



# Microgram

## *Bulletin*

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**VOL. XXXVII, NO. 11**

**NOVEMBER 2004**

**- INTELLIGENCE ALERT -**

**2,5-DIMETHOXY-4-ETHYLPHENETHYLAMINE (2C-E) ENCOUNTERED  
IN FT. PIERCE, FLORIDA AND ROYAL OAK, MICHIGAN**

The Indian River Crime Laboratory (Ft. Pierce, Florida) recently received three unmarked (and visually unremarkable) clear gelatin capsules, each containing a coarse white powder (total net mass 0.36 grams), alleged to be either 4-bromo-2,5-dimethoxyphenethylamine (also known as "2C-B" or "Nexus") or 2,5-dimethoxy-4-(n)-propylphenethylamine (also known as "2C-T-7" or "Blue Mystic"). The exhibits were submitted by the St. Lucie County Sheriff's Department in Ft. Pierce (circumstances sensitive; Ft. Pierce is located on the south-central Florida east coast, approximately midway between Cape Canaveral and West Palm Beach). Analysis by color testing, UV, and GC/MS, and comparison against a standard provided by the Toxicology Department, Landeskriminalamt Kiel, Germany indicated not 4-bromo-2,5-dimethoxyphenethylamine or 2,5-dimethoxy-4-(n)-propylphenethylamine but rather 2,5-dimethoxy-4-ethylphenethylamine (also known as "2C-E") (not quantitated, salt form not determined).

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The Michigan State Police Forensic Laboratory (Sterling Heights, Michigan) recently received a brown glass vial containing an unknown white powder (total net mass of powder 1.28 grams), suspected cocaine. The exhibit was seized by the Royal Oak Police Department from an

individual who was sent to a local hospital for an overdose, possibly from the unknown powder (Royal Oak is a northern suburb of Detroit). Analysis by GC/MS, however, indicated not cocaine but rather a compound tentatively identified as 2,5-dimethoxy-4-ethylphenethylamine (2C-E) (not quantitated, salt form not determined). The identification was tentative because no standard was available for comparison. This was the first submission of this compound to the Sterling Heights laboratory; however, other submissions have since been made to other Michigan Forensic Laboratories.

[Editor's Notes: 2C-E is one of the designer phenethylamines reported in Alexander Shulgin's book "PIHKAL". According to the Indian River Crime Laboratory analyst, based on discussions with experts around the United States, these appear to be the first appearances of 2C-E in domestic casework. The mass spectrum of 2C-E is reproduced in Figure 1, below.]

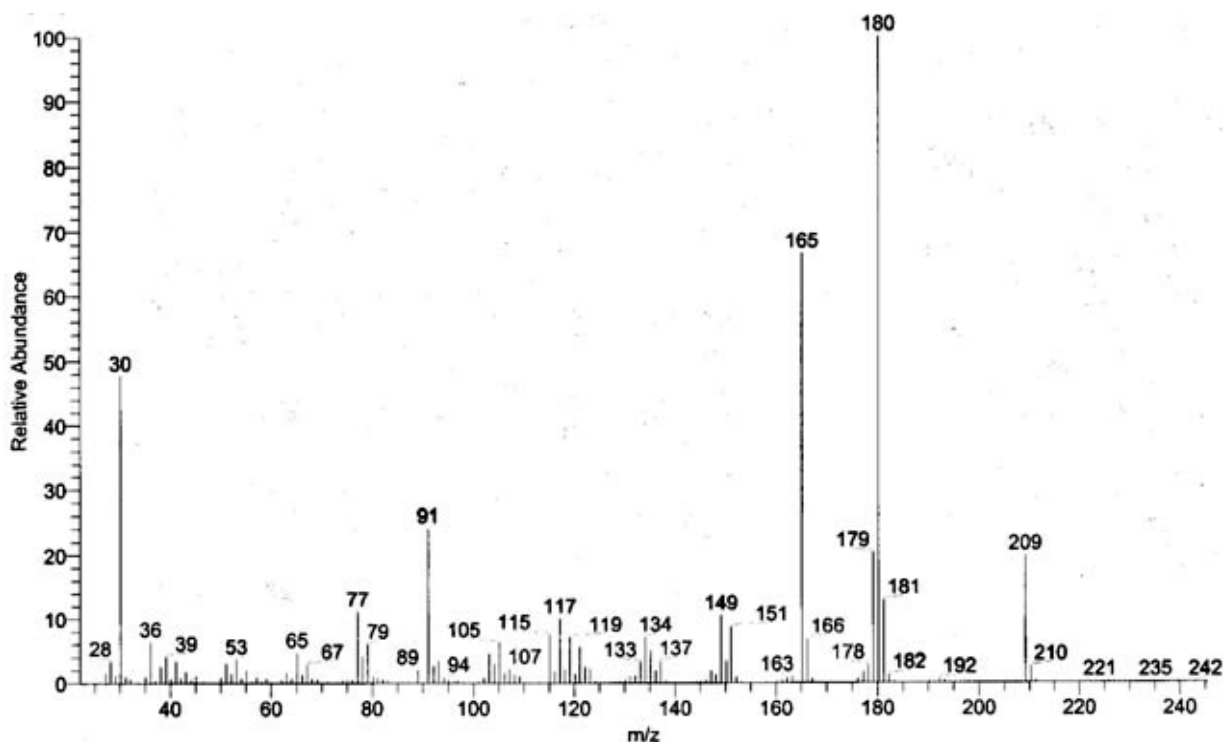


Figure 1 - Mass Spectrum of 2,5-Dimethoxy-4-ethylphenethylamine.

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**- INTELLIGENCE ALERT -**

**UNIQUE FORMULATION OF HASHISH IN JUNCTION CITY, KANSAS**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a polydrug submission consisting of 21 kilograms of cocaine, 149 kilograms of marijuana, and 55.6 grams of a dry, very fine ground, brown powder packaged in a plastic bag, suspected marijuana residue or hashish

(see a small aliquot in Photo 1). The exhibits were originally seized by DEA Agents in Junction City, Kansas and were submitted to the laboratory after a controlled delivery in Newport News, Virginia. The most intriguing characteristics of the powder were its dryness and fineness. Microscopic examination revealed no plant morphology. Analysis by TLC, Duquenois-Levine, and GC/MS confirmed that the sample contained predominantly  $\Delta^9$ -tetrahydrocannabinol (THC), with traces of cannabinol and cannabidiol. Quantitation was not performed; however, the TLC (with spraying by Fast Blue BB after development) and the Duquenois-Levine test resulted in extremely bright and vivid colors. Hashish is seldom encountered at the laboratory, and this formulation is thought to have been unique.

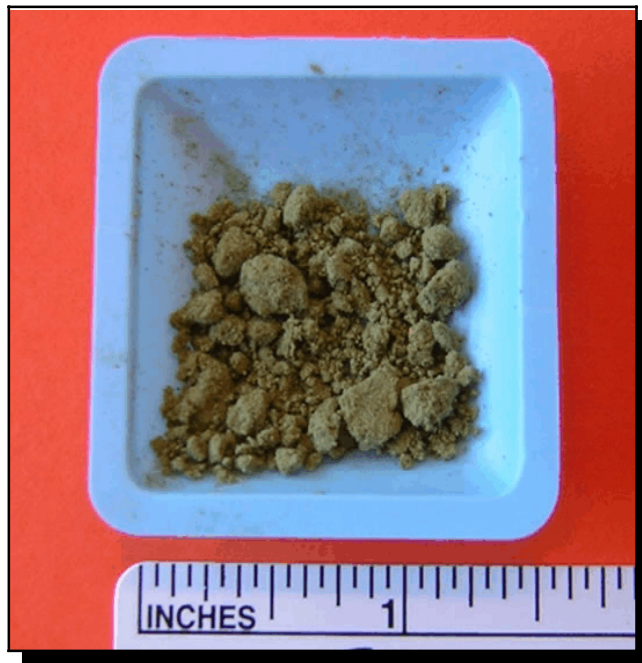


Photo 1

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**- INTELLIGENCE ALERT -**

**DIMETHYLAMPHETAMINE IN APPARENT "ICE" FORM  
NEAR MEDFORD, OREGON**

The DEA Western Laboratory (San Francisco, California) recently received a submission consisting of two clear plastic bags containing a crystalline substance (total net mass 1,355 grams), suspected "Ice" methamphetamine (see Photo 2). The exhibit was seized from a defendant's vehicle (during an arrest) near Medford, Oregon by Agents from the DEA Medford Resident Office. Analysis of the substance by GC/MS, GC-IRD, polarimetry, and TPC derivatization, however, indicated not d-methamphetamine hydrochloride > 80 percent (that is, "Ice"), but rather a mixture of dimethyl sulfone, d-methamphetamine (salt undetermined, present at less than 1 percent), and d-N,N-dimethylamphetamine (salt undetermined). The dimethylamphetamine was not quantitated, but was the major component. The laboratory previously encountered exhibits of dimethylamphetamine in

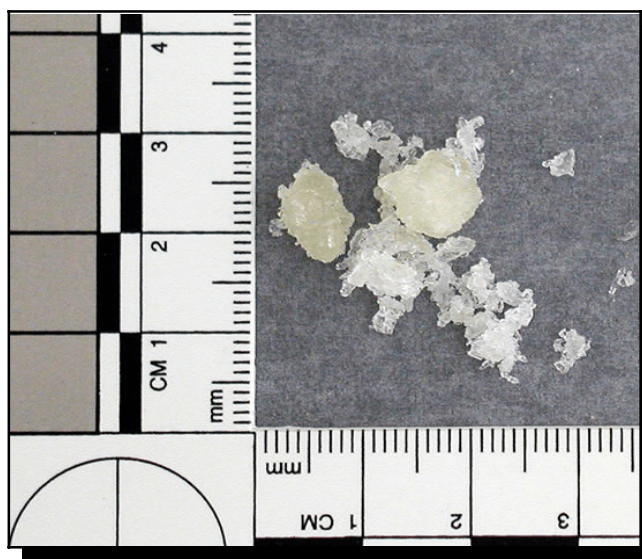


Photo 2

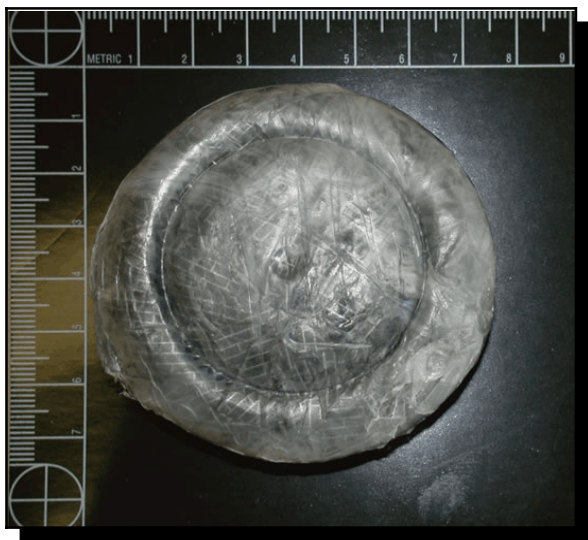
apparent “Ice”-like form, from seizures made in Honolulu in 1994 (but none since then). Subsequent to this latest seizure, another seizure of dimethylamphetamine/dimethyl sulfone/methamphetamine was made in Sacramento, California; however, that exhibit was a clumpy, white powder.

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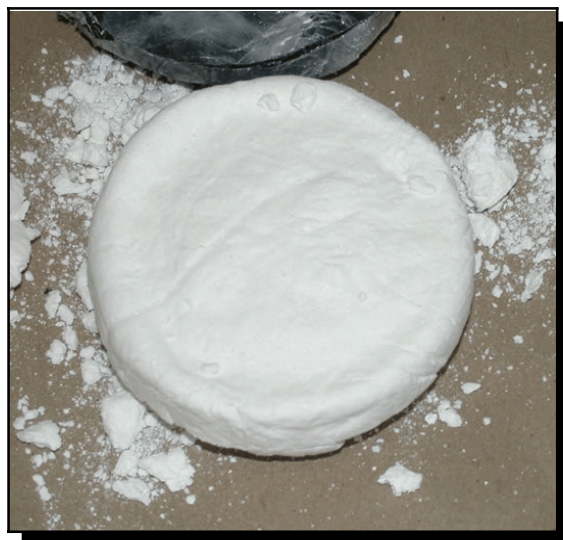
**- INTELLIGENCE ALERT -**

**UNUSUALLY PACKAGED DISKS OF COCAINE IN MIAMI, FLORIDA**

The DEA North Central Laboratory (Chicago, Illinois) recently received twelve circular packages each containing a circular disk of a compressed white powder, suspected cocaine. The exhibits were initially seized at the Customs and Border Protection Foreign Mail Unit in Miami, Florida and were submitted to the laboratory after a controlled delivery by the Bureau of Immigration and Customs Enforcement in the Chicago area (the original source of the packages was not reported). Each package was approximately 7.5 cm in diameter and approximately 3 cm at its thickest dimension. The packaging for each circular disk consisted of a knotted plastic bag wrapped in carbon paper which was further wrapped with parafilm (see Photos 3 and 4). Analysis of the powder (total net mass 844.2 grams) by FTIR and GC/MS confirmed 61 percent cocaine hydrochloride, with associated cocaine alkaloids and undetermined methanol and chloroform insolubles. This is the laboratory’s first encounter with disks of cocaine.



**Photo 3**



**Photo 4**

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**- INTELLIGENCE ALERT -**

**INCREASE IN REPORTING OF MARIJUANA DERIVATIVES**

[From the NDIC *Narcotics Digest Weekly* 2004;3(41):1  
Unclassified, Reprinted with Permission.]

Law enforcement reporting indicates an increase in the availability of marijuana derivatives such as cannabis resin and hashish. For example, in August 2004 local law enforcement in Pembroke Pines, Florida, reported the availability of resin "balls" (small, approximately one-quarter-inch pieces of resin that had been scraped from cannabis plant buds). When field tested, the resin balls indicated a very high THC (delta-9-tetrahydrocannabinol) content. The potential for increased availability of marijuana derivatives exists in any area of the United States because they can be relatively simple to produce. Normally, a fine resin powder is created by separating the resinous bulbs (known as trichomes or crystals) from buds or leaves of cannabis plants. Usually this is accomplished by sieving methods, cold-water extraction, or chemical extraction. The resulting resin powder is commonly called kif (also spelled kef, kief, or keef).

Essentially, kif is hashish before it is pressed. Kif is sprinkled on tobacco or marijuana and smoked as a cigarette or joint and sometimes is inserted in gelatin capsules for oral consumption. Hashish is made by pressing the kif, either by hand or hydraulically, into balls, slabs, or other shapes; it can be light brown to black in color, and the texture ranges from soft and pliable to very hard. Use typically involves smoking pieces of hashish in a pipe or joint, inhaling the vapors emitted from hashish placed on a knife that is heated, and eating foods cooked or baked with hashish (usually first cooked in butter because hashish, as well as marijuana, is fat soluble). Hashish is considered to produce a very strong high. Its potency, as with marijuana, varies widely and has ranged from less than 1 to more than 50 percent; the average THC content of hashish samples tested by the Potency Monitoring Project between May and August 2004 was 6.38 percent.

NDIC Comment: The increased popularity of and demand for higher potency marijuana in the United States likely will result in some increase in the availability of marijuana derivatives, as marijuana users seeking a strong high experiment with products like hashish, and producers and distributors seeking higher profits learn to maximize the earning potential of their cannabis plants. Because bud-type marijuana (sinsemilla) is now in great demand in the United States, there are high profits to be made from harvesting and selling only the buds, while the rest of the plant could be considered trash. Yet some amount of resin also is found on the less potent leaves, and this can be collected to produce hashish that ultimately has a much higher potency than the leaves themselves and therefore a marketable value--a so-called trash-to-stash transformation. Instructions for hash production are readily accessible on the Internet and in print media, and the introduction of equipment such as water hashmaking kits has facilitated home production. Some dealers collect resin off the buds, sell the kif, and also deceitfully sell the now less potent bud. Such fraudulent dealing could lead to sporadic incidents of retribution and violence against the dealers.

Law enforcement reporting on the use of marijuana derivatives in the United States has often

been limited to areas known to be significant markets for higher potency marijuana such as California and south Florida (such as in the incident above), although it could occur anywhere in the United States. For instance, in late July 2004 investigators with the Pennsylvania State Police in south central Pennsylvania purchased a bag of kif, which at that time had never been seen in the area.

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**- INTELLIGENCE ALERT -**

**COMMINGLED SHIPMENT OF CANADA-PRODUCED MARIJUANA AND MDMA  
SEIZED IN BIRCH BAY, WASHINGTON**

[From the NDIC *Narcotics Digest Weekly* 2004;3(42):2  
Unclassified, Reprinted with Permission.]

Officials from ICE and U.S. Coast Guard Investigative Services (CGIS) report seizing 213 pounds of Canada-produced marijuana as well as 444 tablets of MDMA that were concealed in one of the seized packages of marijuana. On June 2, 2004, ICE and CGIS agents seized the 213 pounds of marijuana and arrested three individuals--two Canadian citizens and one U.S. citizen--on charges of smuggling marijuana from British Columbia, Canada, to the United States. Agents allege that the Canadian suspects used a kayak to transport the marijuana via Semiahmoo Bay to Birch Bay, Washington, where they docked the kayak behind a house located on the bay. The suspects then carried the kayak with the marijuana concealed inside into the house, where they repackaged the marijuana. Agents observed the suspects carrying six boxes from the house to a pickup truck that was parked by the front door and was owned by the third suspect. Agents obtained consent to search the truck and found vacuum-sealed packages of marijuana labeled with letters "A" through "K" in the boxes. The packages contained either one resealable plastic bag covered in vacuum-sealed bags or what appeared to be two resealable plastic bags vacuum-sealed together. On September 27, 2004, ICE agents reweighed the marijuana to determine the appropriate sentence under federal sentencing guidelines. When ICE agents opened the package labeled "E," they discovered a resealable plastic bag containing 444 tablets of MDMA located between two resealable plastic bags containing marijuana. Until the vacuum packaging was removed, the marijuana had obscured the MDMA from view. Agents opened the rest of the packages, but no drugs other than marijuana were found.

NDIC Comment: This seizure is significant because, according to the CGIS, this is the first discovery of contraband concealed within contraband in the Blaine area. While significant amounts of Canadian-produced marijuana have been smuggled through and between ports of entry (POEs) located near Blaine for years, more MDMA is now being smuggled through the area. According to the U.S. Bureau of Customs and Border Protection (CBP), the number of MDMA tablets seized at the Blaine POE has increased from 33,813 in 2002 to 41,132 in 2003. Thus far, 108,358 tablets have been seized between January 1, 2004, and July 19, 2004. Powdered MDMA also is being seized at the Blaine POE. According to CBP, a total of 84.00 kilograms of powdered MDMA was seized in 2002, a total of 1.84 kilograms in 2003, and a total of 9.77 kilograms between January 1, 2004, and July 19, 2004.

**- INTELLIGENCE BRIEF -**

**VIETNAMESE GROUP'S SOPHISTICATED CANNABIS GROW FOUND  
IN UPSCALE NEIGHBORHOOD IN SOUTHTON  
AND BURLINGTON, CONNECTICUT**

[From the NDIC *Narcotics Digest Weekly* 2004;3(40):2  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On September 15, 2004, officers with the Southington Police Department and the Connecticut State Police Statewide Narcotics Task Force arrested five members of a Vietnamese criminal group for operating three indoor cannabis grows in central Connecticut. Officers discovered the first cannabis grow after being called to a house in an upscale neighborhood of Southington for a report of a disturbance and smoke coming from the structure. Upon their arrival, a 47-year-old Vietnamese man holding two cannabis plants approached the officers, apparently unaware that they were law enforcement officers. The man indicated to officers that he had been assaulted by another man inside the home. Officers detained the man and then examined the inside of the house, where they discovered a 52-year-old Vietnamese man as well as a third man who attempted to flee out the back of the home. Officers also found 992 cannabis plants inside the house, which was valued at over \$400,000. The grow operation had a sophisticated lighting and irrigation system encompassing the basement and upper floor of the house. The only furniture in the home were two mattresses. An illegal tap into the city's underground electrical supply bypassed the home's electrical meter. Officers believe that the hookup was accomplished while the wires were hot, indicating that sophisticated electrical skills would have been needed. Officers determined that a small electrical fire had caused the smoke that alerted neighbors who called the police. While officers secured the scene, a Vietnamese female drove up in a private vehicle with Florida license plates and attempted to enter the house. The woman consented to a search of her vehicle, which revealed receipts for equipment from Canada that is typically used in cannabis cultivation. Officers obtained and executed a search warrant for her residence, also in Southington, where they found another indoor cannabis grow as well as two Vietnamese men, aged 25 and 52, who were loading 83 cannabis plants into a commercial truck. A search warrant was obtained for the men's Burlington residence, where a third grow and an additional 225 cannabis plants were seized. The five individuals were arrested and charged with possession of marijuana over 1 kilogram with intent to sell, conspiracy in operating a drug factory, conspiracy to possess marijuana, and cultivation of marijuana. Two of the men also were charged with disorderly conduct, threatening, and assault. DEA provided additional manpower and assistance during the investigation.

NDIC Comment: Law enforcement reporting indicates that Vietnamese criminal groups are establishing sophisticated indoor cannabis cultivation sites in the New England region. A similar incident occurred in West Haven in May 2004 when DEA agents seized 600 cannabis plants from the basement of a three-story building. The building was occupied by members of a Vietnamese criminal group, and evidence suggested that members of the group had planned to expand their operation to other floors in the building. This group also illegally bypassed an

electrical meter. Seized Canadian currency and deposit slips indicated a large number of small deposits to a bank in Vancouver (BC) Canada.

Some of these cultivation sites likely are connected to Vietnamese criminal groups operating in Canada. Canadian law enforcement agencies report that Vietnamese criminal groups operating sophisticated indoor cannabis grows are common, particularly in urban areas within the provinces of Ontario and British Columbia. Many times these groups will purchase or lease large (over 2,000 square feet) homes that cost \$200,000 to \$500,000 in Canadian currency. The groups reportedly maintain renovation crews that make structural changes to the home--installing heating and venting systems and bypassing electrical meters. Sometimes the groups look for homes that are under construction to allow workmen to make the modifications more easily. After setting up a grow inside the home, recent immigrants often are paid to live in the house to avoid suspicion.

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## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

1. Blachut D, Danikiewicz W, Olejnik M, Czarnocki Z. **Electron ionization mass spectrometry as a tool for the investigation of the ortho effect in fragmentation of some Schiff bases derived from amphetamine analogs.** *Journal of Mass Spectrometry* 2004;39(8):966. [Editor's Notes: Presents and discusses the fragmentation patterns of Schiff bases derived from 2-, 3-, and 4-methoxyamphetamine. Contact: Faculty of Chemistry, Warsaw University, Warsaw 02-093, Pol.]
2. Carpentier C, Griffiths P, King LA. **An overview of cannabis potency in Europe.** Report EMCDDA Insights 2004:1. [Editor's Notes: Presents the title study, and discusses the results versus the comparable data for the United States and Australia/New Zealand. Contact: 27 Ivar Gardens, Basingstoke, Hampshire, RG24 8YD, UK.]
3. Gartsev NA, Semeikin NP, Sharshin YA, Pomozov VV, Nedorezov AV, Nikiforov AA. **Detector for detection of explosives and drugs.** RU 2234695 C1 20 Aug 2004. CLASS: ICM: G01N024-00. APPLICATION: RU 2003-106186 6 Mar 2003. [Editor's Notes: Appears to be based on nuclear quadrupole resonance detection. Drugs not specified. This patent is written in Russian. Contact: Russia (no further addressing information was provided).]
4. Hida M, Mitsui T, Tsuge S, Ohtani H. **Rapid and sensitive determination of morphine in street opium samples by thermal desorption gas chromatography using a microfurnacepyrolyzer.** *Journal of Separation Science* 2004;27(12):1030. [Editor's Notes:



- Presents the title analysis. Contact: Criminal Investigation Lab., Aichi Prefectural Police HDQS, Nagoya, Aichi 460-8502, Japan.]
5. Hida M, Satoh M, Mitsui T. **Detection of trace methamphetamine in dimethylamphetamine hydrochloride as stimulant material.** *Bunseki Kagaku* 2004;53(8):847. [Editor's Notes: A study to determine whether trace methamphetamine in a dimethylamphetamine sample is an artifact or an actual impurity. This article is written in Japanese. Contact: Criminal Investigation Lab., Aichi Prefectural Police HDQS, Nagoya, Aichi 460-8502, Japan.]
  6. Koelliker S, Oehme M. **Structure elucidation of nanogram quantities of unknown designer drugs based on phenylalkylamine derivates by ion trap multiple mass spectrometry.** *Analytical and Bioanalytical Chemistry* 2004;378(5):1294. [Editor's Notes: Presents the use of HPLC-multiple mass spectrometry on 55 phenylalkylamines (focus is on compounds in European ecstasy tablets). Contact: Organic Analytical Chemistry, University of Basel, 4057 Basel, Switz.]
  7. Poklis A. **Propoxyphene: Still popular after five decades of use.** *Clinical and Forensic Toxicology News* 2004:5. [Editor's Notes: An overview of the title compound. Contact: Dept. of Chemistry and Forensic Science, Virginia Commonwealth University, Richmond, VA (zip code not provided).]
  8. Puetz M, Huhn C, Dahlenburg R, Pyell U. **Determination of beta-carboline alkaloids and tryptamines in Ayahuasca and plant drugs using MEKC-UV-LIF.** *GTFCh - Symposium: Ausgewaehlte Aspekte der Forensischen Toxikologie, Beitrage zum Symposium der Gesellschaft fuer Toxikologische und Forensische Chemie, 13th, Mosbach, Germany, Apr. 3-5, 2003* 2003:275. [Editor's Notes: Presents the title analysis. Also includes analysis of methanolic extracts of *Banisteriopsis caapi* and *Peganum harmala*. Contact: Fachbereich KT 34 (Toxikologie), Bundeskriminalamt, D-65173 Wiesbaden, Germany.]
  9. Zoppi U, Skopec Z, Skopec J, Jones G, Fink D, Hua Q, Jacobsen G, Tuniz C, Williams A. **Forensic applications of C-14 bomb-pulse dating.** *Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms* 2004:223. [Editor's Notes: A minor review of the title technique. Includes the application to establishing the time of harvest of heroin and opium, and discusses the potential of the technique for profiling illicit drugs deriving from natural sources. Contact: ANSTO - Environment, PMB 1, Menai NSW 2234, Australia.]

#### **Additional Reference of Possible Interest:**

1. Kalasinsky KS, Hugel J, Kish SJ. **Use of MDA (the "Love Drug") and methamphetamine in Toronto by unsuspecting users of ecstasy.** *Journal of Forensic Sciences* 2004;49(5):1106. [Editor's Notes: An overview of the use of alleged MDMA tablets containing mixed and/or alternative drugs; focus is biological/toxicological. Contact: stephen\_kish -at- camh.net .]
2. Meier AW, Liu RH. **Forensic applications of isotope ratio mass spectrometry.** *Advances in Forensic Applications of Mass Spectrometry* 2004:149 (Chapter 4). [Editor's Notes: An overview and review. Appears to focus on biological/toxicological forensic applications (not clear in the abstract). This is a CRC Press text. Contact: No contact information was provided in the abstract.]

3. Shao X, Wang G, Wang S, Su Q. **Extraction of mass spectra and chromatographic profiles from overlapping GC/MS signals with background.** *Analytical Chemistry* 2004;76(17):5143. [Editor's Notes: Presents the title study. The authors indicate that the presented methodology is better than the SIMPLISMA technique. Contact: xshao -at- ustc.edu.cn .]

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 7 - 11, 2005  
May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

**1. Title: AAFS 57th Annual Meeting**

(Fourth Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21 - 26, 2005

**Location:** New Orleans, LA

**Contact Information:** See Website

**Website:** [www.aafs.org](http://www.aafs.org)

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All digital evidence laboratories must operate a secure storage system that maintains the chain of custody for every piece of evidence. Small and/or part-time digital evidence operations may keep their evidence in a locked room or safe. Typically, there is minimal paperwork or external oversight for such programs. Larger operations may receive and handle evidence by adhering to the existing evidence handling policies and procedures of their parent department or crime laboratory. These latter, larger programs usually have a series of steps (and people) to receive, package, and check out evidence. Redundant evidence tracking systems (often a manual and electronic tracking system operating in parallel) are not uncommon in such organizations. Currently, a few law enforcement organizations operate dedicated digital evidence-only storage areas or vaults. These usually conform to the existing general evidence policies and procedures of the parent organization. However, there may be some unique functions in a digital evidence vault, such as a data archive that contains hard drive backups and/or copies of completed examination findings. Other digital evidence “vaults” may actually be entirely electronic, consisting of a Storage Area Network (SAN) computer

system that holds copies of unanalyzed and analyzed evidence. Regardless of the specific system in use, however, it is almost always an organization requirement - and an excellent “best practice” - that the entire contents of the evidence storage area or vault be periodically audited to verify the vault’s contents and ensure the integrity of the chain of custody records.

### **Audit Scope**

Digital evidence audit policies should: 1) define the objectives of the audit process; 2) enumerate the procedures required to conduct an audit; and 3) list the circumstances that trigger an audit. In addition, there must be policies to report any deficiencies uncovered through an audit, and to document their remediation.

### **Evidence Audit Purpose**

Audits of digital evidence secure storage should, at a minimum, ensure that all evidence is accounted for. Additionally, supporting examination or backup examination material must also be accounted for. Examples include all archive evidence (if any exists), supporting case folders, and manual and automated supporting evidence transaction information. The scope of the audit can be expanded to include reviews of evidence storage

security documentation such as alarm logs, key or proximity card accountability, door and lock box combination access, and manual and/or automated evidence record keeping system security.

A digital evidence audit should be conducted by personnel familiar with the operation, but the auditors should not have had any immediate operational responsibility for the evidence storage functions. The audit team must be (or become) familiar with the current organizational policies and procedures. Verification of the evidence handling and storage policies and procedures, prior to commencement of the audit, should be made with both the Laboratory Director and the Quality Assurance Manager. Smaller organizations may have to use an evidence custodian as an assistant if independent qualified personnel do not exist. However, it is critical that the senior official or team leader of the audit not be an evidence custodian or anyone else who has had unsupervised access to the vault during the period that the audit covers.

### **Audit Timing and Need**

Generally, evidence audits should be conducted at least annually or anytime that the personnel who have access to the evidence storage area changes.

This includes adding a new member with access, or the removal, reassignment, or retirement of any individual who had access.

### **Primary Audit Goals**

Audits of digital evidence vaults should use multiple comparisons to verify that the contents are present and/or properly accounted for. Some classical audit checks include: 1) comparison of the manual and automated evidence storage and evidence check-out records; 2) verification that the evidence objects are present in the vault, in the custody of the court, or in the possession of an examiner; 3) comparison of the evidence information in the examiner's case file with the evidence vault records; and 4) comparison of the evidence information within the case folder's forms or work sheets with the examiner's hand written or typed examination notes.

### **Secondary Audit Goals**

Secondary audit objectives may include: 1) a review of evidence destruction and examination folder retention records; 2) a review of internal monthly or quarterly evidence quality control checks; 3) verification that the evidence custodian has successfully completed a qualification test and participated in all required in-service training requirements; and 4) interviews of the digital evidence practitioners or laboratory staff, and assessment of their level of familiarity with the organization's evidence handling policies.

### **Tertiary Audit Goals**

Tertiary audit objectives may include a review of the practitioner's compliance with maintaining chains of custody. This could include a lunch-time or after-hours inspection of the work areas for unsecured evidence or case folders (i.e., is the evidence secured in accordance with the organization's written policies?) It is also useful to determine if non-laboratory personnel can access the work and evidence storage areas. Are cleaning crews, maintenance personnel, or security officials allowed unsupervised access? If access must be supervised (as specified in the organization's policy manual), is supervision actually being performed?

The audit team leader should provide a written report at the conclusion of the audit. The audit report should document audit actions taken, significant findings, and provide corrective action recommendations.

### **Conclusion**

The failure to maintain proper chains of custody, or the misplacement, loss, or improper destruction of evidence, are all very serious and unacceptable errors. The regular use of aggressive audits provides assurance that any problems are detected early, and corrected. Effective evidence audits should consist of multiple and independent verifications. Audits may consist of complete inspections, or use a sampling technique. The former is preferred because of the serious consequences of any significant problem(s) for a law enforcement organization.

Private sector digital forensic laboratories should adhere to the same standards as law enforcement organizations, since corporate reputations and follow-on government prosecutions are both inextricably tied to a solid chain of custody and proper evidence handling.

Questions or comments?

Email: Michael.J.Phelan -at- usdoj.gov