1 |

TABLE 3 - Response Summary

| Response Summary | Item 1 | Item 2 |
|---|---|---|
| **Preparation Concentration** | **91%** | **74%** |
| Grand Mean | 90.99 | 73.81 |
| Standard Deviation | 1.634 | 1.896 |

# Method of Analysis

TABLE 4

| WebCode | GC | GC/MS | GC/FID | LC | LC/MS | NMR | Other |
|---|---|---|---|---|---|---|---|
| 2B2BGD | | | | | | | qNMR 400 MHz |
| 2JW7JH | | | ✓ | | | | |
| 3ZH3AB | | | | | ✓ | | |
| 4A3TA9 | | | | | ✓ | | |
| 4EDUEC | | | | | | ✓ | |
| 4V3ZQC | | ✓ | | ✓ | | | UPLC |
| 6GX7QM | | | ✓ | | | | |
| 6WD8MD | | | | | | ✓ | |
| 7ACHM6 | | | | | | ✓ | |
| 7CKNA7 | | | ✓ | | | | |
| 7GDKZH | ✓ | | ✓ | | | | |
| 7JGP36 | | ✓ | | | | | |
| 7M362D | | | | | | ✓ | |
| 88JY74 | | ✓ | | | | | |
| 8ENXHE | | | ✓ | | | | Weight Measurement |
| 8JDFU6 | | | ✓ | | | | |
| 8L4E94 | | | | | | | LC/QQQ |
| 8P4P64 | | | ✓ | | | | |
| 96DVWE | | | ✓ | | | | |
| 9E2RU9 | | | | | | | HPLC |
| 9R6ZQ6 | | ✓ | | | | | |
| 9ZFCQA | | | ✓ | | | | |
| AJDUKB | | | ✓ | | | | |
| BLUJF8 | | | | ✓ | | | |
| BNFKX2 | | | | | | ✓ | |
| BUHJM6 | | | | | | ✓ | |
| C88NLT | | | ✓ | | | | |
| CGCVZT | | ✓ | | | | | |
| CVEAF6 | | | | | | | 1H-NMR |
| CYEKB6 | | | | | | ✓ | |
| D3V6VY | | | ✓ | | | | |
| D7W9P8 | | | ✓ | | | | |

TABLE 4

| WebCode | GC | GC/MS | GC/FID | LC | LC/MS | NMR | Other |
|---|---|---|---|---|---|---|---|
| E6U3JW | | ✓ | | | | | |
| ED9PT2 | | | | | | ✓ | |
| EFGYP6 | | | | ✓ | | | |
| EHJV98 | | | ✓ | | | | |
| EV2WFX | | ✓ | ✓ | | | | |
| EZZ499 | | | | | | ✓ | |
| FDHD7X | | | | | | ✓ | |
| FNYXQU | | ✓ | | | | | |
| GC7Z22 | | | ✓ | | | | |
| GGX4A8 | ✓ | | | | | | |
| GNGBRC | | | ✓ | | | | |
| H4KA8T | | | ✓ | | | | |
| H8PTD2 | | | | | | ✓ | |
| HWTPCT | | ✓ | | | | | |
| HYXDT4 | | | ✓ | | | | |
| J3EXDX | | | ✓ | | | | |
| JDRGBZ | | | ✓ | | | | |
| JKN4ET | | | | ✓ | | | |
| K4GEPY | | | ✓ | | | | |
| K8XT6T | | | ✓ | | | | |
| K8ZEZ9 | | | ✓ | | | | |
| K9C9MZ | ✓ | | | | | | |
| KHZ6JU | | | | | | | LC/UV/MS |
| KMR9DY | | | | | | | HPLC |
| KQGG23 | | | ✓ | | | | |
| KXATWV | | | | | | | LC/UV/MS |
| KYKVJU | | | | | | ✓ | |
| L3W62Q | | | ✓ | | | | |
| L3ZPW7 | | ✓ | | | | | |
| L8UJWT | | | | | | ✓ | |
| M3HVWW | | | | ✓ | | | |
| M8UYMY | | | ✓ | | | | |
| MTUZY2 | | | ✓ | | | | |

TABLE 4

| WebCode | GC | GC/MS | GC/FID | LC | LC/MS | NMR | Other |
|---|---|---|---|---|---|---|---|
| N3FF6G | | | | | | ✓ | |
| N89KWZ | | | ✓ | | | | |
| NABMGV | | | | | | ✓ | |
| NAV8NM | | | ✓ | | | | |
| P6ZRGR | | | | ✓ | | | |
| PJKACG | | ✓ | | | | | |
| PKLP8L | | | | ✓ | | | |
| Q3K2GL | | | ✓ | | | | |
| Q9RHXM | | | | | | ✓ | |
| QD9QLM | | | ✓ | | | | |
| QK6RFL | | | ✓ | | | | |
| QY4M2T | | | ✓ | | | | |
| R8GV3U | | | ✓ | | | | |
| RJ63VP | | | | | | ✓ | |
| RVNFDT | | | ✓ | | | | |
| TAYFMP | | | ✓ | | | | |
| TEBNMT | | | | | | ✓ | |
| TG2M2R | | | ✓ | | | | |
| UUFE2H | | | ✓ | | | | |
| VCZ6ZH | | | | | | ✓ | |
| VJGV7A | | | | | | ✓ | |
| VMG82A | | | | | | ✓ | |
| VQZ7DJ | | | | | | ✓ | |
| W9BBFL | | | | ✓ | | | |
| WN432M | | | ✓ | | | | |
| WT2D9F | | | ✓ | | | | |
| WWW87G | | | | | ✓ | | |
| XJNUDN | | | ✓ | | | | |
| YRXJQL | | | | ✓ | | | |
| Z3CZUD | | | ✓ | | | | |
| Z64Y9B | | | ✓ | | | | |
| Z9F7AF | | | | | | ✓ | |
| ZCJXHG | | | | | | ✓ | |

TABLE 4

| WebCode | GC | GC/MS | GC/FID | LC | LC/MS | NMR | Other |
|---|---|---|---|---|---|---|---|
| ZGUTHJ | | | | | | ✓ | |
| ZL8TFB | | ✓ | | | | | |
| ZPM24B | | | ✓ | | | | |
| ZQYVMG | ✓ | | | | | | |
| ZUY7JG | ✓ | | | | | | |

**Response Summary** Participants: **103**

| Method: | GC | GC/MS | GC/FID | LC | LC/MS | NMR |
|---|---|---|---|---|---|---|
| Participants: | 5 | 12 | 45 | 9 | 3 | 25 |
| Percent: | 4.9% | 11.7% | 43.7% | 8.7% | 2.9% | 24.3% |

# Additional Comments

TABLE 5

| WebCode | Additional Comments |
|---|---|
| 7CKNA7 | 12 injections made up the average. The lowest two and highest two values for each item were excluded from question 2 above. |
| 8JDFU6 | 12 injections made up the average. The lowest two and highest two values for each item were excluded from question 2 above. |
| 9ZFCQA | Both Item 1 and Item 2 both contained caffeine. |
| BLUJF8 | Caffeine detected. |
| C88NLT | Our SOP says we have to run two aliquots (A & B) in triplicate, average the results for each (A & B), report the lowest result truncated. Our uncertainty is 9% of the value (e.g. quant result x 0.09) = uncertainty. |
| D3V6VY | 12 injections made up the average. The lowest two and highest two values for each item were excluded from question 2 above. |
| HWTPCT | Calculations were completed for the Methamphetamine HCl conversion per PT instructions. |
| JKN4ET | Caffeine detected in both items. |
| L3ZPW7 | Uncertainty not available at this time since the method is not fully validated yet. |
| N3FF6G | CAFFEINE PRESENT IN BOTH SAMPLES |
| PKLP8L | Caffeine detected in both items. |
| QD9QLM | 12 injections made up the average. The lowest two and highest two values for each item were excluded from question 2 above |
| RVNFDT | The lowest value is truncated at the decimal point and reported. |
| UUFE2H | 12 injections made up the average. The lowest two and highest two values for each item were excluded from question 2 above. |
| VJGV7A | For both items, d-methamphetamine was identified, and caffeine was also present. |
| VMG82A | items 1 and 2: 3 out of 6 possible NMR integral values were used to determine the purity. Caffeine was also detected in each item. |
| Z3CZUD | 12 injections made up the average. The lowest two and highest two values for each item were excluded from question 2 above. |
| ZCJXHG | Items 1 and 2 contain caffeine. |

# Supplemental: Hotelling T-Squared Bivariate Control Analysis

Hotelling T-Squared Bivariate Control Analysis is used in many other industries to examine results. Although not typically used in forensic science, CTS is presenting an introduction to this type of statistical data analysis. A laboratory may choose to delve deeper in a participant's results by studying both sets of statistics available in this report. The statistics presented in Table 3 (Raw Data) of this report examine the results of each item independently of each other. However, because the same materials are chosen for both samples, there should be a correlation of measurement performance between the two samples. A bivariate analysis technique judges measurement performance on both samples simultaneously, represented as an ellipse. For each participant, the mean of Item 1 (x-axis) is plotted against the mean of Item 2 (y-axis). The horizontal and vertical cross-hairs are the grand means for each Item. When 20 or more participants are included in the statistics, an ellipse is drawn so that 99% of the time a randomly selected participant will be included inside.

When considering your participant's position on the plot relative to the ellipse, remember that, generally speaking, if a participant's plotted point falls on the major axis outside of the ellipse, the participant is consistent in its measurements between the two samples but exhibits an offset from the grand mean (systematic difference). If a plotted point falls to the side of the ellipse, it indicates possible differences in the way that the participant tested the two samples or differences in sample behavior (consistency difference). The two-sample plot enables you to see which sample, if either, is "extreme" and to ascertain the nature of the "extreme" data.

### Systematic Difference

Bias is illustrated in the control ellipse on the two sample plot. If a particular analysis/sample combination did not show bias, the control ellipse would become a circle. Differences in procedures, conditions, instrumentation and sample preparation all contribute to the bias of a participant. When these differences become too large, a participant may receive a Data Flag. When the test results for both samples are both high or low compared to the group, a participant has a fixed set of factors on which to focus to identify a cause. Furthermore, since additional testing on similar samples should produce similar high or low results, it is possible to determine that a systematic error has been successfully corrected.

### Consistency Difference

The participant's results indicate that there are differences in the way the two samples were tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the Comparative Performance Values (CPV) for the two samples, such as a +1.5 CPV for Item 1 and a -2.2 CPV for Item 2. CPV is the number of standard deviations a value is from the grand mean.

### Key for Data Flags

| Data Flag | Statistically Included/Excluded | Explanation |
|---|---|---|
| * | Included | Results fall outside 99% ellipse, but within a 99.5% control limit (ellipse) that is calculated. |
| X | Excluded | Results fall outside of 99.5% control limit. |
| M | Excluded | Data is missing for at least one item |

# Bivariate Control Analysis

| | | Item 1 | | | Item 2 | | |
|---|---|---|---|---|---|---|---|
| WebCode | Data Flag | Participant Mean | Difference from Grand Mean | CPV | Participant Mean | Difference from Grand Mean | CPV |
| 2B2BGD | | 89.80 | -1.191 | -0.73 | 74.30 | 0.491 | 0.26 |
| 2JW7JH | | 91.31 | 0.319 | 0.20 | 71.99 | -1.824 | -0.96 |
| 3ZH3AB | | 93.23 | 2.242 | 1.37 | 75.70 | 1.891 | 1.00 |
| 4A3TA9 | * | 86.13 | -4.865 | -2.98 | 64.38 | -9.430 | -4.97 |
| 4EDUEC | | 91.89 | 0.899 | 0.55 | 74.71 | 0.901 | 0.48 |
| 4V3ZQC | | 90.80 | -0.191 | -0.12 | 74.60 | 0.791 | 0.42 |
| 6GX7QM | | 90.76 | -0.236 | -0.14 | 73.46 | -0.349 | -0.18 |
| 6WD8MD | | 90.40 | -0.591 | -0.36 | 74.75 | 0.941 | 0.50 |
| 7ACHM6 | X | 77.90 | -13.091 | -8.01 | 60.50 | -13.309 | -7.02 |
| 7CKNA7 | | 91.98 | 0.993 | 0.61 | 73.67 | -0.137 | -0.07 |
| 7GDKZH | | 92.41 | 1.414 | 0.87 | 74.15 | 0.340 | 0.18 |
| 7JGP36 | X | 71.85 | -19.141 | -11.72 | 49.85 | -23.959 | -12.64 |
| 7M362D | | 90.50 | -0.491 | -0.30 | 72.25 | -1.559 | -0.82 |
| 88JY74 | | 95.61 | 4.622 | 2.83 | 77.10 | 3.291 | 1.74 |
| 8ENXHE | | 92.58 | 1.584 | 0.97 | 74.63 | 0.816 | 0.43 |
| 8JDFU6 | | 90.91 | -0.082 | -0.05 | 72.64 | -1.169 | -0.62 |
| 8L4E94 | | 92.97 | 1.974 | 1.21 | 77.25 | 3.436 | 1.81 |
| 8P4P64 | | 90.12 | -0.876 | -0.54 | 72.39 | -1.424 | -0.75 |
| 96DVWE | | 92.52 | 1.529 | 0.94 | 75.40 | 1.586 | 0.84 |
| 9E2RU9 | | 89.67 | -1.318 | -0.81 | 73.45 | -0.359 | -0.19 |
| 9R6ZQ6 | | 91.72 | 0.724 | 0.44 | 74.40 | 0.591 | 0.31 |
| 9ZFCQA | | 92.64 | 1.644 | 1.01 | 75.66 | 1.856 | 0.98 |
| AJDUKB | | 90.72 | -0.271 | -0.17 | 72.11 | -1.704 | -0.90 |
| BLUJF8 | | 89.20 | -1.796 | -1.10 | 75.30 | 1.486 | 0.78 |
| BNFKX2 | | 91.03 | 0.039 | 0.02 | 74.75 | 0.939 | 0.50 |

| | | Item 1 | | | Item 2 | | |
|---|---|---|---|---|---|---|---|
| WebCode | Data Flag | Participant Mean | Difference from Grand Mean | CPV | Participant Mean | Difference from Grand Mean | CPV |
| BUHJM6 | | 91.59 | 0.596 | 0.37 | 74.59 | 0.781 | 0.41 |
| C88NLT | | 93.13 | 2.142 | 1.31 | 75.03 | 1.225 | 0.65 |
| CGCVZT | | 88.45 | -2.541 | -1.56 | 71.57 | -2.239 | -1.18 |
| CVEAF6 | | 92.08 | 1.089 | 0.67 | 73.13 | -0.679 | -0.36 |
| CYEKB6 | | 91.44 | 0.444 | 0.27 | 76.28 | 2.466 | 1.30 |
| D3V6VY | | 89.73 | -1.259 | -0.77 | 72.45 | -1.359 | -0.72 |
| D7W9P8 | | 90.95 | -0.041 | -0.03 | 71.10 | -2.709 | -1.43 |
| E6U3JW | * | 97.23 | 6.236 | 3.82 | 79.03 | 5.218 | 2.75 |
| ED9PT2 | | 90.56 | -0.436 | -0.27 | 73.25 | -0.564 | -0.30 |
| EFGYP6 | | 88.15 | -2.841 | -1.74 | 71.00 | -2.809 | -1.48 |
| EHJV98 | | 92.23 | 1.241 | 0.76 | 75.35 | 1.545 | 0.81 |
| EV2WFX | | 91.36 | 0.364 | 0.22 | 74.80 | 0.986 | 0.52 |
| EZZ499 | | 88.83 | -2.161 | -1.32 | 72.53 | -1.284 | -0.68 |
| FDHD7X | | 90.26 | -0.731 | -0.45 | 73.87 | 0.061 | 0.03 |
| FNYXQU | | 94.85 | 3.862 | 2.36 | 77.68 | 3.871 | 2.04 |
| GC7Z22 | | 90.90 | -0.091 | -0.06 | 73.00 | -0.809 | -0.43 |
| GGX4A8 | | 92.29 | 1.299 | 0.80 | 74.60 | 0.795 | 0.42 |
| GNGBRC | | 91.69 | 0.699 | 0.43 | 74.06 | 0.246 | 0.13 |
| H4KA8T | | 92.68 | 1.691 | 1.04 | 75.71 | 1.901 | 1.00 |
| H8PTD2 | | 90.65 | -0.341 | -0.21 | 70.75 | -3.059 | -1.61 |
| HWTPCT | | 90.73 | -0.266 | -0.16 | 77.59 | 3.781 | 1.99 |
| HYXDT4 | | 88.90 | -2.091 | -1.28 | 72.90 | -0.909 | -0.48 |
| J3EXDX | | 90.00 | -0.991 | -0.61 | 72.50 | -1.309 | -0.69 |
| JDRGBZ | | 91.18 | 0.184 | 0.11 | 74.35 | 0.536 | 0.28 |
| JKN4ET | | 89.72 | -1.273 | -0.78 | 72.65 | -1.157 | -0.61 |
| K4GEPY | | 89.82 | -1.176 | -0.72 | 72.97 | -0.839 | -0.44 |
| K8XT6T | | 88.68 | -2.311 | -1.41 | 73.08 | -0.726 | -0.38 |

| | | Item 1 | | | Item 2 | | |
|---|---|---|---|---|---|---|---|
| WebCode | Data Flag | Participant Mean | Difference from Grand Mean | CPV | Participant Mean | Difference from Grand Mean | CPV |
| K8ZEZ9 | | 91.47 | 0.474 | 0.29 | 73.91 | 0.096 | 0.05 |
| K9C9MZ | * | 88.58 | -2.411 | -1.48 | 75.89 | 2.081 | 1.10 |
| KHZ6JU | X | 72.59 | -18.406 | -11.27 | 57.96 | -15.849 | -8.36 |
| KMR9DY | | 90.21 | -0.781 | -0.48 | 72.89 | -0.922 | -0.49 |
| KQGG23 | | 90.61 | -0.383 | -0.23 | 74.07 | 0.263 | 0.14 |
| KXATWV | | 89.80 | -1.191 | -0.73 | 73.50 | -0.309 | -0.16 |
| KYKVJU | | 89.65 | -1.341 | -0.82 | 74.95 | 1.141 | 0.60 |
| L3W62Q | | 89.22 | -1.769 | -1.08 | 72.94 | -0.874 | -0.46 |
| L3ZPW7 | | 90.53 | -0.458 | -0.28 | 72.23 | -1.575 | -0.83 |
| L8UJWT | | 91.06 | 0.064 | 0.04 | 75.03 | 1.221 | 0.64 |
| M3HVWW | | 91.20 | 0.209 | 0.13 | 75.20 | 1.391 | 0.73 |
| M8UYMY | M | | | | | | |
| MTUZY2 | | 93.12 | 2.127 | 1.30 | 76.51 | 2.703 | 1.43 |
| N3FF6G | | 89.42 | -1.575 | -0.96 | 73.32 | -0.488 | -0.26 |
| N89KWZ | | 92.23 | 1.239 | 0.76 | 75.26 | 1.446 | 0.76 |
| NABMGV | | 90.20 | -0.791 | -0.48 | 73.10 | -0.709 | -0.37 |
| NAV8NM | | 90.29 | -0.701 | -0.43 | 74.22 | 0.406 | 0.21 |
| P6ZRGR | X | 73.00 | -17.991 | -11.01 | 58.30 | -15.509 | -8.18 |
| PJKACG | | 88.56 | -2.431 | -1.49 | 71.55 | -2.259 | -1.19 |
| PKLP8L | | 87.29 | -3.699 | -2.26 | 72.09 | -1.719 | -0.91 |
| Q3K2GL | | 90.14 | -0.854 | -0.52 | 73.90 | 0.091 | 0.05 |
| Q9RHXM | | 92.58 | 1.589 | 0.97 | 74.85 | 1.036 | 0.55 |
| QD9QLM | | 91.13 | 0.140 | 0.09 | 73.29 | -0.516 | -0.27 |
| QK6RFL | | 90.16 | -0.836 | -0.51 | 72.11 | -1.704 | -0.90 |
| QY4M2T | | 90.20 | -0.791 | -0.48 | 72.19 | -1.624 | -0.86 |
| R8GV3U | | 91.21 | 0.216 | 0.13 | 74.33 | 0.518 | 0.27 |
| RJ63VP | | 90.21 | -0.786 | -0.48 | 74.18 | 0.371 | 0.20 |

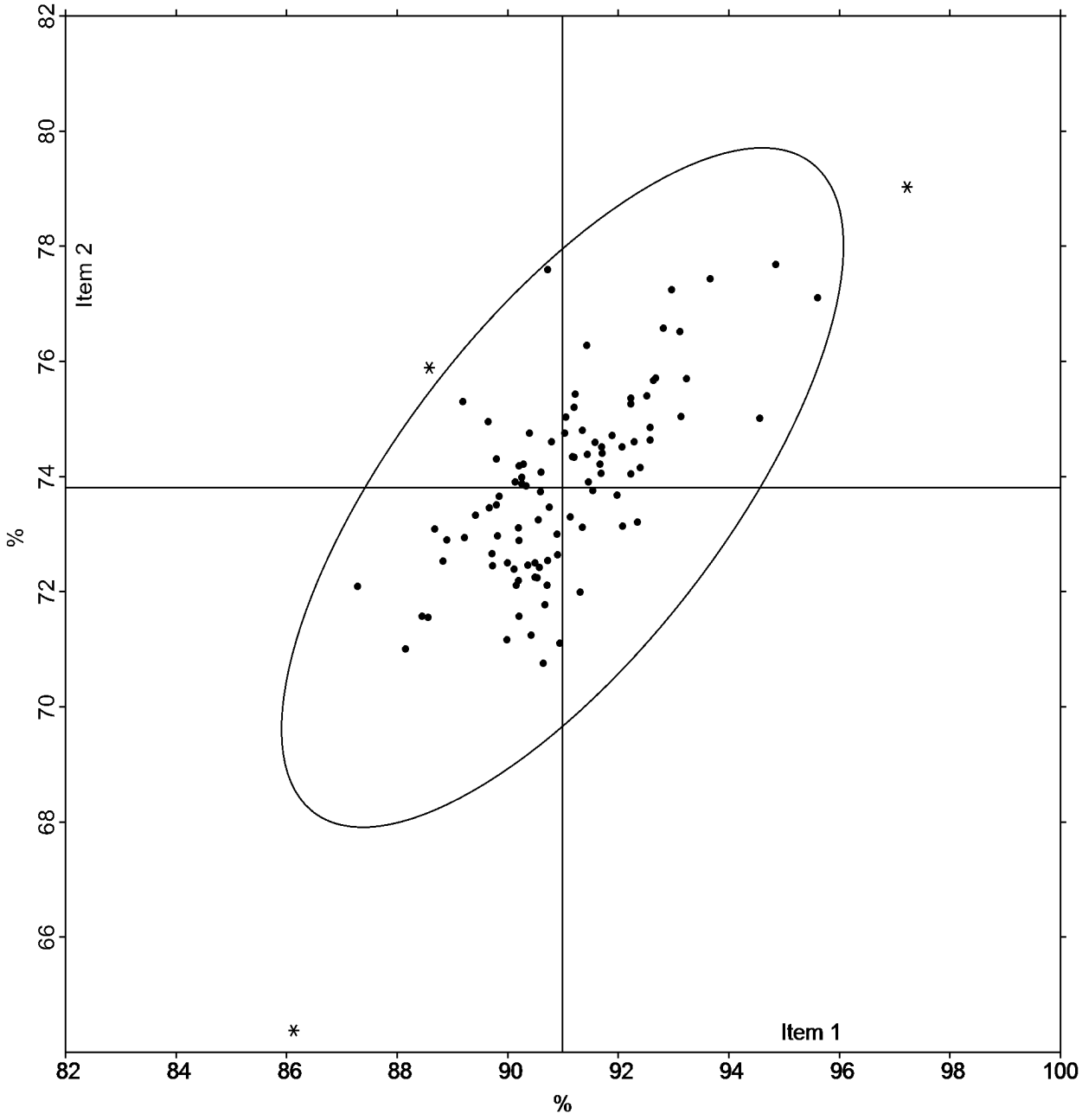
| | | Item 1 | | | Item 2 | | |
|---|---|---|---|---|---|---|---|
| WebCode | Data Flag | Participant Mean | Difference from Grand Mean | CPV | Participant Mean | Difference from Grand Mean | CPV |
| RVNFDT | | 90.60 | -0.391 | -0.24 | 73.73 | -0.075 | -0.04 |
| TAYFMP | | 90.50 | -0.491 | -0.30 | 72.50 | -1.309 | -0.69 |
| TEBNMT | | 90.26 | -0.736 | -0.45 | 73.98 | 0.171 | 0.09 |
| TG2M2R | | 90.68 | -0.311 | -0.19 | 71.77 | -2.035 | -1.07 |
| UUFE2H | | 90.43 | -0.565 | -0.35 | 71.24 | -2.570 | -1.36 |
| VCZ6ZH | | 91.44 | 0.449 | 0.27 | 74.38 | 0.569 | 0.30 |
| VJGV7A | | 91.71 | 0.716 | 0.44 | 74.51 | 0.698 | 0.37 |
| VMG82A | | 89.98 | -1.007 | -0.62 | 71.16 | -2.652 | -1.40 |
| VQZ7DJ | | 90.73 | -0.266 | -0.16 | 72.54 | -1.274 | -0.67 |
| W9BBFL | | 91.35 | 0.359 | 0.22 | 73.11 | -0.699 | -0.37 |
| WN432M | | 90.21 | -0.781 | -0.48 | 71.57 | -2.244 | -1.18 |
| WT2D9F | | 90.34 | -0.654 | -0.40 | 73.83 | 0.021 | 0.01 |
| WWW87G | | 92.23 | 1.240 | 0.76 | 74.04 | 0.230 | 0.12 |
| XJNUDN | | 92.82 | 1.830 | 1.12 | 76.57 | 2.763 | 1.46 |
| YRXJQL | | 91.68 | 0.686 | 0.42 | 74.21 | 0.398 | 0.21 |
| Z3CZUD | | 90.37 | -0.620 | -0.38 | 72.46 | -1.354 | -0.71 |
| Z64Y9B | | 91.54 | 0.549 | 0.34 | 73.75 | -0.059 | -0.03 |
| Z9F7AF | | 89.85 | -1.141 | -0.70 | 73.65 | -0.159 | -0.08 |
| ZCJXHG | | 90.58 | -0.416 | -0.25 | 72.42 | -1.394 | -0.74 |
| ZGUTHJ | | 92.35 | 1.359 | 0.83 | 73.20 | -0.609 | -0.32 |
| ZL8TFB | | 93.66 | 2.672 | 1.64 | 77.43 | 3.625 | 1.91 |
| ZPM24B | | 91.23 | 0.234 | 0.14 | 75.43 | 1.616 | 0.85 |
| ZQYVMG | | 92.07 | 1.081 | 0.66 | 74.51 | 0.704 | 0.37 |
| ZUY7JG | | 94.57 | 3.574 | 2.19 | 75.01 | 1.196 | 0.63 |

| Response Summary | Item 1 | Item 2 | Participants: 103 |
|---|---|---|---|
| **Preparation Concentration** | **91%** | **74%** | |
| Grand Mean | 90.99 | 73.81 | |
| Standard Deviation | 1.634 | 1.896 | |

Participants Included: 98 Participants Excluded: 4 Participants without Raw Data for both items: 1

# Bivariate Control Analysis

Item 1 Grand Mean: 90.99 Item 2 Grand Mean: 73.81




*Not all participants marked as outliers (X) are seen on the graph above due to having mean values that are outside of the x-axis or y-axis percentage ranges.

-End of Report-
(Appendix may follow)

**Collaborative Testing Services ~ Forensic Testing Program**

# Test No. 24-5051: Quantitative Drug Analysis - Methamphetamine HCl

DATA MUST BE SUBMITTED BY **Aug. 05, 2024, 11:59 p.m. EDT** TO BE INCLUDED IN THE REPORT

Participant Code: U1234J WebCode: 9K6TYA

The Accreditation Release section can be accessed by using the "Continue to Final Submission" button above. This information can be entered at any time prior to submitting to CTS.

**Test Description:**
Investigators have submitted two powdered methamphetamine HCl samples from separate cases to be quantitatively examined. Using your laboratory's procedures, analyze each sample and report the quantitative determination of methamphetamine HCl present in the samples.

*-Please follow your laboratory's policies and procedures for sample homogenization.*
*-This is not intended as a qualitative test but rather as a quantitative examination of the methamphetamine HCl present in the samples.*

**Items Submitted (Sample Pack DQ1):**
Items 1 & 2: Powdered methamphetamine HCl samples

**1a.) What is the concentration of methamphetamine HCl in each of the samples? (Results should be reported using your laboratory reporting criteria for decimal places, uncertainty, and units.)**

| | Reported Concentration | Uncertainty (k= ) | Units |
|---|---|---|---|
| Item 1: | | ± | ( ) |
| Item 2: | | ± | ( ) |

**1b.) Are the values listed above:**

- ○ The mean of duplicate / several determinations?
- ○ The lowest value of duplicate / several determinations?
- ○ Other? (Specify):

**2.) Please list your raw data determinations below in percent of methamphetamine HCl. (Results not reported in % will be excluded from statistical calculations.)**

| **Item 1** (%) | **Item 2** (%) |
|---|---|
| | |
| | |
| | |
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| | |
| | |
| | |

**3.) What methods were used to quantitatively examine the items?**

- ☐ GC
- ☐ GC/MS
- ☐ GC/FID
- ☐ LC
- ☐ LC/MS
- ☐ Other (specify):
- ☐ NMR

**4.) Additional Comments**

***Please note:*** *Any additional formatting applied in the free form space below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.*

# RELEASE OF DATA TO ACCREDITATION BODIES

**The Accreditation Release is accessed by pressing the "Continue to Final Submission" button online and can be completed at any time prior to submission to CTS.**

**CTS submits external proficiency test data directly to ANAB and/or A2LA. Please select one of the following statements to ensure your data is handled appropriately.**

○ This participant's data is intended for submission to ANAB and/or A2LA. (Accreditation Release section below must be completed.)
○ This participant's data is **not** intended for submission to ANAB and/or A2LA.

Have the laboratory's designated individual complete the following steps
**only if your laboratory is accredited in this testing/calibration discipline**
by one or more of the following Accreditation Bodies.

**Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory**

**ANAB** Certificate No.

**A2LA** Certificate No.

**Step 2: Complete the Laboratory Identifying Information in its entirety**

Authorized Contact Person and Title

Laboratory Name

Location (City/State)