

Microgram

Bulletin

Published by:

The Drug Enforcement Administration
Office of Forensic Sciences
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- OCTOBER 2006 -

- INTELLIGENCE ALERT -

ECSTASY MIMIC TABLETS CONTAINING 1-(3-CHLOROPHENYL)- PIPERAZINE (mCPP) IN VERNON HILLS, ILLINOIS

The Northeastern Illinois Regional Crime Laboratory (Vernon Hills) recently received 140 mottled tablets with a “shark” logo on one face and half-scored on the opposite face, suspected MDMA (see Photo 1). The exhibits were seized in Vernon Hills by the Lake County Metropolitan Enforcement Group (details sensitive). Analysis of the tablets (total net mass about 42 grams) by Marquis and Mecke color testing and GC/MS, however, indicated only trace MDMA (not confirmed) and 1-(3-chloro-phenyl)piperazine (mCPP; not quantitated but a high loading based on the TIC). mCPP



Photo 1

is a metabolite of trazodone (an antidepressant), and is not controlled in Illinois; however, it is being increasingly encountered as a MDMA-mimicking compound. This was the first submission of mCPP, and also the first ever submission of “shark” logo tablets, to the laboratory.

- INTELLIGENCE ALERT -

**IMPRINTED METHAMPHETAMINE BRICKS AT THE
SAN YSIDRO, CALIFORNIA PORT OF ENTRY**

The DEA Southwest Laboratory (Vista, California) recently received two separate but similar sets of bricks of a highly compressed, off-white substance, all suspected methamphetamine. The first submission contained eight bricks, all imprinted with a stylized “X” logo (see Photo 2), whereas the second submission contained ten bricks, all imprinted with a rather crudely formed six-pointed “Star” (roughly similar to a Star of David; see Photo 3). The exhibits were all seized by Immigration and Customs Enforcement personnel from two different vehicles entering at the San Ysidro Port of Entry (San Diego); in both cases, the bricks were concealed in the vehicle’s spare tire. The bricks were similar in dimensions to standard cocaine kilogram bricks, and were also wrapped in multiple layers of plastic in the same manner typically seen with cocaine bricks; however, they were moist with solvent (odor of acetone and toluene), and weighed between 1.4 and 1.5 kilograms each when received (approximately 5 - 10 percent of this weight was lost on drying). Analysis of the eight-brick seizure (total net mass 10.81 kilograms dry weight) by FTIR-ATR, LC, and GC (both direct and after TPC derivatization) confirmed 99 percent d-methamphetamine hydrochloride. Analysis of the ten-brick seizure (total net mass 13.46 kilograms dry weight) by the same techniques confirmed 98 percent d-methamphetamine hydrochloride. Analysis of the solvent by Headspace-GC/MS confirmed a mixture of acetone and toluene. These were the first submissions of methamphetamine formed, imprinted, and packaged like cocaine to the Southwest Laboratory (previous submissions of rectangular packages of crystalline methamphetamine were contained in rigid containers (plastic, wood, or similar materials), not compressed and imprinted).



Photo 2



Photo 3

[Editor’s Notes: The DEA South Central Laboratory (Dallas, Texas) received two separate submissions of “methamphetamine bricks” in 2006; however, in both cases the bricks were not high purity, were not imprinted with logos, and were much thinner than typical cocaine bricks. To date, these appear to be the only similar such submissions to the DEA laboratory system.]

- INTELLIGENCE ALERT -

**METHAMPHETAMINE SOLUTIONS IN LARGE TEQUILA BOTTLES
AT THE LAREDO, TEXAS PORT OF ENTRY**

The DEA South Central Laboratory (Dallas, Texas) recently received three 3-liter tequila bottles each containing a golden brown liquid, suspected to be a solution of cocaine (see Photo 4). The exhibits were seized by Customs and Border Protection officers from a vehicle entering at the Laredo, Texas Point of Entry (no further details). Analysis of the liquid (total net volume 9,136 milliliters) by GC/MS, FTIR, and HPLC, however, indicated not cocaine but rather 41 percent methamphetamine hydrochloride (equivalent to 3.78 kilograms total net mass) and dimethyl sulfone (not quantitated). The liquid had the characteristic odor of tequila, but was not formally identified. This was the first such submission to the South Central Laboratory.



Photo 4

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- INTELLIGENCE BRIEF -

HEROIN IN METAL PIPE SECTIONS IN DORAL (MIAMI), FLORIDA

The DEA Southeast Laboratory (Miami, Florida) recently received 47 metal pipe sections each containing a plastic-wrapped package of light beige powder, suspected heroin (see Photo 5). The exhibits were seized by agents from the DEA Miami Field Division while executing a consent search at a warehouse in Doral (a suburb of Miami). The pipe sections were substitute

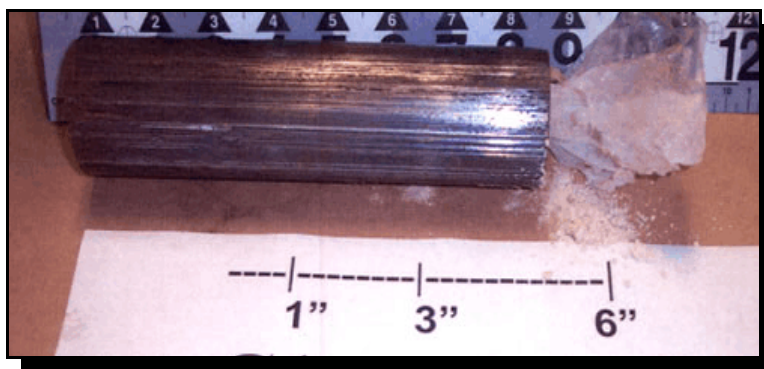


Photo 5

“pins” for the bushings of a very heavy duty tractor chain (see Photo 6, next page). Each “pin” was approximately 7.5 inches long by 2 inches in diameter, contained about 300 grams of powder, and had been sealed on both ends with a gray epoxy resin. Analysis of the powder (total net mass 14.21 kilograms) by GC/FID, GC/MS, and FTIR confirmed 90 percent heroin hydrochloride. This is the second known submission to the Southeast Laboratory of heroin concealed in pipes; the first case was in 1995 (details of the latter case are no longer available).



Photo 6

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- INTELLIGENCE ALERT -

HEROIN “HOCKEY PUCKS” IN NEW JERSEY

The DEA Northeast Laboratory (New York, New York) recently received four disks of highly compressed, tan powder wrapped in green or white colored plastic, each having imprinted logos on both their front and back faces, suspected heroin (see Photo 7). The exhibits were seized at a location in New Jersey by the DEA Newark Field Division (details sensitive). Because of their unusual form and dimensions (3.75 inches in diameter by 1.5 inches in width), these type of exhibits are sometimes referred to as “hockey pucks.” The logos on the front faces appeared to be negative impressions of poker chips (one “Star” logo and three “Cards” logo, respectively), while all four had a negative impression of what appears to be a “Leo” medallion on their back faces (see Photos 8 - 10, next page; note that the colors are not true). Analysis of the powder (total net mass 997.8 grams) by GC/FID, GC/MS, LC/MS, NMR, and FTIR-ATR confirmed 57 percent heroin hydrochloride, adulterated with thiamine, lidocaine, procaine, and creatine. This is the second submission of “hockey pucks” to the Northeast Laboratory in the past six months; the first such submission was made by the New England Field Division (no further details).



Photo 7



Photo 8



Photo 9



Photo 10

SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Abbasi K, Bhangar MI, Khuhawar MY. **Capillary gas chromatographic determination of phenylpropanolamine in pharmaceutical preparation.** *Journal of Pharmaceutical and Biomedical Analysis* 2006;41(3):998. [Editor's Notes: Trifluoroacetylacetone was used as a derivatizing reagent. The method was used for analysis of two different tablets. Contact: Univ Sindh, Dr MA Kazi Inst Chem, Jamshoro, Pakistan.]
2. Capella-Peiro ME, Bose D, Rubert MF, Esteve-Romero J. **Optimization of a capillary zone electrophoresis method by using a central composite factorial design for the determination of codeine and paracetamol in pharmaceuticals.** *Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences* 2006;839(1-2):95. [Editor's Notes: Presents the title study; analyses could be done in less than 3 minutes. Contact: Univ Jaume I, Area Quim Analit, Castellon de La Plana 12080, Spain.]
3. Dinc E, Ozdemir A, Aksoy H, Ustundag O, Baleanu D. **Chemometric determination of naproxen sodium and pseudoephedrine hydrochloride in tablets by HPLC.** *Chemical & Pharmaceutical Bulletin* 2006;54(4):415. [Editor's Notes: PDA detection was used, and the results were compared versus a standard HPLC method. Contact: Ankara Univ, Fac Pharm, Dept Analyt Chem, TR-06100 Ankara, Turkey.]
4. Dresen S, Kempf J, Weinmann W. **Electrospray-ionization MS/MS library of drugs as database for method development and drug identification.** *Forensic Science International* 2006;161:86. [Editor's Notes: Includes 800 compounds, including many controlled substances. The data files have been posted on-line as .pdf documents. Contact: Institute of Forensic Medicine, Forensic Toxicology, University Hospital, Albertstrasse 9, D-79104 Freiburg, Germany.]
5. ElGindy A, Emara S, Mostafa A. **Application and validation of chemometrics-assisted spectrophotometry and liquid chromatography for the simultaneous determination of six-**

- component pharmaceuticals.** Journal of Pharmaceutical and Biomedical Analysis 2006;41(2):421. [Editor's Notes: Pharmaceuticals included theophylline, guaifenesin, diphenhydramine, methylparaben, propylparaben, and sodium benzoate in a syrup. Detection/quantitation at 222 nm. Contact: Suez Canal Univ, Fac Pharm, Pharmaceut Analyt Chem Dept, Ismailia 41522, Egypt.]
6. Ilias Y, Bieri S, Christen P, Veuthey JL. **Evaluation of solid-phase microextraction desorption parameters for fast GC analysis of cocaine in coca leaves.** Journal of Chromatographic Science 2006;44(7):394. [Editor's Notes: Abstract unavailable. Contact: Univ Geneva, Univ Lausanne, Sch Pharmaceut Sci EPGL, Lab Pharmaceut Analyt Chem, 20 Bd Yvoy, CH-1211, Geneva 4, Switzerland.]
 7. Iwata YT, Inoue H, Kuwayama K, Kanamori T, Tsujikawa K, Miyaguchi H, Kishi T. **Forensic application of chiral separation of amphetamine-type stimulants to impurity analysis of seized methamphetamine by capillary electrophoresis.** Forensic Science International 2006;161:92. [Editor's Notes: A highly sulfated gamma-cyclodextrin was used as the chiral selector. Contact: National Research Institute of Police Science, 6-3-1 Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]
 8. Kochana J, Parczewski A, Wilamowski J. **SPE/TLC profiling of the impurities of MDMA: The influence of agglutinants, diluents, and adulterants.** Journal of Liquid Chromatography & Related Technologies 2006;29(9):1247. [Editor's Notes: Presents the title study. Contact: Jagiellonian Univ, Dept Analyt Chem, Fac Chem, Ingardena 3, PL-30060 Krakow, Poland.]
 9. Lee JS, Han EY, Lee SY, Kim EM, Park YH, Lim MA, Cgung HS, Park JH. **Analysis of the impurities in the methamphetamine synthesized by three different methods from ephedrine and pseudoephedrine.** Forensic Science International 2006;161:209. [Editor's Notes: Impurity profiling was conducted on 16 different samples using GC/FID and GC/MS. The results were able to differentiate samples produced via the chloroephedrine, HI/red P, and I₂/red P/H₂O routes. Contact: Research Institute of Pharmaceutical Sciences, College of Pharmacy, Seoul National University, Seoul 151-742, Republic of Korea.]
 10. Meng P, Fang N, Wang M, Liu H, Chen DDY. **Analysis of amphetamine, methamphetamine, and methylenedioxymethamphetamine by micellar capillary electrophoresis using cation-selective exhaustive injection.** Electrophoresis 2006;27:3210. [Editor's Notes: CSEI is used as an on-line concentration method; in this case, sensitivity was increased 1000-fold versus standard capillary MEKC. Contact: Department of Chemistry, University of British Columbia, 2036 Nain Mall, Vancouver V6T 1Z1, Canada.]
 10. Mohamed R, Gremaud E, Richoz-Payot J, Tabet JC, Guy PA. **Quantitative determination of five ergot alkaloids in rye flour by liquid chromatography - electrospray ionisation tandem mass spectrometry.** Journal of Chromatography A 2006;1114(1):62. [Editor's Notes: The target alkaloids were ergocristine, ergotamine, ergonovine, ergocornine, and ergokryptine; 15 samples of rye flour were analyzed. Contact: Nestec Ltd, Nestle Res Ctr, Dept Qual & Safety Assurance, Vers Chez Les Blanc, POB 44, CH-1000 Lausanne 26, Switzerland.]
 11. Schmidt AH. **Validated HPLC method for the determination of residues of acetaminophen, caffeine, and codeine phosphate on swabs collected from pharmaceutical manufacturing equipment in support of cleaning validation.** Journal of Liquid Chromatography & Related Technologies 2006;29(11):1663. [Editor's Notes: Presents the title study. Contact: Steiner & Co, Deutsch Arzneimittel Gessell, Ostpreussendam 72-74, D-12207 Berlin, Germany.]

12. Stefan-van-Staden RI, Lai B. **Enantioselective, potentiometric carbon paste electrodes based on C-60 derivatives as chiral selectors for the enantioanalysis of S-clenbuterol.** *Analytical Letters* 2006;39(7):1311. [Editor's Notes: Presents the title study, using three different electrodes, for analysis of both raw material and serum samples. Contact: Univ Pretoria, Dept Chem, ZA-0002 Pretoria, South Africa.]
13. Teng S-F, Wu S-C, Liu C, Li J-H, Chien C-S. **Characteristics and trends of 3,4-methylenedioxyamphetamine (MDMA) tablets found in Taiwan from 2002 to February 2005.** *Forensic Science International* 2006;161:202. [Editor's Notes: 181 tablets were analyzed by GC/MS. Photographs of the tablet logos are shown. Contact: National Bureau of Controlled Drugs, Department of Health, 6 Linsen South Road, Taipei 100, Taiwan.]
14. Wang M, Marriott PJ, Chan WH, Lee AWM, Huie CW. **Enantiomeric separation and quantification of ephedrine-type alkaloids in herbal materials by comprehensive two-dimensional gas chromatography.** *Journal of Chromatography A* 2006;1112(1-2):361. [Editor's Notes: The alkaloids were norephedrine, ephedrine, pseudoephedrine, and methyl-ephedrine. The results differentiated between herbal products from natural vs. synthetic sources. Contact: Hong Kong Baptist Univ, Dept Chem, Kowloon, Hong Kong, Peoples R China.]
15. Wolowich WR, Perkins AM, Cienki JJ. **Analysis of the psychoactive terpenoid Salvinorin A content in five *Salvia divinorum* herbal products.** *Pharmacotherapy* 2006;26(9):1268. [Editor's Notes: Analyses were conducted using HPLC and TLC/GC/MS. The samples were purchased from Internet and "Head Shops." The samples were all subpotent with respect to stated Salvinorin A content, and three also contained unreported adulterants. Contact: Nova Southeastern University, 3200 University Drive, Fort Lauderdale, FL 33328.]

Additional References of Possible Interest:

1. Beckerleg S, Telfer M, Sadiq A. **A rapid assessment of heroin use in Mombasa, Kenya.** *Substance Use & Misuse* 2006;41:1029. [Editor's Notes: Presents the title survey, done in March, 2004. 496 Heroin users were interviewed. Contact: London School of Hygiene & Tropical Medicine, London, UK.]
2. Jones AW. **Which articles and which topics in the forensic sciences are most highly cited?** *Science & Justice* 2005;45(4):175. [Editor's Notes: Covers the *Journal of Forensic Sciences* from 1956 to 2005. Contact: Department of Forensic Toxicology, University Hospital, Linköping 581 85, Swed.]
3. Neuvonen K, Neuvonen H, Fulop F. **Effect of 4-substitution on psychotomimetic activity of 2,5-dimethoxy amphetamines as studied by means of different substituent parameter scales.** *Bioorganic & Medicinal Chemistry Letters* 2006;16(13):3495. [Editor's Notes: Presents the title study, using various Hammett substituent scales. Contact: Univ Turku, Dept Chem, FIN-20014 Turku, Finland.]
4. Sproll C, Perz RC, Lachenmeier DW. **Optimized LC/MS/MS analysis of morphine and codeine in poppy seed and evaluation of their fate during food processing as a basis for risk analysis.** *Journal of Agricultural and Food Chemistry* 2006;54:5292. [Editor's Notes: Presents the title study. Cooking reduces the concentration of both alkaloids, especially in ground poppy seed. Contact: Chemisches und Veterinaruntersuchungsamt (CVUA) Karlsruhe, Weissenburger Str. 3, D-76187 Karlsruhe, Germany.]

5. Yoon WL. **Near-infrared spectroscopy: A novel tool to detect pharmaceutical counterfeits.** American Pharmaceutical Review 2005;8(5):115. [Editor's Notes: Presents the title study. Contact: New Product Development, GlaxoSmithKline, UK.]

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THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Provide full mailing address in request. **Important!:** Do not provide an address that irradiates mail!

* Federal Criminal Code and Rules, 2006 Edition.

* Physician's Desk Reference, 56th Edition (2002).

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The next offering of journals and textbooks will be in the January 2007 issue of *Microgram Bulletin*.

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THE DEA FY - 2007 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2007 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

November 13 - 17, 2006
February 5 - 9, 2007
May 7 - 11, 2007
July 9 - 13, 2007
September 10 - 14, 2007

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: J. Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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The Challenge

Hiring and retaining Computer Forensic professionals is not an easy task. With the ever-expanding use and increasing diversity and sophistication of computers and other digital communication devices, it has become more and more difficult to hire and retain a work force that is capable of handling all of the technological challenges that may arise during the course of an investigation.

Who you recruit for your program depends in part on your organization. Government agencies usually concentrate on criminal and intelligence-gathering cases, while private (business) agencies usually focus on fraud and employee misconduct cases.

However, program emphasis is only the first issue. In law enforcement agencies, should you hire someone with Information Technology (IT) and/or Computer Science (CS) education and experience - or should you instead hire someone who has had many years of law enforcement experience? Individuals with IT/CS training should be able to handle just about any software or technical issue that comes up while processing digital evidence; however, they will have very limited investigative skills. Whereas individuals with law enforcement experience can approach digital evidence cases from an investigator's point of view, but they will (probably) have only limited knowledge of computer systems and digital technologies.

What is the Right Mix?

The proper answer would appear to be identifying individuals that are fully versed in IT/CS and also have law enforcement and/or investigative background. However, finding such individuals is very difficult - and in today's hiring environment, maybe impossible. This suggests that it would be better to hire IT/CS personnel and train them in investigative techniques, or hire law enforcement professionals and train them in IT and CS. That is, start at either end and train towards the central "ideal" employee, accepting that developing such dual-expertise is a long-term objective. While this approach can succeed, it takes years to develop a complete staff in this manner, and each employee departure or retirement is a major setback.

Experience has shown that in lieu of "ideal" (dual-expertise) employees, a mix of IT/CS and law enforcement professionals is a reasonable compromise. A ratio of 3:1 IT/CS experts to investigators is considered to be about the right combination for a government computer forensic program.

In order to maximize the benefits of such a mixed employee force, you should first create a work environment that promotes information sharing. You can best achieve this by placing everyone in a single, large room with no visual or physical obstructions. This type of setup promotes communication and cooperation.

Second, you should hire individuals that are true experts in their fields, whether in IT/CS or in law enforcement/investigation. Avoid hiring personnel who are "Jacks of all Trades but Masters of None." Third and finally, all employees should be continuously cross-trained in their counterparts' strengths. A well-balanced work force can complement and assist each other, and together should be able to take care of any challenge presented to them.

Competing for Qualified Employees

With the highly competitive market for IT/CS professionals, significantly lower pay scales and hiring freezes by government agencies, and the often long waits applicants have to endure for their security clearances, it is no surprise that law enforcement agencies keep losing quality applicants to the private sector. Government agencies are at a significant disadvantage when competing with computer forensic programs within the private sector, especially those in auditing and finance. However, it is not a one-way street. In many cases, potential employees find a government position to be more attractive on the basis of non-financial aspects, e.g., the better benefits, higher job stability, and enhanced advancement opportunities versus those found in the private sector. The diversity of computer forensic case work is also intriguing to potential employees who are trying to start a career in law enforcement, or who already have a law enforcement background and would like to continue it in a different field.

One of the methods used by DEA and other government agencies to find permanent staff for their computer forensic programs is to use contract personnel as temporary employees, with an eye towards offering government positions to the more qualified contractors. Other methods include offering incentives like signing bonuses or higher grade levels, when such options are available to the agency; these can be very attractive to those professionals that are looking for a competitive salary and/or benefits versus those offered by the private sector.

Conclusions

Having an aggressive hiring program, that emphasizes the benefits of government service, is key to attracting qualified IT/CS professionals and seasoned investigators to law enforcement computer forensics programs. In summary, strive to develop good hiring criteria and always try to hire individuals with the qualifications that best fit your program.

Previous Computer Corner Columns in this Field

The following columns may be of interest for managers trying to staff their computer forensic programs:

#136 - July 2000 - Basic Examiner Qualifications *

#148 - July 2001 - Different Computer Forensic Techniques in Drug Investigations *

#155 - February 2003 - The Impact of Specializations

#174 - September 2003 - Examiner Candidate Interview Strategies

#179 - February 2004 - Digital Evidence Trends

#200 - November 2005 - New Examiner Interview Topics

[* - Law Enforcement Restricted Issue of *Microgram*]

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