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FORENSIC TESTING PROGRAM

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Quantitative Drug Analysis - Cocaine HCl
Test No. 20-5061 Summary Report

Each sample set consisted of two items with different concentrations of cocaine HCl. Participants were asked to determine the concentration of cocaine HCl in each item. Data were returned from 85 participants and are compiled into the following tables:

Report Contents:

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 pack consisted of two items containing different concentrations of cocaine HCl and caffeine. Participants were requested to analyze each item and report the quantitative determination of cocaine HCl present in the samples.

SAMPLE PREPARATION -
The appropriate amounts of cocaine HCl and caffeine for each Item were thoroughly mixed to ensure homogeneity.

ITEMS 1 and 2 (PREPARATION): For each Item, approximately 350 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 and heat sealed closed. The heat sealed bag was then placed into a pre-labeled 5 1/2 inch coin envelope.

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

VERIFICATION: Laboratories that conducted predistribution analysis of the samples reported consistent results that were comparable to the preparation concentrations of cocaine HCl. The following methods were used to examine the items: LC, GC/MS, and LC/MS.

Item	Preparation Cocaine HCl
1	35%
2	79%

Summary Comments

This test was designed to allow participants to assess their proficiency in the determination of cocaine HCl concentrations. Each participant was supplied with a sample set consisting of two items containing caffeine and different concentrations of cocaine HCl. Participants were requested to determine the cocaine HCl concentration for both items (Refer to the Manufacturer's Information for preparation details).

The results are separated into two tables: reported results and raw analytical data. 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 data shows the results from each determination made by the laboratory to produce their reported results. Eighty participants reported using the mean of duplicate/several determinations as their reporting procedure. Two participants reported using the lowest value of duplicate/several determinations, one participant reported "the lowest mean value of several determinations", one participant reported "single run", and one participant reported "The average pure drug weight from 3 aliquots, each injected in triplicate".

The raw data was used to calculate the grand mean and the standard deviation (STD) for each item. One participant reported "extreme" data (±3 STD from the grand mean) for Item 1. No participants reported "extreme" data for Item 2. The calculated grand mean of Item 1 was 32.58 with a standard deviation of 2.441, and the grand mean of Item 2 was 74.91 with a standard deviation of 4.744. These calculations are provided to assist the participants and accrediting bodies in determining the acceptability of the results.

As a supplemental examination of the raw data, Bivariate Control Analysis was also performed to analyze the measurements 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 95% of the time a randomly selected participant was inside of it. Two participants, whose results fell outside of the 95% ellipse, but within the 99% control limit, were marked with a "*". Five participants, whose results fell outside of the 99% control limit, were marked with an "X" and also excluded from the calculations. One participant who did not report raw data for either item was marked with an "M" and also excluded from the calculations. The vertical orientation of the ellipse, as opposed to a 45 degree orientation, indicates that the statistical variation in Item 2 is higher in comparison to Item 1. For more information regarding Bivariate Control Analysis, please see the supplemental section at the end of this report.

Participants used a variety of methods to examine the samples. The most common method of analysis utilized was GC/FID, followed by LC.

Reported Results

What is the concentration of cocaine HCl in each of the samples?

TABLE 1

WebCode	Item 1 Reported Concentration (units)	Item 2 Reported Concentration (units)	Uncertainty (k)
Preparation concentration:	**35%**	**79%**	
2DPHWV	30.4 ± 1.0 (%)	79.8 ± 1.0 (%)	2
2MF43T	33.2 ± 4.4 (%)	74.1 ± 9.7 (%)	3.12
2PJYLW	36 ± 6 (%)	80 ± 10 (%)	2.65
36UZVR	31.5 ± 4.1 (%)	60.8 ± 8.0 (%)	3.12
3DN6NT	30.5 ± 1.7 (%)	76.0 ± 1.7 (%)	2
3EF43R	28.7 ± 1.82	71.5 ± 1.49	Item 1= 3.18; Item 2 = 2.78
3GNFKT	32.4 ± 1.7 (%)	76.4 ± 1.7 (%)	2
3JBX3D	30.0 ± 3.9 (%)	73.5 ± 9.6 (%)	3.12
3LEQUR	33.0 ± 0.4 (% by weight)	77.3 ± 0.6 (% by weight)	2
3U9VNT	32.9 ± 4.3 (%)	73.4 ± 9.6 (%)	3.12
3XAYFE	29.4 ± 3.9 (%)	70.9 ± 9.3 (%)	3.12
4JAKRQ	30.8 ± 4.1 (%)	71.4 ± 9.3 (%)	3.12
4UNHXU	290 (µg/mg)	669 (µg/mg)	
6499WR	35.2 ± 1.0 (%)	77.1 ± 1.0 (%)	2
6FL9TK	34.70 (%)	78.27 (%)	
6LTYVQ	35.45 ± 1.7 (%)	82.53 ± 1.7 (%)	2
6TABBD	36 ± 3.3 (%)	84 ± 7.6 (%)	2.576
6YXVET	30 ± 4 (%w/w)	77 ± 10 (%w/w)	2

TABLE 1

WebCode	Item 1 Reported Concentration (units)	Item 2 Reported Concentration (units)	Uncertainty (k)
Preparation concentration:	**35%**	**79%**	
79X6YM	29.3 ± 1.1 (%)	80.1 ± 3.6 (%)	2
7JJ97M	34.2 ± 0.5 (%)	78.0 ± 0.5 (%)	1.96
8R8JV9	31.8 ± 4.2 (%)	75.0 ± 9.8 (%)	3.12
8XGKEQ	34 ± 3.4 (%)	78 ± 7.8 (%)	1
9D78XN	32 ± 3 (%w/w)	73 ± 6 (%w/w)	2
9G7HUN	32 ± 6 (%)	79 ± 6 (%)	3
9LWT4M	31.5 ± 4.1 (%)	69.0 ± 9.0 (%)	3.12
AGMRK4	30.6 ± 3.4 (%)	73.7 ± 8.2 (%)	2.576
AVK4T9	35 ± 8 (mg)	79 ± 18 (mg)	2
BC6UQL	33.8 ± 1.0 (%)	77.7 ± 1.0 (%)	2
BDFWE7	31.2 ± 4.1 (%)	72.4 ± 9.5 (%)	3.12
BEQXZ6	31.0 ± 4.1 (%)	69.0 ± 9.0 (%)	3.12
BJ84WE	36.4 ± 4.7 (%)	78.0 ± 4.7 (%)	2
BLA26L	34 ± 3 (wt/wt %)	80 ± 7 (wt/wt %)	2
BXQLR4	30.3 ± 3.4 (%)	70.5 ± 7.8 (%)	2.576
D477PZ	32.4 ± 3.6 (%)	75.7 ± 8.4 (%)	2.576
D8N9UK	33 ± 4.719 (weight/weight%)	78 ± 11.154 (weight/weight%)	2
EBYXBY	34.0 ± 3.8 (%)	73.7 ± 8.2 (%)	2.576
EYN9UH	34.8 ± 1.7 (%)	83.1 ± 1.7 (%)	2
F98YW2	28.0 ± 3.7 (%)	65.3 ± 8.5 (%)	3.12

TABLE 1

WebCode	Item 1 Reported Concentration (units)	Item 2 Reported Concentration (units)	Uncertainty (k)
Preparation concentration:	**35%**	**79%**	
FAH2HY	36.1 ± 1.0 (%)	77.0 ± 1.0 (%)	3
G2MHGW	31.5 ± 3.5 (%)	72.9 ± 8.1 (%)	2.576
G8WJZE	31.5 ± 4.1 (%)	75.2 ± 9.8 (%)	3.12
GBUZD9	38.14 ± 5.77 (%)	79.44 ± 5.09 (()	2
GDWXN2	34.3 ± 3.4 (%)	81.6 ± 7.8 (%)	2.65
GJ3RHW	32.8 ± 3.7 (%)	73.3 ± 8.1 (%)	2.576
H62FLX	33.0 ± 4.3 (%)	74.7 ± 9.8 (%)	3.12
HFGAZC	27.0 ± 3.3 (%)	77.7 ± 2.5 (%)	2
HJK6JE	34 ± 2 (%w/w)	79 ± 5 (%w/w)	2
HKB4XD	28.4 ± 3.7 (%)	67.4 ± 8.8 (%)	3.12
HND6ZV	34.2 ± 3.8 (%)	76.4 ± 8.5 (%)	2.576
HT7AQE	33.7 ± 1.0 (%)	78.3 ± 1.0 (%)	2
J2FX4D	35.3 ± 1.7 (%)	78.0 ± 1.7 (%)	2
J6GY7V	35.5 ± 4.0 (percent)	74.1 ± 8.2 (percent)	2.576
JKQMGB	34.4 ± 0.8 (%)	78.1 ± 0.8 (%)	1.96
JWYPFD	8.7 ± 2.8 (% m/m)	74 ± 2.8 (% m/m)	2
K9BEU9	32.39 ± 2.31 (%)	72.39 ± 3.74 (%)	3
KPYPGB	31.7 ± 5 (%)	76.4 ± 5 (%)	2
LHFMBU	30.29 ± 2.16 (%W/W)	70.14 ± 5.12 (%W/W)	2
LTEKW9	31.1 ± 4.1 (%)	70.9 ± 9.3 (%)	3.12
LX9EUA	33.5 ± 1.7 (%)	81.5 ± 1.7 (%)	2

TABLE 1

WebCode	Item 1 Reported Concentration (units)	Item 2 Reported Concentration (units)	Uncertainty (k)
Preparation concentration:	**35%**	**79%**	
LYZD99	30.5 ± 2.5 (%)	78.1 ± 3.8 (%)	2
MQQ9X3	30.3 ± 2 (%)	69.3 ± 3 (%)	2
NGXCA8	28.6 ± 3.8 (%)	68.0 ± 8.9 (%)	3.12
NRVFD2	38.9 ± 0.6 (%)	75 ± 0.1 (%)	
NXH397	32.5 ± 4.3 (%)	68.4 ± 8.9 (%)	3.12
PBPBQN	33.5 ± 3.7 (%)	73.8 ± 8.2 (%)	2.576
QV833Q	29.2 ± 3.8 (%)	65.1 ± 8.5 (%)	3.12
RC8CJ2	35.8 ± 2.1 (%)	81.8 ± 2.9 (%)	3
RM6CW7	35.8 ± 1.7 (%)	77.9 ± 1.7 (%)	2
T7FN22	29.0 ± 3.8 (%)	68.9 ± 9.0 (%)	3.12
T97P8P	35.7 ± 5.1 (%)	85.0 ± 8.5 (%)	2.65
VPP4YL	31.0 ± 4.1 (%)	66.0 ± 8.6 (%)	3.12
VWNPNZ	35.2 ± 1.7 (%)	78.6 ± 1.7 (%)	2
WK4XDW	35.0 ± 1.8 (%)	76.2 ± 4.0 (%)	2
WRM2KY	33.7 ± 4.4 (%)	75.7 ± 9.9 (%)	3.12
WVAH3J	30.3 ± 1.5 (%)	75.5 ± 10.6 (%)	
X33ANH	31.0 ± 4.1 (%)	72.1 ± 9.4 (%)	3.12
XLEZ2F	31.0 ± 3.5 (%)	73.5 ± 8.1 (%)	2.576
XTX37X	31.3 ± 4.1 (%)	72.9 ± 9.5 (%)	3.12
XVJ8FF	33.1 ± 3.7 (%)	71.9 ± 8.0 (%)	2.576
YTR93H	29.8 ± 3.9 (%)	71.6 ± 9.4 (%)	3.12

TABLE 1

WebCode	Item 1 Reported Concentration (units)	Item 2 Reported Concentration (units)	Uncertainty (k)
Preparation concentration:	**35%**	**79%**	
YYGT6X	32.3 ± 1.7 (%)	73.9 ± 1.7 (%)	2
Z7CAVU	30.7 ± 2.2 (%)	75.6 ± 1.0 (%)	2
ZMZKHW	35.5 ± 1.0 (%)	75.6 ± 1.0 (%)	2
ZQM3ZG	32.0 ± 4.2 (%)	71.3 ± 9.3 (%)	3.12
ZUHT9D	33.1 ± 3.7	71.0 ± 7.9	2.576

Reporting Procedures

TABLE 2

WebCode	Reporting Procedures
2DPHWV	The mean of duplicate/several determinations.
2MF43T	The mean of duplicate/several determinations.
2PJYLW	The mean of duplicate/several determinations.
36UZVR	The mean of duplicate/several determinations.
3DN6NT	The mean of duplicate/several determinations.
3EF43R	The mean of duplicate/several determinations.
3GNFKT	The mean of duplicate/several determinations.
3JBX3D	The mean of duplicate/several determinations.
3LEQUR	The lowest mean value of several determinations
3U9VNT	The mean of duplicate/several determinations.
3XAYFE	The mean of duplicate/several determinations.
4JAKRQ	The mean of duplicate/several determinations.
4UNHXU	The mean of duplicate/several determinations.
6499WR	The mean of duplicate/several determinations.
6FL9TK	The mean of duplicate/several determinations.
6LTYVQ	The mean of duplicate/several determinations.
6TABBD	The mean of duplicate/several determinations.
6YXVET	The mean of duplicate/several determinations.
79X6YM	The mean of duplicate/several determinations.
7JJ97M	The mean of duplicate/several determinations.
8R8JV9	The mean of duplicate/several determinations.
8XGKEQ	The lowest value of duplicate/several determinations.
9D78XN	The mean of duplicate/several determinations.
9G7HUN	The mean of duplicate/several determinations.
9LWT4M	The mean of duplicate/several determinations.

TABLE 2

WebCode	Reporting Procedures
AGMRK4	The mean of duplicate/several determinations.
AVK4T9	The mean of duplicate/several determinations.
BC6UQL	The mean of duplicate/several determinations.
BDFWE7	The mean of duplicate/several determinations.
BEQXZ6	The mean of duplicate/several determinations.
BJ84WE	The mean of duplicate/several determinations.
BLA26L	The mean of duplicate/several determinations.
BXQLR4	The mean of duplicate/several determinations.
D477PZ	The mean of duplicate/several determinations.
D8N9UK	single run
EBYXBY	The mean of duplicate/several determinations.
EYN9UH	The mean of duplicate/several determinations.
F98YW2	The mean of duplicate/several determinations.
FAH2HY	The mean of duplicate/several determinations.
G2MHGW	The mean of duplicate/several determinations.
G8WJZE	The mean of duplicate/several determinations.
GBUZD9	The mean of duplicate/several determinations.
GDWXN2	The mean of duplicate/several determinations.
GJ3RHW	The mean of duplicate/several determinations.
H62FLX	The mean of duplicate/several determinations.
HFGAZC	The mean of duplicate/several determinations.
HJK6JE	The mean of duplicate/several determinations.
HKB4XD	The mean of duplicate/several determinations.
HND6ZV	The average pure drug weight from 3 aliquots, each injected in triplicate.
HT7AQE	The mean of duplicate/several determinations.
J2FX4D	The mean of duplicate/several determinations.

TABLE 2

WebCode	Reporting Procedures
J6GY7V	The mean of duplicate/several determinations.
JKQMGB	The mean of duplicate/several determinations.
JWYPFD	The lowest value of duplicate/several determinations.
K9BEU9	The mean of duplicate/several determinations.
KPYPGB	The mean of duplicate/several determinations.
LHFMBU	The mean of duplicate/several determinations.
LTEKW9	The mean of duplicate/several determinations.
LX9EUA	The mean of duplicate/several determinations.
LYZD99	The mean of duplicate/several determinations.
MQQ9X3	The mean of duplicate/several determinations.
NGXCA8	The mean of duplicate/several determinations.
NRVFD2	The mean of duplicate/several determinations.
NXH397	The mean of duplicate/several determinations.
PBPBQN	The mean of duplicate/several determinations.
QV833Q	The mean of duplicate/several determinations.
RC8CJ2	The mean of duplicate/several determinations.
RM6CW7	The mean of duplicate/several determinations.
T7FN22	The mean of duplicate/several determinations.
T97P8P	The mean of duplicate/several determinations.
VPP4YL	The mean of duplicate/several determinations.
VWNPNZ	The mean of duplicate/several determinations.
WK4XDW	The mean of duplicate/several determinations.
WRM2KY	The mean of duplicate/several determinations.
WVAH3J	The mean of duplicate/several determinations.
X33ANH	The mean of duplicate/several determinations.
XLEZ2F	The mean of duplicate/several determinations.

TABLE 2

WebCode	Reporting Procedures
XTX37X	The mean of duplicate/several determinations.
XVJ8FF	The mean of duplicate/several determinations.
YTR93H	The mean of duplicate/several determinations.
YYGT6X	The mean of duplicate/several determinations.
Z7CAVU	The mean of duplicate/several determinations.
ZMZKHW	The mean of duplicate/several determinations.
ZQM3ZG	The mean of duplicate/several determinations.
ZUHT9D	The mean of duplicate/several determinations.

Response Summary

Participants: **85**

The mean of duplicate/several determinations:	80	(94.1%)
The lowest value of duplicate/several determinations:	2	(2.4%)
Other:	3	(3.5%)

Raw Data

List of raw data determinations in percent.

TABLE 3 - Item 1

WebCode	Preparation target concentration : 35%								Mean
2DPHWV	31.12	31.18	31.21	29.66	29.60	29.75			30.42
2MF43T	33.00	33.60							33.30
2PJYLW	35.80	35.20	33.60	37.10	36.80	37.10			35.93
36UZVR	32.80	30.10							31.45
3DN6NT	30.27	30.28	30.78	30.83					30.54
3EF43R	29.70	27.50	28.60	29.10					28.73
3GNFKT	32.63	32.66	32.20	32.19					32.42
3JBX3D	30.30	29.70							30.00
3LEQUR	33.30	32.90	32.90	32.90					33.00
3U9VNT	32.60	33.40							33.00
3XAYFE	29.00	29.90							29.45
4JAKRQ	31.50	30.10							30.80
4UNHXU	27.74	30.29							29.02
6499WR	34.92	35.08	35.02	35.44	35.50	35.50			35.24
6FL9TK	34.25	35.13	34.72	34.50	34.90				34.70
6LTYVQ	34.99	34.84	35.97	36.01					35.45
6TABBD	36.80	37.51	35.82						36.71
6YXVET	30.74	28.77	29.10	29.79					29.60
79X6YM	29.80	29.40	29.60	29.90	28.90	28.90	29.00	29.20	29.34
7JJ97M	33.80	33.72	34.78	34.70					34.25
8R8JV9	31.50	32.20							31.85
8XGKEQ	34.04	34.38							34.21
9D78XN	31.87	32.04	32.72	33.09					32.43
9G7HUN	34.12	34.14	31.39	31.30	31.88	31.96			32.46

TABLE 3 - Item 1

WebCode	Preparation target concentration : 35%								Mean
9LWT4M	31.60	31.30							31.45
AGMRK4	30.40	31.30	30.10						30.60
BC6UQL	34.11	34.12	34.11	33.43	33.41	33.51			33.78
BDFWE7	32.00	30.60							31.30
BEQXZ6	31.60	30.60							31.10
BJ84WE	34.60	36.70	38.30	36.10					36.43
BLA26L	35.00	33.00							34.00
BXQLR4	29.50	30.80	30.70						30.33
D477PZ	32.60	32.60	32.00						32.40
D8N9UK	33.00								33.00
EBYXBY	33.90	34.80	33.40						34.03
EYN9UH	34.50	35.10	34.60	35.10					34.83
F98YW2	28.00	28.10							28.05
FAH2HY	38.00	37.00	34.00	37.30	34.50	35.90			36.12
G2MHGW	31.70	31.50	31.20						31.47
G8WJZE	31.60	31.50							31.55
GBUZD9	41.56	40.77	40.25	40.53	37.94	33.97	34.34	35.69	38.13
GDWXN2	33.03	34.13	35.15	33.84	34.90	34.72			34.30
GJ3RHW	33.00	32.80	32.50						32.77
H62FLX	33.10	33.00							33.05
HFGAZC	28.70	27.90	28.50	28.60	25.50	25.70	25.50	25.70	27.01
HJK6JE	40.10	33.10	31.40	31.40					34.00
HKB4XD	28.10	28.90							28.50
HND6ZV	34.60	34.10	33.90						34.20
HT7AQE	33.22	33.16	33.25	34.34	34.21	34.28			33.74

TABLE 3 - Item 1

WebCode	Preparation target concentration : 35%								Mean
J2FX4D	35.96	36.05	34.73	34.70					35.36
J6GY7V	36.20	34.80	35.60						35.53
JKQMGB	33.99	33.97	34.96	34.83					34.44
JWYPFD	8.500	8.800							8.650 X
K9BEU9	32.47	31.75	34.11						32.78
KPYPGB	31.32	31.35	32.08	32.10					31.71
LHFMBU	30.32	30.28							30.30
LTEKW9	31.00	31.30							31.15
LX9EUA	34.69	34.73	32.21	32.39					33.51
LYZD99	29.21	29.23	29.66	29.77	31.34	31.64	31.79	31.54	30.52
MQQ9X3	30.30	30.50	30.30	30.60	30.90	29.30			30.32
NGXCA8	28.80	28.60							28.70
NRVFD2	39.40	38.50							38.95
NXH397	33.40	31.60							32.50
PBPBQN	33.20	34.00	33.40						33.53
QV833Q	29.70	28.80							29.25
RC8CJ2	36.50	34.20	35.90	36.50					35.78
RM6CW7	33.70	33.76	37.87	37.96					35.82
T7FN22	29.70	28.40							29.05
T97P8P	38.36	34.19	34.95	35.31	34.47	36.95			35.71
VPP4YL	31.00	31.00							31.00
VWNPNZ	35.82	35.82	34.71	34.76					35.28
WK4XDW	36.00	34.02							35.01
WRM2KY	33.50	33.90							33.70
WVAH3J	33.90								33.90

TABLE 3 - Item 1

WebCode	Preparation target concentration : 35%								Mean
X33ANH	31.10	31.00							31.05
XLEZ2F	31.10	31.00	31.00						31.03
XTX37X	30.30	32.50							31.40
XVJ8FF	33.70	31.60	34.10						33.13
YTR93H	29.40	30.20							29.80
YYGT6X	32.19	32.23	32.43	32.43					32.32
Z7CAVU	31.70	31.70	31.40	31.70	29.60	29.70	29.40	29.80	30.63
ZMZKHW	35.21	35.23	35.19	35.68	35.73	35.72			35.46
ZQM3ZG	32.30	31.80							32.05
ZUHT9D	32.70	34.20	32.30						33.07

Statistical Analysis for Item 1

Participants: **85**

Preparation Target Concentration:	35%	Number of Participants Included:	83
Grand Mean:	32.58	Number of Participants Excluded:	1
Standard Deviation:	2.441	Number of Participants without Raw Data:	1

TABLE 3 - Item 2

WebCode	Preparation target concentration : 79%								Mean
2DPHWV	78.07	77.97	78.05	81.48	81.55	81.65			79.79
2MF43T	74.50	73.60							74.05
2PJYLW	78.90	81.00	80.50	82.00	81.00	78.20			80.27
36UZVR	63.30	58.50							60.90
3DN6NT	77.37	77.56	74.60	74.71					76.06
3EF43R	70.10	74.60	69.50	72.90	70.50				71.52
3GNFKT	76.58	76.61	76.31	76.38					76.47
3JBX3D	73.50	73.50							73.50
3LEQUR	77.20	77.30	76.80	77.70					77.25
3U9VNT	73.20	73.70							73.45
3XAYFE	72.60	69.30							70.95
4JAKRQ	72.40	70.40							71.40
4UNHXU	67.92	66.04							66.98
6499WR	77.30	77.43	77.32	76.75	76.81	76.87			77.08
6FL9TK	78.26	78.35	78.63	78.16	77.95				78.27
6LTYVQ	83.89	84.43	80.60	81.23					82.54
6TABBD	83.87	86.68	83.30						84.62
6YXVET	76.46	75.67	77.57	78.32					77.00
79X6YM	78.40	79.00	79.30	79.80	81.30	80.40	81.60	81.90	80.21
7JJ97M	77.84	77.82	78.11	78.17					77.99
8R8JV9	74.80	75.20							75.00
8XGKEQ	78.21	78.48							78.35
9D78XN	72.47	72.41	74.33	74.74					73.49
9G7HUN	80.94	81.41	78.22	77.48	78.25	78.53			79.14
9LWT4M	69.90	68.10							69.00

TABLE 3 - Item 2

WebCode	Preparation target concentration : 79%								Mean
AGMRK4	72.40	73.20	75.50						73.70
BC6UQL	77.69	77.73	77.68	77.63	77.77	77.77			77.71
BDFWE7	72.40	72.50							72.45
BEQXZ6	69.90	68.20							69.05
BJ84WE	76.80	81.40	79.20	74.70					78.03
BLA26L	78.00	82.00							80.00
BXQLR4	71.30	69.10	71.00						70.47
D477PZ	76.90	75.20	74.90						75.67
D8N9UK	78.00								78.00
EBYXBY	73.00	74.30	73.80						73.70
EYN9UH	86.90	81.10	81.10	83.20					83.08
F98YW2	65.30	65.40							65.35
FAH2HY	76.40	75.30	75.90	77.20	78.50	78.90			77.03
G2MHGW	73.10	73.20	72.40						72.90
G8WJZE	74.50	76.00							75.25
GBUZD9	81.53	78.67	75.05	80.08	79.97	79.53	77.21	78.81	78.86
GDWXN2	81.76	80.74	84.23	79.09	81.07	82.81			81.62
GJ3RHW	72.50	73.50	74.00						73.33
H62FLX	74.60	75.00							74.80
HFGAZC	77.50	76.20	77.30	77.80	77.70	79.00	77.60	78.70	77.73
HJK6JE	79.70	78.40							79.05
HKB4XD	66.10	68.90							67.50
HND6ZV	76.50	76.40	76.30						76.40
HT7AQE	79.84	79.87	79.82	76.75	76.81	76.82			78.32
J2FX4D	77.38	77.39	78.74	78.60					78.03

TABLE 3 - Item 2

WebCode	Preparation target concentration : 79%								Mean
J6GY7V	75.60	74.20	72.50						74.10
JKQMGB	77.52	77.40	78.66	78.69					78.07
JWYPFD	73.00	74.00							73.50
K9BEU9	73.64	75.44	69.92	72.69	70.26				72.39
KPYPGB	76.80	76.90	75.98	76.01					76.42
LHFMBU	70.52	69.78							70.15
LTEKW9	71.40	70.50							70.95
LX9EUA	78.82	80.52	82.54	84.29					81.54
LYZD99	76.33	76.49	76.91	77.13	78.98	79.60	79.82	79.58	78.11
MQQ9X3	71.90	68.50	66.80	71.70	70.20	66.80			69.32
NGXCA8	70.00	66.00							68.00
NRVFD2	75.10	75.00							75.05
NXH397	69.10	67.90							68.50
PBPBQN	73.10	75.90	72.30						73.77
QV833Q	66.80	63.40							65.10
RC8CJ2	79.80	84.20	81.50	82.00	81.40				81.78
RM6CW7	78.15	78.28	77.59	77.61					77.91
T7FN22	68.30	69.60							68.95
T97P8P	82.81	84.98	82.36	85.87	87.22	87.01			85.04
VPP4YL	66.30	65.80							66.05
VWNPNZ	77.46	77.63	79.77	79.82					78.67
WK4XDW	74.20	78.16							76.18
WRM2KY	76.30	75.20							75.75
WVAH3J	84.50								84.50
X33ANH	74.20	70.20							72.20

TABLE 3 - Item 2

WebCode	Preparation target concentration : 79%								Mean
XLEZ2F	74.40	73.20	72.90						73.50
XTX37X	74.50	71.40							72.95
XVJ8FF	73.30	69.30	73.00						71.87
YTR93H	72.50	70.80							71.65
YYGT6X	75.69	75.81	72.07	72.13					73.93
Z7CAVU	75.90	75.40	76.10	75.40	75.50	74.90	75.50	75.80	75.56
ZMZKHW	73.19	73.20	73.11	78.02	77.91	77.96			75.57
ZQM3ZG	71.70	70.80							71.25
ZUHT9D	74.50	70.30	68.40						71.07

Statistical Analysis for Item 2

Participants: **85**

Preparation Target Concentration:	79%	Number of Participants Included:	84
Grand Mean:	74.91	Number of Participants Excluded:	0
Standard Deviation:	4.744	Number of Participants without Raw Data:	1

TABLE 3 - Response Summary

Response Summary	Item 1	Item 2
Preparation concentration	**35%**	**79%**
Grand Mean	32.58	74.91
Standard Deviation	2.441	4.744

Method of Analysis

TABLE 4

WebCode	GC	LC	FTIR	GC/MS	LC/MS	UV	GC/FID	Other
2DPHWV							✓	
2MF43T							✓	
2PJYLW		✓						
36UZVR							✓	
3DN6NT							✓	
3EF43R							✓	
3GNFKT							✓	
3JBX3D							✓	
3LEQUR								NMR
3U9VNT							✓	
3XAYFE							✓	
4JAKRQ							✓	
4UNHXU		✓						
6499WR							✓	
6FL9TK		✓				✓		
6LTYVQ							✓	
6TABBD					✓			
6YXVET					✓			
79X6YM							✓	
7JJ97M							✓	
8R8JV9							✓	
8XGKEQ							✓	
9D78XN		✓						
9G7HUN							✓	
9LWT4M							✓	
AGMRK4							✓	
AVK4T9								HPLC
BC6UQL							✓	
BDFWE7							✓	
BEQXZ6							✓	
BJ84WE				✓				
BLA26L								HPLC with UV detector

TABLE 4

WebCode	GC	LC	FTIR	GC/MS	LC/MS	UV	GC/FID	Other
BXQLR4							✓	
D477PZ							✓	
D8N9UK				✓				
EBYXBY							✓	
EYN9UH							✓	
F98YW2							✓	
FAH2HY		✓						
G2MHGW							✓	
G8WJZE							✓	
GBUZD9		✓				✓		
GDWXN2							✓	
GJ3RHW							✓	
H62FLX							✓	
HFGAZC							✓	
HJK6JE							✓	
HKB4XD							✓	
HND6ZV							✓	
HT7AQE							✓	
J2FX4D							✓	
J6GY7V							✓	
JKQMGB							✓	
JWYPFD		✓						HPLC/UV
K9BEU9							✓	
KPYPGB							✓	
LHFMBU		✓						
LTEKW9							✓	
LX9EUA							✓	
LYZD99							✓	
MQQ9X3				✓			✓	
NGXCA8							✓	
NRVFD2					✓			
NXH397							✓	
PBPBQN							✓	

TABLE 4

WebCode	GC	LC	FTIR	GC/MS	LC/MS	UV	GC/FID	Other
QV833Q							✓	
RC8CJ2							✓	
RM6CW7							✓	
T7FN22							✓	
T97P8P							✓	
VPP4YL							✓	
VWNPNZ							✓	
WK4XDW								NMR
WRM2KY							✓	
WVAH3J	✓	✓						
X33ANH							✓	
XLEZ2F							✓	color test
XTX37X							✓	
XVJ8FF							✓	
YTR93H							✓	
YYGT6X							✓	
Z7CAVU							✓	
ZMZKHW							✓	
ZQM3ZG							✓	
ZUHT9D							✓	

Response Summary Participants: **85**

	GC	LC	FTIR	GC/MS	LC/MS	UV	GC/FID
Participants	1	9	0	3	3	2	67
Percent	1.2%	10.6%	0.0%	3.5%	3.5%	2.4%	78.8%

Additional Comments

TABLE 5

WebCode	Additional Comments
3LEQUR	4 replicates were run per items using the Quant-NMR experiment. The peak purities of 4 cocaine HCl proton peaks were determined using maleic acid as the internal standard. The 4 peak purities were calculated for each replicate and were averaged. The lowest average peak purity was used in determining the percent of cocaine HCl in each item.
AVK4T9	The [Laboratory] does not typically report quantitative values in percentage form and we also incorporate a base factor into our calculations.
BJ84WE	20-5061 item 2 presented a pasty appearance, making it difficult to weigh for quantification.
GBUZD9	Please note that due to a rather large discrepancy in data we analyzed each sample nine times; above only eight fields are available for entering the raw data. In the following all nine raw data values are given (in percent): Item #1: 41.56, 40.77, 40.25, 40.53, 37.94, 33.97, 34.34, 35.69, 38.19. Item #2: 81.53, 78.67, 75.05, 80.08, 79.97, 79.53, 77.21, 78.81, 84.08.
JWYPFD	Quantification according to the legislation is not necessary to prove the crime, since 2017 quantification tests have not been carried out in this laboratory. The percentage of cocaine HCl is reported in units of percentage by mass, grams of analyte per 100 grams of sample.
LHFMBU	Caffeine detected in both items.
MQQ9X3	Both samples are cut by 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 95% 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 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 95% ellipse, but within a 99% control limit (ellipse) that is calculated.
X	Excluded	Results fall outside of 99% 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
2DPHWV	*	30.42	-2.206	-0.89	79.79	4.792	1.03
2MF43T		33.30	0.675	0.29	74.05	-0.953	-0.18
2PJYLW		35.93	3.308	1.37	80.27	5.264	1.13
36UZVR	X	31.45	-1.175	-0.46	60.90	-14.103	-2.95
3DN6NT		30.54	-2.086	-0.84	76.06	1.056	0.24
3EF43R		28.73	-3.900	-1.58	71.52	-3.483	-0.71
3GNFKT		32.42	-0.205	-0.07	76.47	1.466	0.33
3JBX3D		30.00	-2.625	-1.06	73.50	-1.503	-0.30
3LEQUR		33.00	0.375	0.17	77.25	2.247	0.49
3U9VNT		33.00	0.375	0.17	73.45	-1.553	-0.31
3XAYFE		29.45	-3.175	-1.28	70.95	-4.053	-0.84
4JAKRQ		30.80	-1.825	-0.73	71.40	-3.603	-0.74
4UNHXU		29.02	-3.610	-1.46	66.98	-8.023	-1.67
6499WR		35.24	2.617	1.09	77.08	2.078	0.46
6FL9TK		34.70	2.075	0.87	78.27	3.267	0.71
6LTYVQ		35.45	2.828	1.18	82.54	7.533	1.61
6TABBD		36.71	4.085	1.69	84.62	9.614	2.05
6YXVET		29.60	-3.027	-1.22	77.00	2.002	0.44
79X6YM	X	29.34	-3.288	-1.33	80.21	5.210	1.12
7JJ97M		34.25	1.625	0.68	77.99	2.982	0.65
8R8JV9		31.85	-0.775	-0.30	75.00	-0.003	0.02
8XGKEQ		34.21	1.585	0.67	78.35	3.342	0.72
9D78XN		32.43	-0.196	-0.06	73.49	-1.515	-0.30
9G7HUN		32.46	-0.162	-0.05	79.14	4.133	0.89
9LWT4M		31.45	-1.175	-0.46	69.00	-6.003	-1.25

		Item 1			Item 2		
WebCode	Data Flag	Participant Mean	Difference from Grand Mean	CPV	Participant Mean	Difference from Grand Mean	CPV
AGMRK4		30.60	-2.025	-0.81	73.70	-1.303	-0.26
AVK4T9	M						
BC6UQL		33.78	1.155	0.49	77.71	2.709	0.59
BDFWE7		31.30	-1.325	-0.52	72.45	-2.553	-0.52
BEQXZ6		31.10	-1.525	-0.61	69.05	-5.953	-1.24
BJ84WE		36.43	3.800	1.58	78.03	3.022	0.66
BLA26L		34.00	1.375	0.58	80.00	4.997	1.07
BXQLR4		30.33	-2.292	-0.92	70.47	-4.536	-0.94
D477PZ		32.40	-0.225	-0.07	75.67	0.664	0.16
D8N9UK		33.00	0.375	0.17	78.00	2.997	0.65
EBYXBY		34.03	1.408	0.60	73.70	-1.303	-0.26
EYN9UH		34.83	2.200	0.92	83.08	8.072	1.72
F98YW2		28.05	-4.575	-1.86	65.35	-9.653	-2.02
FAH2HY		36.12	3.491	1.45	77.03	2.031	0.45
G2MHGW		31.47	-1.159	-0.46	72.90	-2.103	-0.42
G8WJZE		31.55	-1.075	-0.42	75.25	0.247	0.07
GBUZD9	*	38.13	5.506	2.27	78.86	3.854	0.83
GDWXN2		34.30	1.670	0.70	81.62	6.614	1.41
GJ3RHW		32.77	0.141	0.08	73.33	-1.669	-0.33
H62FLX		33.05	0.425	0.19	74.80	-0.203	-0.02
HFGAZC	X	27.01	-5.613	-2.28	77.73	2.722	0.59
HJK6JE		34.00	1.375	0.58	79.05	4.047	0.87
HKB4XD		28.50	-4.125	-1.67	67.50	-7.503	-1.56
HND6ZV		34.20	1.575	0.66	76.40	1.397	0.31
HT7AQE		33.74	1.118	0.48	78.32	3.315	0.72
J2FX4D		35.36	2.734	1.14	78.03	3.026	0.66
J6GY7V		35.53	2.908	1.21	74.10	-0.903	-0.17

		Item 1			Item 2		
WebCode	Data Flag	Participant Mean	Difference from Grand Mean	CPV	Participant Mean	Difference from Grand Mean	CPV
JKQMGB		34.44	1.812	0.76	78.07	3.065	0.67
JWYPFD	X	8.650	-23.975	-9.80	73.50	-1.503	-0.30
K9BEU9		32.78	0.151	0.08	72.39	-2.613	-0.53
KPYPGB		31.71	-0.915	-0.36	76.42	1.421	0.32
LHFMBU		30.30	-2.325	-0.93	70.15	-4.853	-1.00
LTEKW9		31.15	-1.475	-0.59	70.95	-4.053	-0.84
LX9EUA		33.51	0.882	0.38	81.54	6.542	1.40
LYZD99		30.52	-2.103	-0.84	78.11	3.102	0.67
MQQ9X3		30.32	-2.309	-0.93	69.32	-5.686	-1.18
NGXCA8		28.70	-3.925	-1.59	68.00	-7.003	-1.46
NRVFD2	X	38.95	6.325	2.61	75.05	0.047	0.03
NXH397		32.50	-0.125	-0.03	68.50	-6.503	-1.35
PBPBQN		33.53	0.908	0.39	73.77	-1.236	-0.24
QV833Q		29.25	-3.375	-1.36	65.10	-9.903	-2.07
RC8CJ2		35.78	3.150	1.31	81.78	6.777	1.45
RM6CW7		35.82	3.197	1.33	77.91	2.905	0.63
T7FN22		29.05	-3.575	-1.45	68.95	-6.053	-1.26
T97P8P		35.71	3.080	1.28	85.04	10.039	2.14
VPP4YL		31.00	-1.625	-0.65	66.05	-8.953	-1.87
VWNPNZ		35.28	2.652	1.10	78.67	3.667	0.79
WK4XDW		35.01	2.385	1.00	76.18	1.177	0.27
WRM2KY		33.70	1.075	0.46	75.75	0.747	0.18
WVAH3J		33.90	1.275	0.54	84.50	9.497	2.02
X33ANH		31.05	-1.575	-0.63	72.20	-2.803	-0.57
XLEZ2F		31.03	-1.592	-0.63	73.50	-1.503	-0.30
XTX37X		31.40	-1.225	-0.48	72.95	-2.053	-0.41
XVJ8FF		33.13	0.508	0.23	71.87	-3.136	-0.64

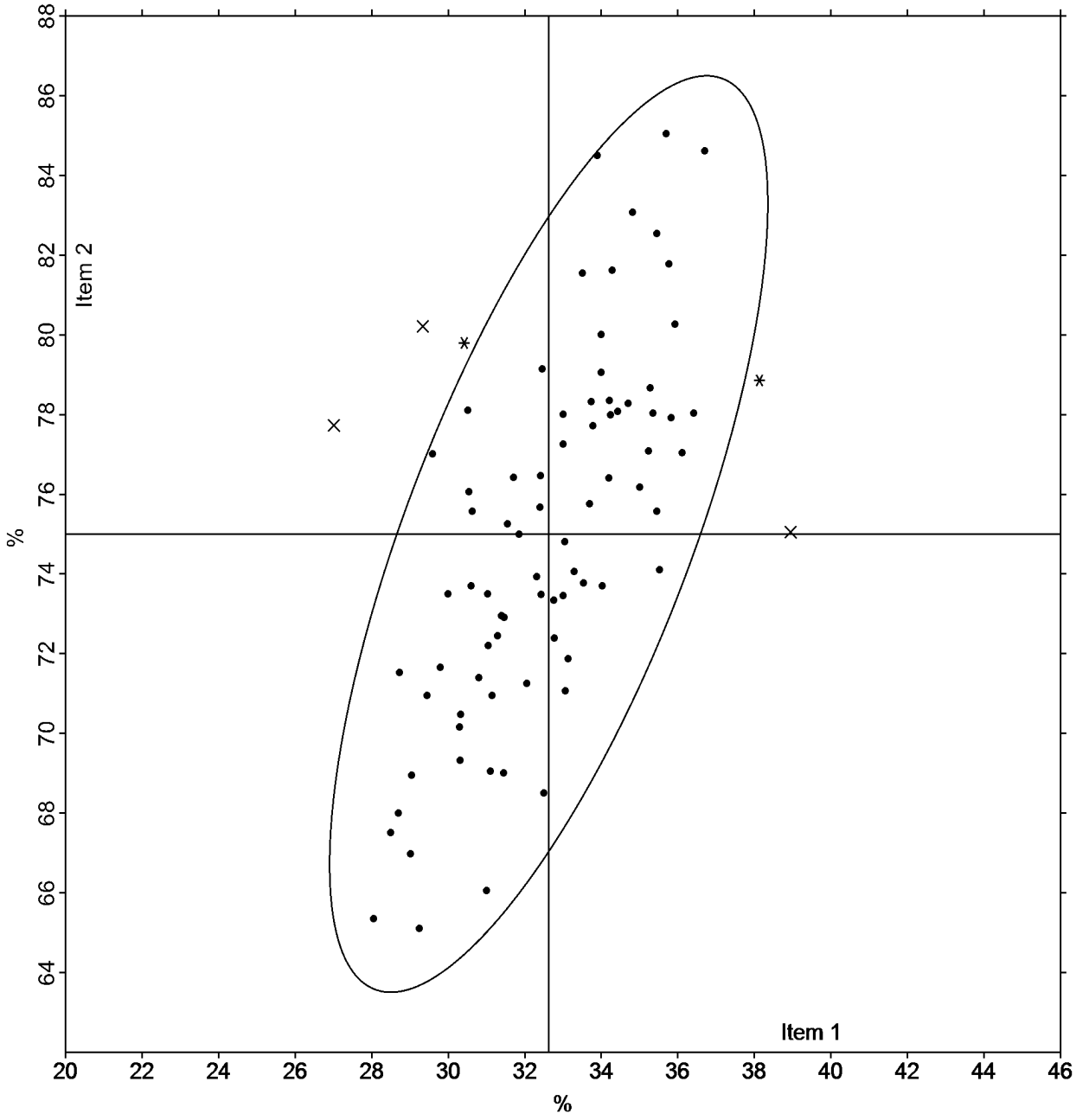
		Item 1			Item 2		
WebCode	Data Flag	Participant Mean	Difference from Grand Mean	CPV	Participant Mean	Difference from Grand Mean	CPV
YTR93H		29.80	-2.825	-1.14	71.65	-3.353	-0.69
YYGT6X		32.32	-0.305	-0.11	73.93	-1.078	-0.21
Z7CAVU		30.63	-2.000	-0.80	75.56	0.560	0.14
ZMZKHW		35.46	2.833	1.18	75.57	0.563	0.14
ZQM3ZG		32.05	-0.575	-0.22	71.25	-3.753	-0.77
ZUHT9D		33.07	0.441	0.20	71.07	-3.936	-0.81

Response Summary	Item 1	Item 2	Participants: 85
Preparation Concentration	**35%**	**79%**	
Grand Mean	32.63	75.00	
Standard Deviation	2.28	4.58	

Participants Included: 79 Participants Excluded: 5 Participants without Raw Data for both items: 1

Bivariate Control Analysis

Item 1 Grand Mean: 32.63 Item 2 Grand Mean: 75.00



*Two participants marked as outliers (X) are not 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. 20-5061: Quantitative Drug Analysis - Cocaine HCl

DATA MUST BE SUBMITTED BY **Dec. 28, 2020, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A WebCode: LWZ2EU

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 cocaine HCl samples from separate cases to be quantitatively examined. Using your laboratory's procedures, analyze each sample and report the quantitative determination of cocaine 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 cocaine HCl present in the samples.

Items Submitted (Sample Pack DQ2):
Items 1 & 2: Powdered cocaine HCl samples

1a.) What is the concentration of cocaine 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 cocaine HCl. (Results not reported in % will be excluded from statistical calculations.)

Item 1 (%)	**Item 2** (%)

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

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

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 ASCLD/LAB, 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 ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section below must be completed.)

○ This participant's data is **not** intended for submission to ASCLD/LAB, 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.
(Include ASCLD/LAB Certificate here)

A2LA Certificate No.

Step 2: Complete the Laboratory Identifying Information in its entirety

Authorized Contact Person and Title

Laboratory Name

Location (City/State)