

Review of User Check for NMAM Method 9111 (Methamphetamine on Wipes by Liquid Chromatography-Mass Spectrometry-SIM)

User check samples were prepared by the Bureau Veritas quality assurance department to be analyzed using draft NMAM method 9111. A total of twenty cotton gauze wipes (VWR cat. # 21910-107) were placed in a 50ml polypropylene centrifuge tube and spiked with methamphetamine HCL (Alltech lot# 097) and pseudoephedrine (Fluka lot# 1304310). The samples were prepared August 26, 2008. The spike levels for methamphetamine were 0.304 ug, 0.684 ug, 4.94 ug, and 15.2 ug and the pseudoephedrine was spiked at 1.027 ug. The samples were analyzed on August 21, 2008. No significant deviations were noted from the analytical procedure in NMAM method 9111.

For this analysis, the LOD (limit of detection) was 0.05 ug/wipe and the LOQ (limit of quantitation) was 0.17 ug/wipe. Methamphetamine recoveries were biased high at 129.6% and 130% for the two laboratory control spikes. No definitive cause was identified for the high recoveries although a spiking error could be the most likely source of error. Media LOD/LOQ recoveries ranged from 109.5% to 105.1% for the spike levels within the calibration range. The spiking solution was verified by preparation of vial spikes at 10 ug with resulting recoveries of 103.9% and 101.5%. Therefore, the high bias results were probably restricted to the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD). The relative percent difference (RPD) was within acceptable limits (<20%). One sample was analyzed in duplicate and was within the acceptance limits (<20%).

The table below gives the laboratory data extracted from the laboratory report for methamphetamine:

Sample ID	Spiked Amt.	Recovery Amt.	% Recovery	Ave. Recovery	RSD (%)
3	0.0 ug	ND	NA	-	-
5	0.0 ug	ND	NA	-	-
8	0.0 ug	ND	NA	-	-
15	0.0 ug	ND	NA	0 %	0
1	0.304 ug	0.315 ug	104	-	-
4	0.304ug	0.305 ug	100	-	-
14	0.304 ug	0.319 ug	105	-	-
19	0.304 ug	0.325 ug	107	104 %	3
6	0.684 ug	0.727 ug	106	-	-
10	0.684 ug	0.744 ug	109	-	-
11	0.684 ug	0.735 ug	107	-	-
16	0.684 ug	0.742 ug	108	108 %	1

7	4.94 ug	5.16 ug	104	-	-
13	4.94 ug	5.26 ug	106	-	-
17	4.94 ug	5.43 ug	110	-	-
18	4.94 ug	5.24 ug	106	107 %	3
2	15.2 ug	15.4 ug	101	-	-
9	15.2 ug	15.2 ug	100	-	-
12	15.2 ug	15.2 ug	100	-	-
20	15.2 ug	16.0 ug	105	102 %	2

The user check spike samples ranged from 0.304 ug/wipe to 15.2 ug/wipe which is 3 to 150 times the method limit of detection (LOD) of 0.1 ug/wipe and is within the method range of 0.1 ug/wipe to 100 ug/wipe. It is expected in the field to have samples in the lower part of the analytical method range. The above results show that the recovery percentages of 104%, 108%, 107%, and 102% for the four concentration levels are all acceptable. The relative standard deviation (RSD) for all test samples ranged from 1 to 3 which are excellent and all blank samples were all none detected (ND).

Overall, the method (NMAM 9111) has very few analytical steps compared to some of the other methamphetamine methods and the analytical times of less than 25 minutes is very good. This repeat user check has passed all requirements for precision and accuracy, and the method is less complex and takes less time to perform than other methamphetamine methods. Therefore, it is my recommendation that the method, NMAM 9111 (Methamphetamine on Wipes by Liquid Chromatography-Mass Spectrometry-SIM) be approved and accepted for inclusion in the NIOSH Manual of Analytical Methods (NMAM).

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