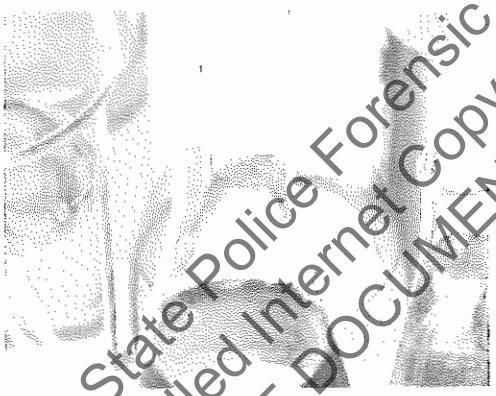
Idaho State Police
Forensic Services

Approval for Quality System Controlled Documents



Discipline/Name of Document: Controlled Substances
#10 Balance Calibration Verification Analytical Method

Revision Number: 3

Issue Date: 7/3/2007

APPROVED BY: Corinna C Ousley
Quality Manager

7/3/07
Date Signed

#10
Balance Calibration Verification
Analytical Method

1.0.0 Background and Scope

In order to ensure the integrity of the reported weights of controlled substances each laboratory within the Idaho State Police system maintains a set of weights that are used to verify the calibration of all balances and scales located in each laboratory.

2.0.0 Equipment

One set of ASTM Class 2, or better, weights. These weights must be NIST traceable and certified at the time of purchase. The documentation for the certification/calibration of the weights will be retained.

3.0.0 Procedure

Once a month each balance is to have its calibration checked (intermediate check) against a set of certified NIST traceable weights. Results are to be recorded in a log for future reference. A balance that is infrequently used, less than once a month, is required to have a calibration check immediately before the balance is used. Balances not in service are not required to have a calibration check.

3.1.0 Each balance is checked using a set of ASTM weights as reference. This set should span the expected weights of samples that will be measured on each balance. An example: for the typical top loader 1g, 100g, and 2000g weights would be sufficient. The allowable deviation from the standard weights will be 0.01 g or 0.1%, which ever is greater.

3.2.0 Each laboratory will keep a log sheet for each balance in use. The log sheet will list the balance identification, the weights used, their indicated weight, whether or not the observed weight is within the tolerance of the balance, the analyst and the date on which the check was performed.

3.3.0 Once a year an independent vendor will calibrate each balance.

3.4.0 An independent vendor will calibrate each weight set on a yearly basis.

3.5.0 The weights will be handled with gloves or tweezers to keep them clean. They will be transported and stored in their case.

4.0.0 Consequences

If a balance fails a monthly calibration check, the check is repeated. If the balance still fails then it will be taken out of service until it can be recalibrated or repaired. The balance shall be tagged indicating that it is out of service.

5.0.0 History

Revision #	Issue or review date	History	Author or Reviewer
0	4/26/02	Original Issue	D.C. Sincerbeaux
1	8/27/02	Add #	D.C. Sincerbeaux
2	5/23/03	Added to section 3.0.0 and 3.1.0	D.C Sincerbeaux
2.1	1/12/07	Added page #s, history & changed wording in 3.0.0 and 4.0.0 "shall", changed title.	D.C. Sincerbeaux
3	7/3/2007	added 3.5 and changed 2.0	D.C. Sincerbeaux

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Discipline/Name of Document: Controlled Substances
#5 Marijuana Analytical Method

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5
Marijuana
Analytical Methods

1.0.0 Background

Marijuana (Cannabis Sativa) has been used for its sedative, euphoriant and hallucinogenic properties for over 3000 years. Written references to it date back to 2700 BC. It is primarily smoked but can be taken orally. The active compound, delta-9-tetrahydrocannabinol (THC) is most concentrated in the resin that is obtained from the flowers of the female plant. It is imperative that the analyst be familiar with the current Idaho code as it pertains to the legal definition of marijuana.

2.0.0 Scope

The following analytical procedures are used to confirm the presence of marijuana in plant material and residue samples. The procedure is composed of a series of tests, none of which by themselves are specific for marijuana or THC, but taken in combination are considered specific for the presence of marijuana or its resins. GC/MS is not routinely applied to marijuana analysis but may be used and is considered specific for THC. If a plant material sample is suspected of containing a controlled substance other than marijuana then the sample will be extracted and analyzed using a GC/MS.

3.0.0 Equipment and Reagents

3.1.0 Stereomicroscope.
3.2.0 Thin layer chromatography tank and plates.
3.3.0 Aqueous Fast Blue BB solution. (a Fast Blue B salt solution may be used as a substitute)
3.4.0 ACS grade Petroleum ether, hexane, diethyl ether, methanol, toluene, and chloroform.
3.5.0 GC/MS and analytical software.

4.0.0 Solvent Extraction

4.1.0 Plant material
- 4.1.1 Place approximately 0.1g of plant material in test tube.
- 4.1.2 Cover with appropriate solvent.
- 4.1.3 Use extract for thin layer and/or modified Duquenois-Levine.
- 4.1.4 Retain small amount of unused solvent as blank.

4.2.0 Residues
- 4.2.1. Flush pipe or item(s) containing suspected residue with appropriate solvent and collect solvent in test tube (item(s) may also be swabbed).
- 4.2.2. Use extract for thin layer and/or modified Duquenois-Levine.
- 4.2.3. Retain small amount of unused solvent as blank.

5.0.0 Microscopic Examination

5.1.0 Plant material is examined using a stereo microscope for the following characteristics:

5.1.1 Cystoliths and/ or Cystolithic hairs – Small "bear claw" shaped hairs with bases of calcium carbonate. The cystoliths and hairs are located on the topside of the leaf or leaf- fragment.

5.1.2 Unicellular hairs – Fine hairs located on the underside of the leaf or leaf-fragment. **Note** Unicellular hairs are not always observed on the leaves from the budding parts of the marijuana plant.

5.2.0 Seeds are examined using a stereomicroscope for the following characteristics:

5.2.1 Veined shell.

5.2.2 Ridged edges.

5.2.3 Point on one end and dint on the end of plant attachment.

6.0.0 Thin Layer Chromatography

6.1.0 Spot a small amount of solvent extract onto a thin layer plate along side of a marijuana standard and a solvent blank.

6.2.0 Develop the plate using one or more of the following mobile phases:

6.2.1 Hexane/diethyl ether 4:1 (petroleum ether may be substituted for hexane).

6.2.2 Chloroform or Toluene.

6.3.0 Visualize by spraying the plate with Fast Blue BB salt solution.

6.4.0 Compare results of unknown to those of standard. Photocopy the plate for the case file.

7.0.0 Modified Duquenois-Levine

7.1.0 In a test tube containing a portion of the evaporated solvent extract, mix 2-10 drops of Duquenois reagent and an equal amount of concentrated HCl.

7.2.0 Let stand ½ to 3 minutes and observe color change.

7.3.0 Add chloroform.

7.4.0 Observe if the purple color transfers into chloroform layer. * Note: Transferring the solution from step 7.2.0 into a clean test tube before the addition of chloroform will decrease the color interference from chlorophyll.

7.5.0 A blank and a standard need to be run with each batch and the results recorded in the case notes.

8.0.0 Results and Reporting

A positive test shall be defined as the following:

8.1.0 Microscopic

8.1.1 Observation of cystolithic hairs on the leaf and/or the presence of characteristic seeds.

8.2.0 Thin Layer

8.2.1 Presence of a red spot with migration distance consistent with the red THC

spot of the standard.

8.2.2 Negative blank.

8.3.0 Modified Duquenois-Levine

8.2.1. A purple* color developing after the addition of the HCl (*color may very from blue to reddish purple depending on the sample).

8.2.2. Transfer of the color into the organic layer after the addition of chloroform.

A positive result shall be defined as the following:

8.4.0 Positive microscopic, single TLC system, and modified Duquenois-Levine.

8.4.1 Report using the words "contains marijuana. Schedule I".

8.5.0 Negative microscopic. Positive modified Duquenois-Levine and two positive TLC systems.

8.5.1 The conclusion should contain the words "contains, marijuana, and resins."

9.0.0 Germination

Marijuana seeds without THC are only controlled if they are fertile. The germination test should only be performed if it has been determined that the seeds do not contain THC. *Note* In determining the presence of THC, soaking the seeds for up to thirty minutes in petroleum ether /hexane, does not effect germination rates.

9.1.0 Wrap a minimum of 10, to a maximum of 100 seeds, in a moist paper towel and place in a covered container. The container is then placed in a safe dark place for 14 days.

9.2.0 Check seeds daily making sure they do not dry out. Also watch out for mold.

9.3.0 Report how many seeds sprouted as a percentage of the original total.

10.0.0 GC/MS Confirmation

10.1.0 Extract sample as in section 4.0.0

10.2.0 Run extract according to GC/MS AM along with a known standard containing THC.

10.3.0 Compare retention time and ion chromatograph of sample with THC standard.

10.4.0 Report positive results using the words "Contains marijuana. Schedule I" if cystolithic hairs or characteristic seeds were also found, otherwise use 8.5.1.

11.0 References

Identification of Marijuana, by J.I. Thornton and G.R. Nakamura
Journal Forensic Science (1972), 12, 461

12.0.0 History

Revision #	Issue or review date	History	Author or Reviewer
0	8/17/01	Original Issue	Stuart Jacobson
1	8/27/02	Scope, add #	D.C. Sincerbeaux
2	11/05/04	Small changes in 6.2.3 and 3.4.0, dropped the use of benzene. 8.2.0 red from scarlet. 8.1.0 dropped need for unicellular hairs based on Note inserted into 5.1.2. 6.1.0, 4.1.2, and 4.2.1 appropriate solvent vs. pet ether. Added 11.0 reference section.	D.C. Sincerbeaux
3	9/13/05	Added 7.5.0	D.C. Sincerbeaux
4	1/12/07	Changed name, added pg #'s	D.C. Sincerbeaux
5	7/3/2007	Changed scope, dropped 6.2.3	D.C. Sincerbeaux