

Microgram

Bulletin

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FEBRUARY 2004

- INTELLIGENCE ALERT -

**USE OF TAR AS A SMUGGLING AID ENCOUNTERED
IN SAN DIEGO, CALIFORNIA**

In mid-2003, a multi-agency task force seized more than three tons of marijuana at a house in San Diego, California. The marijuana was wrapped in plastic that had been coated with grease, then packaged in cardboard boxes that had a thick, soft, very dark brown-black paint coated on the inside surfaces of the boxes (see Photo 1). Intelligence suggested that the coating was a lead-based paint, the alleged purpose of which was to prevent X-ray detection of the contents. A complete analysis was conducted by the DEA Southwest Laboratory (Vista, California) by solubility testing, high-temperature GC, FT-IR (ATR), and NMR. The coating was insoluble in water but very soluble in either chloroform or pet ether. The GC and



Photo 1

NMR analyses indicated high molecular weight alkanes (C-30 and greater), which was supported by the FT-IR (ATR) analysis (see Figure 1). The collective results suggested a hydrocarbon-based tar. Comparison with commercial products indicated that the coating was actually emulsified asphalt, used to seal driveways or roofs, etc. The material was transparent to X-rays.

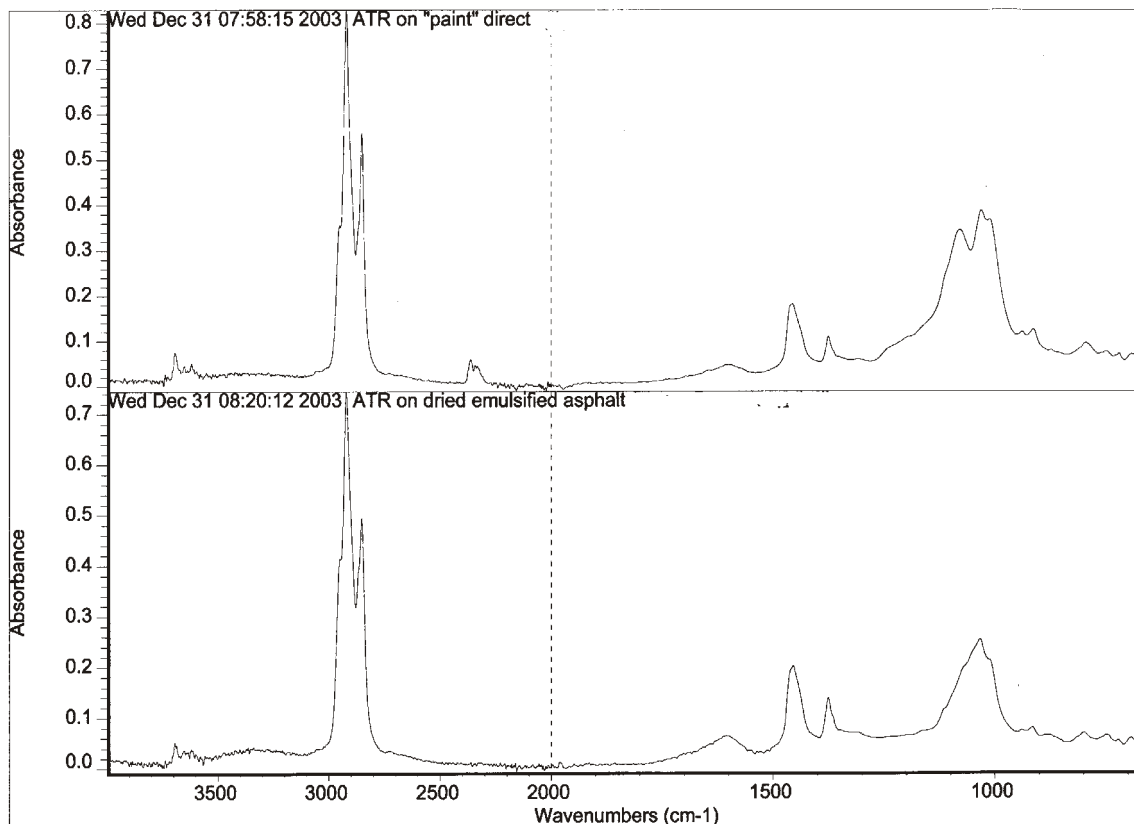


Figure 1 - Top Trace, “Paint”; Bottom Trace, Commercial Asphalt

[Editor’s Notes: This technique was first reported in the October 23, 2003 issue of the *Drug Enforcement Report* (published by PaceCom Incorporated). According to the report, smugglers have used the coating in numerous drug smuggling efforts.]

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- INTELLIGENCE ALERT -

**“STONERS ‘TAINTED TRUFFLE’” CANDY BARS SEIZED
IN BECKHAM COUNTY, OKLAHOMA**

The Oklahoma State Bureau of Investigations Central Drug Lab (Oklahoma City, Oklahoma) recently received an unusual case that included exhibits of marijuana, methamphetamine, and what appeared at first glance to be an imitation “Snickers” brand candy bar with a wrapper labelled “STONERS Tainted Truffles” (see Photo 2, next page). The wrapper labelling also included a tiny marijuana leaf-based logo, and a consumer warning “For Medicinal Use Only”.

The exhibits had been mailed to Oklahoma from southern California (sending location not further specified), and were seized by a Drug Task Force officer in Beckham County, Oklahoma (a rural area in the western part of the state), in cooperation with the U.S. Postal Service. At the time of submission, it was unknown if the candy bar actually contained any controlled substances. The bar was similar in appearance, size, and apparent makeup to a regular Snickers candy bar (see Photo 3; dimensions 10 x 2.5 x 2.0 centimeters, total net mass 62.9 grams). Analysis by GC and GC/MS confirmed tetrahydrocannabinol (THC) (quantitation not performed). This was the first submission of this type of exhibit to the laboratory.



Photo 2



Photo 3

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- INTELLIGENCE ALERT -

**WOODEN PICTURE FRAMES CONTAINING COCAINE HCl
IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received a submission consisting of seven brown, wooden picture frames which included plastic bags containing white powder hidden within internal cavities, suspected cocaine (see Photo 4). The frames (dimensions 24 x 18 x 1.5 centimeters) had been mailed via Federal Express, and were seized by the DEA Miami Field Division personnel at the U.S. Customs Foreign Mail Facility in Miami. Each frame had a different inscription in Spanish, for example "Para Alguien muy Especial" ("For Someone Very Special"). Analysis of the powder (total net weight 948.9 grams) by GC-FID, GC/MS, and IR confirmed 97 percent cocaine hydrochloride. This was the first submission of this type to the laboratory.



Photo 4

- INTELLIGENCE ALERT -

**CHRISTMAS TREE SKIRTS CONTAINING HEROIN
IN NORTHERN NEW JERSEY**

The DEA Northeast Laboratory (New York, New York) recently received a submission from the Immigration and Customs Enforcement, Newark, New Jersey Office, consisting of a Christmas Tree Skirt (see Photo 5), suspected to contain heroin. The skirt (diameter approximately 36 inches) was initially seized at the U.S. Post Office's Foreign Mail Facility in Miami, Florida and was originally mailed from Colombia. It was submitted to the Northeast Laboratory after a controlled delivery to a northern New Jersey locale (exact location withheld). Upon examination, it was determined that the skirt contained a dark, clay-like substance concealed between the back lining and the embroidered surface layer, total net mass 431.7 grams. Analysis by GC-FID, GC/MS and FT-IR/Microscope confirmed 71 percent heroin hydrochloride, cut with lidocaine. This was the laboratory's first encounter with this smuggling technique.



Photo 5

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- INTELLIGENCE ALERT -

**BODY-PACKED MARIJUANA AT THE FEDERAL PENITENTIARY
IN FORREST CITY, ARKANSAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of seven body-passed balloons containing suspected marijuana (see Photo 6). The exhibits were submitted by the Federal Bureau of Investigation, and were seized from an inmate incarcerated at the Federal Penitentiary at Forrest City, Arkansas. The inmate was observed eating suspicious items provided to him by his wife during a visitation. The items were eventually recovered from the defendant after he was isolated in a dry cell and placed under observation. Analysis of the plant material from the balloons (total net mass 3.9 grams) by microscopic examination, modified Duquenois-Levine color test, and GC/MS confirmed tetrahydrocannabinol and marijuana (THC content not quantitated). This was the first exhibit of this type submitted to the Laboratory.

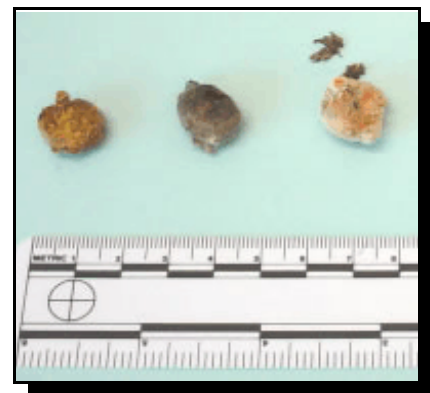


Photo 6

- INTELLIGENCE ALERT -

**METHAMPHETAMINE COLORED WITH SIDEWALK CHALK
IN MADERA COUNTY, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(2):1
Unclassified, Reprinted with Permission.]

Officials with the Madera County (CA) Narcotic Enforcement Team (MADNET) report that methamphetamine producers have begun using colored sidewalk chalk to color powdered methamphetamine. Some Mexican nationals are operating large methamphetamine laboratories in the Central Valley area of California. They produce powdered methamphetamine, transport it to stash sites, cut it with methylsulfonylmethane (MSM), color it by mixing the drug with ground-up colored chalk, and package it for distribution. They use blue, green, red, and yellow chalk to color the methamphetamine, often providing certain colors of methamphetamine to specific distributors. MADNET officials believe that these traffickers color methamphetamine to appeal to methamphetamine users who believe that certain colors have a higher purity than other colors.

NDIC Comment: It is unusual for Mexican nationals operating large methamphetamine laboratories to color the methamphetamine they produce. Mexican nationals who operate large methamphetamine laboratories typically do not deliberately color the drug; some independent methamphetamine producers who operate small laboratories do, however, color their methamphetamine. Colored methamphetamine typically is the result of using pseudoephedrine tablets with a colored coating (usually red) and not washing the color out. However, methamphetamine has been colored by adding food coloring. The use of colored chalk is a new method of coloring methamphetamine in the Central Valley area and is not typical of large methamphetamine laboratories.

[Editor's Additional Notes: The use of chalk as a cutting agent would be extremely hazardous to users who inject methamphetamine. Intravenous injection of particulate matter can cause blockages of smaller blood vessels, leading to ischemia (mechanical obstruction of blood flow), cell death, and gangrene.]

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- INTELLIGENCE BRIEF -

***PARA*-METHOXYAMPHETAMINE AND *PARA*-METHOXYMETHAMPHETAMINE
IN CECIL COUNTY, MARYLAND**

The Maryland State Police Forensic Sciences Division (Pikesville, Maryland) recently received a submission of forty-two tablets and fifty-eight gel capsules, suspected Ecstasy. The exhibits were seized pursuant to a warrant search at an apartment in Cecil County by the North East Drug Task Force (consisting of members of the Maryland State Police and the Cecil County's Sheriff's Office). The tablets were round (3/8ths inch diameter), light purple, fragile, and had no

logo (see Photo 7); total net mass not determined. Analysis by color testing (Marquis - red), FT-IR and GC/MS, however, indicated not MDMA but rather *para*-methoxymethamphetamine (PMMA), cut with aspirin and ephedrine (aspirin and ephedrine not confirmed, quantitation of PMMA not performed). The capsules were clear, had no logo or markings, contained an off-white powder, and weighed approximately 100 milligrams each (see Photo 8). Analysis of the powder by UV, FT-IR, and GC/MS, however, indicated not MDMA but rather *para*-methoxyamphetamine (PMA) (quantitation not performed). These exhibits are believed to be the Laboratory's first encounters with both drugs.



Photo 7



Photo 8

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- INTELLIGENCE BRIEF -

**ECSTASY MIMIC TABLETS CONTAINING METHAMPHETAMINE
AND LIDOCAINE IN ERIE, PENNSYLVANIA**

The Pennsylvania State Police Erie Regional Laboratory (Erie, Pennsylvania) recently received a polydrug submission including plant material (identified as marijuana), white powder (identified as cocaine), and 14 pink tablets embossed with a number three on one side, suspected Ecstasy (see Photo 9). The exhibits were seized in Milcreek Township by the Milcreek Township Police Department. The tablets (total net mass 3.7 grams) were 8 millimeters in diameter and unmarked on the reverse face; analysis by color testing (Marquis), FT-IR, and GC/MS indicated not MDMA but rather a mixture of methamphetamine and lidocaine (quantitation not performed). This was the first submission of these type tablets to the laboratory.



Photo 9

- INTELLIGENCE BRIEF -

HASHISH OIL LABORATORY IN LAYTONVILLE, CALIFORNIA

[From the NDIC *Narcotics Digest Weekly* 2003;2(51):2
Unclassified, Reprinted with Permission.]

Investigators with the Mendocino County Major Crimes Task Force reported that on November 18, 2003, deputies with the Mendocino County Sheriff's Department discovered that three individuals were producing hashish oil in a Laytonville motel. Deputies responded to the motel after receiving a report of an explosion and fire. Upon their arrival, they found three individuals who had received severe burns when a clandestine laboratory they were operating in one of the rooms exploded. After securing the scene, the deputies called the task force to assist in dismantling the laboratory. In the room task force investigators discovered 93 full and 44 empty butane gas canisters and PVC pipes that were capped on one end. Each end cap had a hole drilled in it, and the pipes were filled with wet marijuana. Investigators also found 40 pounds of low quality "shake" (marijuana leaves, particularly plant trimmings, and powdery remnants of marijuana at the bottom of a bag) and a recipe for producing hashish oil obtained from the Internet. Although the individuals took precautions to avoid igniting the butane gas by putting duct tape over the outlets, inspectors believe that the explosion occurred when one of the individuals attempted to boil water by lighting a propane canister under a heating element. Investigators also found a bloody trail leading to another room in the motel. After obtaining a search warrant for the second room, investigators found additional laboratory materials as well as evidence that at least one other co-conspirator had fled the scene after the explosion. The three individuals burned in the incident were hospitalized in serious condition. Criminal charges against the individuals are pending.

NDIC Comment: Hashish oil is not widely abused in the United States, and discoveries of hashish oil laboratories are limited. Although constructing a laboratory to produce hashish oil is relatively simple, they are particularly dangerous to operate because the production process usually requires the heating of extremely flammable solvents.

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- INTELLIGENCE BRIEF -

WAMEGO (KANSAS) LSD LABORATORY - FINALE

[From the NDIC *Narcotics Digest Weekly* 2003;2(52):3
Unclassified, Reprinted with Permission.]

On November 25, 2003, the U.S. Attorney's Office for the District of Kansas announced that two men had been sentenced to prison after being convicted for conspiring to operate the largest complete LSD (lysergic acid diethylamide) laboratory ever seized by the DEA. One man was sentenced to life and the other was sentenced to 30 years, both without the possibility of parole. In March 2003, a federal jury found the two California residents guilty of conspiracy to

manufacture and distribute LSD and possession with the intent to distribute LSD. During the 11-week trial, prosecutors entered evidence showing that in October 2000 law enforcement authorities received information regarding an LSD laboratory located in a decommissioned missile silo in Wamego, Kansas. DEA agents obtained and executed a search warrant for the silo and discovered a nonoperational LSD laboratory. The agents also discovered 41.3 kilograms of LSD, 23.6 kilograms of iso-LSD (a by-product of LSD production), 97.5 kilograms of lysergic acid (a chemical used in LSD production), and 19 kilograms of ergocristine (an LSD precursor). Authorities guarded the evidence found at the silo and maintained surveillance on the site until early November 2000 when the defendants returned to move the laboratory to another location. The Kansas Highway Patrol stopped the men as they left the site; one defendant drove a rental truck containing the laboratory components, and the other drove an automobile. The defendant in the rental truck was arrested, and the other defendant fled on foot. He was apprehended and arrested the following day at a farm in Wamego. During a subsequent investigation, agents learned that although chemicals needed to produce LSD had been found in the missile silo, the seized LSD had actually been produced at another site.

NDIC Comment: The defendants in this case were responsible for the production of a significant amount of LSD that was widely distributed over several years. Investigators believe that the defendants previously were involved with two other complete LSD laboratories that DEA seized in 1996 (Oregon) and 1998 (California). Investigators also believe that between 1997 and 2000 the defendants used the equipment seized in October 2000 to operate LSD laboratories in Aspen (CO), Santa Fe (NM), and Carneiro (KS) before moving it to the missile silo in Wamego during July 2000. While authorities believe that no LSD was produced at the Wamego location, they estimate that the defendants used the laboratory equipment to produce approximately 10 million dosage units (2.2 pounds) of LSD every 5 weeks while at the Santa Fe location and comparable amounts while at the Carneiro location. The men sold the LSD to distributors in San Francisco and California. Additionally, investigators believe that some of the LSD was shipped overseas to the Netherlands via couriers on commercial airlines.

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Selected Intelligence Brief

Identification of Iodine and Red Phosphorus

Scott R. Oulton

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[Unclassified; Reprinted With Permission]

Iodine and red phosphorus are listed chemicals that may be received by forensic laboratories in connection with clandestine laboratory investigations. As such, these chemicals should be identified and reported as needed. There have been various inquiries to the DEA Office of Forensic Sciences with respect to how each laboratory is analyzing iodine and red phosphorus samples. Although not comprehensive, a summary of methods used by the laboratories to identify iodine and red phosphorus is presented below.

Iodine

Presumptive Screening Tests (1)

- * Visual: Iodine is a metallic solid.
- * Potassium-iodide test strip: Moistened and waved over iodine turns purple.
- * Iodine in chloroform yields a purple color. This can be decolorized with a thiosulfate solution.
- * Iodine mixed with red phosphorus and water will yield hydriodic acid; this solution reacted with silver nitrate yields a yellow precipitate. The pH will also be acidic.
- * Iodine added to a starch solution turns blue.

Qualitative Analysis

- * Iodine reacted with ethanol or acetone and sodium hydroxide forms iodoform. A GC/MS, GC/IR or FTIR of iodoform can be obtained. (1)
- * Iodine can be reacted with red phosphorus and water to form hydriodic and phosphoric acids. FTIR's of ephedrine hydriodide and ephedrine phosphate can be obtained by reacting the acid product with ephedrine base. (2)
- * A GC/MS of iodine can be obtained, produces fragments at m/z 127 and 254. (1)
- * Iodine can be reacted with benzene, sulfuric and nitric acids to form iodobenzene. This can be analyzed by GC/MS. (3)
- * Iodine can be reacted with ethanol and red phosphorus to form ethyl iodide. This can be analyzed by GC/MS. (3)
- * Iodine in various solvents (water, methanol, chloroform) exhibits a different absorbency max in visible ranges utilizing UV spectrophotometry.
- * Iodine can be reacted with red phosphorus and water to form hydriodic and phosphoric acids. FTIR's of ammonium hydriodide and ammonium hydrogen phosphate can be obtained by reacting the acid product with ammonia. (4)

Red Phosphorus

Presumptive Screening Tests (1)

- * Visual: Red phosphorus is a red powder.
- * Red phosphorus ignites with a flame and burns with a white smoke.
- * Use of commercial inorganic phosphorus test kit (Sigma, Molybdic acid based).
- * Red phosphorus mixed with iodine and water will yield hydriodic acid, this solution reacted with silver nitrate yields a yellow precipitate. The pH will also be acidic.
- * Red phosphorus can be oxidized by heating with 1:1 nitric and hydrochloric acids or by burning. The oxidized product can be tested in the following manner: 1) Oxidized sample in water then treated with barium chloride yields a white precipitate; and 2) Oxidized sample mixed with ammonium molybdate yields unique crystals observed under the microscope. (5)

Qualitative Analysis

- * Red phosphorus can be reacted with sodium hydroxide in a vial to form phosphine, then GC/IR headspace can be obtained.
- * Red phosphorus can be reacted with iodine and water to form hydriodic and phosphoric acids. FTIR's of ephedrine hydriodide and ephedrine phosphate can be obtained by reacting the acid product with ephedrine base. (2)
- * Red phosphorus can be reacted with iodine and water to form hydriodic and phosphoric acids. FTIR's of ammonium hydriodide and ammonium hydrogen phosphate can be obtained by reacting the acid product with ammonia. (4)
- * Red phosphorus can be converted to white phosphorus with heat, then GC/MS can be obtained. (6)

References:

1. McKibben T. Analysis of inorganic components found in clandestine drug laboratory evidence. *Journal of the Clandestine Laboratory Investigating Chemists Association* 1995;5(4):19.
2. Skinner HF, Oulton SR. Identification and quantitation of hydriodic acid manufactured from iodine, red phosphorus and water. *Journal of the Clandestine Laboratory Investigating Chemists Association* 1995;5(4):12.
3. Worley D, Schieferecke J, Baer J. GC/MS identification of iodine - Part One & Part Two. *Microgram* 2001;34(5):110.
4. Oulton SR, Skinner HF. Identification of common inorganic acids encountered at clandestine laboratories. *Microgram* 1998;31(10):277.
5. Christian D. Ammonium molybdate crystal test for phosphorus. *Journal of the Clandestine Laboratory Investigating Chemists Association* 1997;7(4):28.
6. Schieferecke J. Red phosphorus analysis using a gas chromatograph/mass spectrometer. *Microgram* 2000;33(12):339.

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SELECTED REFERENCES

[Note: 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.]

1. Nassr S, Dubuc MC, Lavoie P, Brazier JL. **HPLC-DAD methods for studying the stability of solutions containing hydromorphone, ketorolac, haloperidol, midazolam, famotidine, metoclopramide, dimenhydrinate, and scopolamine.** Journal of Liquid Chromatography and Related Technologies 2003;26(17):2909. [Editor's Notes: The focus of the study was to determine the stability of hydromorphone with other drugs. Contact: S Nassr, Aegera Therapeut Inc, 810 Chemin Golf, Verdun, PQ H3E 1A8, Canada.]
2. Kepczynska E, Bojarski J, Pyka A. **Lipophilicity of barbiturates determined by TLC.** Journal of Liquid Chromatography and Related Technologies 2003;26(19):3277. [Editor's Notes: A series 13 5,5-disubstituted derivatives of barbituric acid were analyzed by RP-TLC. Contact: A. Pyka, L Warynski Silesian Med Acad, Fac Pharm, Dept Analyt Chem, 4 Jagiellonska St, PL-41200 Sosnowiec, Poland.]
3. ElZeany BA, Moustafa AA, Farid NF. **Determination of zolpidem hemitartrate by quantitative HPTLC and LC.** Journal of Pharmaceutical and Biomedical Analysis 2003;33(3):393. [Editor's Notes: Presents two analyses of zolpidem in the presence of its degradation product: By TLC-UV densitometry, and by HPLC with UV detection. Contact: NF Farid, Cairo Univ, Fac Pharm, Dept Analyt Chem, 23 Elahrar St, Cairo, Egypt.]
4. Bell SEJ, Barrett LJ, Burns DT, Dennis AC, Speers SJ. **Tracking the distribution of "ecstasy" tablets by Raman composition profiling: A large scale feasibility study.** Analyst 2003;128(11):1331. [Editor's Notes: Approximately 1500 tablets (all primarily MDMA) from different seizures in Northern Ireland were analyzed and found to have significant differences in their Raman spectra due to the presence of impurities and the degree of hydration of the MDMA. The results indicated that sample-sample comparisons could be accomplished using Raman spectroscopy. Contact: SEJ Bell, Queens Univ Belfast, Sch Chem, Belfast BT9 5AG, Antrim, North Ireland.]
5. Stubbs DD, Lee SH, Hunt WD. **Investigation of cocaine plumes using surface acoustic wave immunoassay sensors.** Analytical Chemistry 2003;75(22):6231. [Editor's Notes: Presents the results of a series of experiments demonstrating real-time vapor phase detection of cocaine in the gas phase with SAW-based instruments. Contact: DD Stubbs, Georgia Inst Technol, Sch Chem & Biochem, Atlanta, GA 30296.]
6. Descroix S, Varenne A, Geiser L, Cherkaoui S, Veuthey J-L, Gareil P. **Influence of electrolyte nature on the separation selectivity of amphetamines in nonaqueous capillary electrophoresis: Protonation degree versus ion pairing effects.** Electrophoresis 2003;24(10):1577. [Editor's Notes: Presents the title analysis as applied to ecstasy and (unspecified) derivatives. Contact: Laboratoire d'Electrochimie et Chimie Analytique, UMR CNRS 7575, Ecole Nationale Supérieure de Chimie de Paris, Paris, Fr.]

7. Palhol F, Lamoureux C, Naulet N. **N-15 Isotopic analyses: A powerful tool to establish links between seized 3,4-methylenedioxymethamphetamine (MDMA) tablets.** Analytical and Bioanalytical Chemistry 2003;376(4):486. [Editor's Notes: 43 samples were analyzed by GC-Combustion-IRMS; the authors indicate that the technique can help establish common origins between samples. Contact: Laboratoire des Douanes de Paris, 75141 Paris, Fr.]
8. Chappell JS, Meyn AW, Ngim KK. **The extraction and infrared identification of gamma-hydroxybutyric acid (GHB) from aqueous solutions.** Journal of Forensic Sciences 2004;49(1):52. [Editor's Notes: Presents a liquid-liquid extraction technique for isolating GHB free acid, with analysis by IR. Contact: DEA Western Laboratory, 390 Main St., Room 700, San Francisco, CA 94105.]
9. Zhang D, Shi X, Yuan Z, Ju H. **Component analysis of illicit heroin samples with GC/MS and its application in source determination.** Journal of Forensic Sciences 2004;49(1):81. [Editor's Notes: Presents a profiling analysis based on GC and GC/MS. 500 samples were subclassified into nine groups using the presented techniques. Contact: hxju@nju.edu.cn]
10. Javerfalk-Hoyes E. **Development of methods in CE, CE-MS, and MS/MS: Applications in pharmaceutical, biomedical, and forensic sciences.** Diss. Abstr. Int., C 2002;63(1):77. [Editor's Notes: No abstract provided. Contact: Uppsala Universitet, Uppsala, Swed.]
11. Palhol F. **Contribution of isotopic analyses to the fight against drug trafficking.** Actualite Chimique 2003;(8-9):27. [Editor's Notes: Appears to be an overview of the topic (not clear from abstract). This article is written in French. Contact: LAIEM, Universite des Sciences et des Techniques de Nantes, Nantes 44322, Fr.]
12. Binder R, Machata G, Stead H. **Analysis of Potassium Permanganate as a Narcotic Drug Precursor.** Archiv fur Kriminologie 2003;211:160. [Editor's Notes: 31 samples were analyzed for 9 metallic elements using emission spectroscopy and ICP-OES. The results did not allow classification of the samples according to origin. This article is written in German, with an English summary. Contact: gottfried.machata@univie.ac.at]
13. Salimov AA, Hajiyevev SF. **Contemporary state of narcotics expertise.** Azerbaijan Eczacilik Jurnalı 2002;2(1):23. [Editor's Notes: Appears to be a mini-review of the state of forensic analysis of drugs in Azerbaijan (not clear in abstract). This article is written in Azerbaijani. Contact: Scientific Res. Institutes of Justice Expertise, Criminalistics and Criminology of Ministry of Justice of Azerbaijan Republic, Azerbaijan.]

Additional References of Possible Interest:

1. Suntornsuk L, Pipitharome O, Wilairat P. **Simultaneous determination of paracetamol and chlorpheniramine maleate by micellar electrokinetic chromatography.** Journal of Pharmaceutical and Biomedical Analysis 2003;33(3):441. [Editor's Notes: Presents an MEKC method for analysis of cold tablets. Contact: L Suntornsuk, Mahidol Univ, Fac Pharm, Dept Pharmaceut Chem, 447 Sri Ayudhaya Rd, Bangkok 10400, Thailand.]
2. Mabrouck MM, ElFatatry HM, Hammad S, Wahbi AAM. **Simultaneous determination of loratidine and pseudoephedrine sulfate in pharmaceutical formulation by RPLC and derivative spectrophotometry.** Journal of Pharmaceutical and Biomedical Analysis

- 2003;33(4):597. [Editor's Notes: Presents an HPLC method (using first derivative spectrophotometric detection) for analysis of the title compounds in pharmaceuticals. Contact: MM Mabrouck, Tanta Univ, Fac Pharm, Dept Pharmaceut Analyt Chem, Tanta, Egypt.]
3. Pitts SJ, Thomson CI. **Analysis and classification of common vegetable oils.** Journal of Forensic Sciences 2003;48(6):1293. [Editor's Notes: Presents methods of analysis for canola, corn, olive, peanut, safflower, soybean, and sunflower oils. (Although not stated, this study may also have value in the analysis of preparations of steroids in oils.) Contact: R.C.M.P. Forensic Laboratory, Edmonton, AB T5V 1B7, Can.]
 4. Altria KD, Elder D. **Overview of the status and applications of capillary electrophoresis to the analysis of small molecules.** Journal of Chromatography, A 2003;1023(1):1. [Editor's Notes: A review of the literature, 1999 - 2002, including forensic applications (not specified in abstract). Contact: New Frontiers Science Park, GSK R&D, Pharmaceutical Development, Product Line Extension Department, Third Avenue, Harlow, Essex CM19 5AW.]
 5. Balou S, Goodpaster JV, MacCrehan W, Reeder D, Eds. **Forensic analysis.** In: Anal. Bioanal Chem 2003;376(8). Springer-Verlag, Heidelberg, Germany, 2003. [Editor's Notes: No abstract or contact information was provided.]
 6. Nakazawa N. **Analysis of methamphetamine and amphetamine in wiped samples from the surface of the palms of methamphetamine abusers.** Kagaku Keisatsu Kenkyusho Hokoku, Hokagaku-hen 2003;55(1):23. [Editor's Notes: Analysis was done by GC/MS. This article was written in Japanese. Contact: Sci. Crime Detection Lab., Yamanashi Prefect. Police Headquarters, Yamanashi, Japan 406-0036.]
 7. Smyth WF. **Electrospray ionisation mass spectrometric behaviour of selected drugs and their metabolites.** Anal. Chem. Acta 2003;492:1. [Editor's Notes: Presents a review of the use of HPLC-ESI-MS for the analysis of selected (not specified) drugs and their metabolites. Contact: School of Biomedical Sciences, University of Ulster, Coleraine, Co. Derry, BT52 1SA, UK.]
 8. Matsuda K, Nakatoh S, Minatogawa Y, Suzuki K, Kimura H, Yamamoto S, Kohama A, Tohyama K. **Development of a GC/MS library for analyzing pesticides and drugs.** Rinsho Byori 2003;51(10):63871009-B963. [Editor's Notes: Presents the development of a library with 20 pesticides and herbicides, and 57 drugs. This article is written in Japanese. Contact: Dep. Clin. Lab., Kawasaki Med. Sch. Hosp., Kurashiki, Japan 701-0192.]

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NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations (next page) have returned rejection notices to the Microgram Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of February 2004. Note that the errors include anti-spamming comments, mailbox full messages, and user not found or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the microgram_editor@mailsnare.net address.

Israeli Police - Office of the Chief Superintendent - Israel

Laurent Rivier Scientific Consulting - Switzerland

Missouri - MSSC Regional Crime Laboratory - Joplin

Naval Criminal Investigative Service (NCIS) - San Diego Regional Laboratory

U.S. Food and Drug Administration - Northeast Regional Laboratory (Jamaica, New York)

The following organizations (listed last month) were dropped on 1/31/04:

Alabama Department of Forensic Sciences - Birmingham Laboratory

Bureau of Alcohol, Tobacco, and Firearms Laboratory - San Francisco

Massachusetts Department of Public Safety - Jamaica Plains

Ocean City (Maryland) Police Department Laboratory

Pennsylvania Office of the Attorney General

U.S. Food and Drug Administration - Arkansas Regional Laboratory

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**THE DEA FY - 2004 STATE AND LOCAL
FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

April 19 - 23, 2004

June 14 - 18, 2004

September 20 - 24, 2004

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 appended onto the October 2003 issue of *Microgram Bulletin*, and 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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EMPLOYMENT OPPORTUNITIES

1. Virginia Department of Criminal Justice Services

(Third and Final Posting)

Position: Forensic Scientist II (Controlled Substance Examiners) (Two Positions)

Location: Division of Forensic Science, Eastern Laboratory, Norfolk, VA

Salary: \$39,901 - \$65,540

Application Deadline: Open Until Filled

The Department of Criminal Justice Services is seeking two qualified individuals to perform forensic chemical analyses of suspected controlled substances in the Division of Forensic Science, Eastern Laboratory.

Duties: Incumbents will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

General Requirements: Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data, develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

Application Procedure: Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to gcolburn@dcjs.state.va.us or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at www.dcjs.org. For assistance, call Gene Colburn at (804) 786-6925.

Notes: Selected candidates must provide a DNA sample via a buccal swab (saliva sample), be fingerprinted and pass a security background check. Equal Opportunity Employer.

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2. Broward County Sheriff's Office (BSO)

(First Posting)

Position: Crime Laboratory Manager

Location: Ft. Lauderdale, Florida

Salary Range: To Be Determined.

Application Deadline: Open Until Filled

Duties: This position directs, administers and manages all forensic services functions for the BSO (a 6,100 member department located in Ft. Lauderdale). Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

Qualifications: A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

Application Procedures: You may view a detailed job description, download an application or apply on-line at: www.sheriff.org. A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

An article in your local newspaper on January 1st undoubtedly contained an annual New Year's article or column entitled: "What's In and What's Out". The reading of this column in my local paper caused me to reflect on what's "in" and "out" in the domain of digital evidence forensics. I think it is important to reflect periodically on how things are changing, in order to assess the trends in digital evidence technologies and evidence examination methodologies. The rapid changes in digital evidence forensics can be far reaching, and can affect laboratory equipment and software procurement strategies, design of standard operating procedures, and development of examiner training requirements.

My list for this year was surprisingly large. Much has changed, or is in the process of significantly changing.

End of DOS

DOS based computer evidence examination tools are "out". GUI based tools using the Microsoft Windows 2000 or XP platforms are "in". DOS based forensics tools are just too slow to process modern high capacity hard drives. However, you still need to keep your DOS operating system software and DOS forensic tools handy, in case you ever have to access

your archived files.

Write Blockers

Software-based write blocking technology is "out" and hardware-based write blocking technology is "in", at least in the case of Microsoft-based operating systems. Unix operating systems are still best protected from deleterious change by using the native "read only" commands embedded in all Unix systems.

Evidence Copying

Evidence copying using sector-by-sector copying (physical data acquisition) techniques of entire hard drives is "out", and copying techniques involving selected files, data folders, or hard drive partitions (logical data acquisition) is "in". The volume of information now maintained on many business computers or computer networks has become enormous. Physical data acquisition is simply not practical when large servers, computer networks, or data farms/warehouses are encountered.

Evidence Storage Format

Evidence data acquisition involving the duplication of hard drive data is "out". Copying data into "image" files (consisting of files with all of the hard drive data and formatting structure), that are easily mounted as virtual drives (no

hardware interface issues), are "in". Use of image file formats saves examiner processing time by eliminating hardware complexity problems and simplifying hard drive format access methods.

External Media

External storage media technology continues to rapidly change, and maintaining the appropriate hardware "reader devices" is a constant challenge. Previously mainstream technologies such as floppy diskettes or Iomega Jaz and Zip cartridges are becoming obsolete ("out"), while replacement technologies such as CD's, thumb drives, memory sticks, and DVD's are "in". Surprisingly, however, tape technology continues to play an important role in data backup. In addition, acquiring and maintaining a robust collection of PDA docking (recharging) cradles is becoming essential to laboratory operations.

Potential Probative Information Recovery

The nature of digital communications is changing from file transfers containing documents or e-mails, to web-based communications containing web-based e-mail or e-commerce transactions. The impact of these changes on digital forensics is significant. Extensive data recovery

involving traditional techniques, such as active file browsing or erased file recovery, is diminishing (on the way “out”), and processing (carving) of hard drives for non-file keystroke data that is stored on the hard drive as unallocated clusters (i.e., in “free space”) or in the “swap file”, is increasing (“in”).

Evidence Integrity

The technology used to validate copies of the original evidence has significantly evolved. The use of data packet communication algorithms, commonly known as a Cyclic Redundancy Check (CRC), is “out”, and global hard drive or file data integrity checks, known as hash algorithms, are “in”. Hash techniques such as MD-5 have a higher statistical probability calculation of certainty than a CRC check. The purpose of the CRC or hash check is to assess (within a certain degree of statistical probability) that a digital file copy containing binary data is the same as the original file from which it was copied. Such calculations are usually expressed as one in 28, 216, 224, or 264 possibilities that two different binary data sets (such as a file, partition, or hard drive) could have the same hash value. Larger hash value calculations increase the certainty of estimating the uniqueness of data sets.

Forensic Software Architecture

Standalone forensic tools are “out”, and multi-functional software examination software suites are “in”. The integration of multiple digital forensic

examination tasks such as imaging, browsing, keyword searching, and carving, in one unified software program, has simplified laboratory operations by making it easier to conduct examiner training, coordinate software upgrades and validate the examination software. The integrated tools enhance examiner proficiency by enabling the user to utilize one common set of software commands to process a wide variety of hard drive formats (FAT-32, NTFS, HPS, etc.).

Legal

On-site copying of evidence at businesses and professional offices is “in”, and physical removal of the computers to a digital evidence laboratory is “out”. Courts are becoming more reluctant to authorize removal of computers, especially in cases involving businesses where both licit and illicit records may be commingled. Having robust on-site backup equipment and software is essential to the effective operation of a digital evidence laboratory.

Questions or comments?
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