The IAI’s annual International Educational Conference will be held July 22-28, 2012 in Phoenix, Arizona.

ALL EDUCATIONAL SESSIONS WILL BE HELD AT THE Phoenix Convention Center
100 North 3rd Street, Phoenix, AZ 85004

The President’s Welcome Reception and some Committee Meetings are on Sunday, July 22, 2012. Lectures and workshops begin on Monday, July 23 and continue until 1:00 p.m. on Friday, July 27, followed by the Business Meeting and then the Installation & Closing Banquet. (suggested checkout Saturday, July 28)

Registration will be $295 (U.S.) for International Association for Identification members and $395 for nonmembers. There would be an estimated additional $250 for workshop fees (based on the sessions that you select). Individual workshops will range from $20 to $100 — dependent on the course content.

The complete Conference program, which will include all of the workshop information and the registration, will appear on the IAI website in the Spring of 2012.

If you are interested in joining the IAI – please contact the headquarters office at 1-954-589-0628.
## Features

<table>
<thead>
<tr>
<th>Article</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officers, Board of Directors, Committees</td>
<td>6</td>
</tr>
<tr>
<td>Iowa IAI Spring Conference Information</td>
<td>8</td>
</tr>
<tr>
<td>Article: Technical Note - Validation of Vinyl Static Cling Film for the Collection and Preservation of Dust Impressions</td>
<td>10</td>
</tr>
<tr>
<td>Article: Drug Trends: Synthetic Cannabinoids, Synthetic Cathinones, Salvia and Kratom</td>
<td>18</td>
</tr>
<tr>
<td>Article: One Good Shot</td>
<td>24</td>
</tr>
<tr>
<td>Upcoming Training</td>
<td>27</td>
</tr>
<tr>
<td>Article: Case Law Update</td>
<td>28</td>
</tr>
</tbody>
</table>
As a member of the Iowa Division of the IAI, and being actively engaged in the profession of Scientific Identification and Investigation, I dedicate myself to the efficient and scientific administration thereof in the interest of Justice and the betterment of Law Enforcement. To cooperate with others of the profession, promote improvement through research, and disseminate such advancement in my effort to make more effective the analysis of the expert. To employ my technical knowledge factually, with zeal and determination, to protect the ethical standards of the profession of Scientific Identification and Investigation. I humbly accept my responsibility to Public Trust and seek continued guidance that I may keep inviolate the Profession of Law Enforcement.
***Reminder***

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Validation of Vinyl Static Cling Film for the Collection and Preservation of Dust Impressions

Jan LeMay, Stephen Adams, Andrea Stephen

This article originally appeared in the July/August 2011 issue of the Journal of Forensic Identification (Vol. 61, No. 4, Pg 317-332). It provides research data for a reasonable alternative to some of the products we currently use for collecting and preserving dust impressions.

Abstract: The use of vinyl static cling film (VSCF) to collect dust impressions on a variety of surfaces is compared to the use of an electrostatic dust lifter (ESDL). The VSCF produces slightly better results and provides a more economical method of collecting dust prints.

Introduction

Vinyl static cling films (VSCF) are used as signs, decals, window graphics, door coverings, and protective masking. VSCF is manufactured in all sizes, colors, and degrees of opacity. “Static cling vinyl is a special formulation of polyvinyl chloride (PVC) to which a large amount of plasticizer (a liquid) has been added” [1]. Plasticizers are additives that soften the final product, increasing its flexibility [2]. It is the plasticizers that also give VSCF its ability to stick to smooth, glossy surfaces like glass and metal without an adhesive and without leaving any residue. It is the interaction of the different molecular structures of the PVC and the plasticizers that create what chemists refer to as van der Waals forces [3]. This is the intermolecular attraction of polar molecules that induce weak electrostatic forces [4], generating the “cling” between the VSCF and other surfaces. It is obvious that this attraction also applies to dust particles, because the VSCF will pick up and hold the dust impressions. A search of the literature revealed no research conducted in the use of VSCF for the use of collecting and preserving impression evidence in dust.

Dust impressions can be created when an object, such as a shoe or tire, tracks across a surface, transferring dust from the object to the surface. They can also be created when the object removes dust from a surface, creating a negative impression. Lifting the impression is a way of transferring the dust impression from its original surface to a surface that will provide better contrast. The lift provides improved visibility of the impression’s features through improved contrast and also provides a means to recover, transport, and preserve the impression.

Equipment and materials that are used to collect dust impressions can be expensive and are often unavailable to crime scene officers. Electrostatic dust lifters (ESDL) can range in price from $500 to $600 (USD), and the mylar film can cost about $1 (USD) per sheet. Rubber gelatin lifters in a size large enough to lift a footwear impression in dust can cost about $7 (USD) per sheet. Although these products are useful and effective for the collection of dust impressions, their cost and availability can make their use prohibitive.

Electrostatic dust lifters use a high voltage source to create a static charge on the lifting film that causes the dust or residue particles composing the footwear to transfer to the underside of the lifting film [5]. The output from electrostatic dust lifters is potentially lethal [6], and this method, when used on a conductive surface, can pose a safety and health risk to the user. Dust impressions on surfaces (e.g., vehicle hoods) can be challenging to collect. Electrostatic dust lifters can be used on conductive metal surfaces with the application of automotive window tinting film between the surface and the lifting film [7]. This adds to the expense. Window tint film (Axius Professional Limo Dark Tint, Axius Auto Shade, Moorpark, CA) currently costs about $8 (USD) for a 2’ x 6.5’ sheet.

Gelatin lifters can be used on conductive surfaces. However, if the surface is very hot (e.g., a vehicle hood on a warm day), the gelatin may melt, thus damaging the impression. Gelatin lifters can dry out or be damaged in extreme heat. Impressions collected with a gelatin lifter may also lose detail over time because of the residue being absorbed or obscured by the gelatin [5].
VSCF was tested to determine whether it would be a practical and cost-effective means of collecting and preserving dust impressions. A sheet of film 9” x 12” can be purchased for less than $1 USD, making it much more cost-effective than electrostatic dust lifters or gelatin lifters. VSCF is available in a variety of colors to provide a variety of background contrast with different colored matrices.

Materials and Methods

Three trained footwear examiners participated in the study. Each independently followed an established set of guidelines and procedures in conducting this study (Appendix). Their results were then compiled and averaged at the conclusion of the study.

For the purpose of this study, black 9” x12” VSCF sheets (Grafix Plastics, Cleveland, OH) and electrostatic dust lifter sheets (Forensic Source, Jacksonville, FL) were used. The ESDLs used in the study were the PathFinder Electrostatic Dust Mark Lifting Device (Bradenburg, West Midlands, U.K.).

Footwear impressions in dust from left and right shoes were placed on plastic, glass, paper, linoleum flooring, metal at room temperature, hot metal, cold metal, bare wood, and finished wood (Figures 1–6). The dust was applied to the shoes by walking across a concrete floor for several paces, then stepping onto the prepared surfaces. One impression of the pairs was lifted using ESDL and one was lifted using the VSCF. The lifts were stored in manila folders or boxes. Observations and comparisons were made immediately after the lifts were created, at a three-month interval, and at a six-month interval (Figures 7, 8). At each interval, the quality of the impressions was evaluated and rated using the same scale (Appendix). The lifts were visually compared to each other for this quality rating. This analysis was based on each examiner’s interpretation of the rating scale. At the conclusion of the six-month study, the analysts’ results were compiled and averaged. Photographs were taken at consistent lighting and exposure settings to document the conditions of the impressions.

Figure 1
A VSCF dust lift of a footwear impression on glass.

Figure 2
An ESDL dust lift of a footwear impression on glass.
Figure 3
A VSCF dust lift of a footwear impression on vinyl flooring.

Figure 4
An ESDL dust lift of a footwear impression on vinyl flooring.

Figure 5
A VSCF dust lift of a footwear impression on paper.
Results and Discussion

The observations made immediately after the lifts were created showed that the VSCF produced slightly superior contrast and detail than the ESDL (Table 1). The results of the VSCF were markedly superior to ESDL on the room temperature and hot metal surfaces. They were also markedly superior on the plastic surfaces. It seemed that the ESDL did not ground well on the plastic
surfaces and therefore did not generate a sufficient electrostatic charge to lift the dust impressions sufficiently.

There was very little change in the ratings when the lifts were observed and compared after three months of storage (Table 2). One examiner observed an improvement in the contrast and detail of the VSCF lift from the plastic surface. In the examiner’s initial observation, he rated this lift at zero, meaning he observed no difference in contrast and detail between the VSCF and the ESDL. At the three-month interval, he rated it at +2. The same examiner also noted an improvement in contrast and detail in the VSCF lift from the vinyl floor surface. In his initial observation, he rated this lift +1, and at the three-month interval, he rated it +2. The reason for this improvement is unclear, but an improvement in contrast and detail was observed when comparing the lifts from the plastic surface and the vinyl floor surface after the interval.

There was also very little change in the ratings when the lifts were observed and compared after six months of storage (Table 3). One examiner did note an improvement in his VSCF lift from the plastic surface. On his initial observation and after three months, he rated the VSCF lift from plastic at +1. Upon examining it at the six-month interval, he rated it +2.

No deleterious change was observed from the immediate observations after the lifts were created to six months later after being stored in manila folders or boxes. Overall, the VSCF registered finer detail than the ESDL. Edges of footwear outsole design elements and fine individual detail generally appeared more clearly defined in the VSCF lifts. The VSCF lifts were also less glossy and reflective than the ESDL lifts and therefore had less specular highlights when photographed. A slight increase in background dust could be observed on all of the lifts after three months and even more after six months of storage.

It should be noted that the material safety data sheet for the vinyl static cling film used in this study states that the vicat-softening point of the film is 70 °C (158 °F). The metal plate used in the study was heated in an oven at 170 °F for 20 minutes. No softening, stretching, or shrinking of the VSCF used on the hot metal surface was observed.

Conclusion

The use of VSCF is an effective, affordable, and simple method for the lifting of dust impression evidence at crime scenes and off of evidence. The results of the study show that on some surfaces it performs better than electrostatic dust lifters. It can be packaged and preserved well in simple manila folders, which can in turn be packaged and sealed in paper bags or larger manila envelopes. VSCF can be used on virtually any surface, with no threat to the health or safety of the user. The matte surface of the VSCF is also less reflective than that of ESDL film and photographs well with less specular highlights. Because of the affordability and ease of use, it may also be likely that the use of VSCF for lifting and preserving dust impressions at crime scenes may result in more footwear and tire track evidence being collected and preserved. Examinations and comparisons may also yield more favorable results because of improved detail and contrast when VSCF is used to collect and preserve dust impressions.

For further information, please contact:

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Greeley, Co. 80631
jlemay@co.weld.co.us

References


**Appendix**

Instructions to Participants

The purpose of this study is to test vinyl static cling film as a practical method for the lifting of dust impressions at crime scenes and in the forensic laboratory. We will be using the vinyl static cling film and electrostatic dust lifters (ESDL) to lift dust footwear impressions off of various surfaces. We will be storing these impressions in a variety of methods and photographing them at numerous time intervals.

Gelatin lifters will not be used in this study mainly due to the expense involved. It may not be practical or even possible for our departments to purchase additional gelatin lifters for the study, and the fact that dust impressions on gelatin lifters deteriorate over time is well documented (Bodziak’s book, second edition, page 122).

It is my hope that in the end we will have validated a simple, practical, and inexpensive method for the recovery and storage of dust impressions. This will take some time and effort on your part, and your participation in the study is greatly appreciated.

- Jan LeMay

**Part I**

Creating the Impressions

Create one pair of dust impressions on the following surfaces using the same pair of shoes for each set of impressions:

- Metal – room temperature
- Metal – hot (vehicle hood in sun or equivalent)
- Metal – cold (place in refrigerator/freezer for one hour)
- Painted or finished wood
- Bare wood
- Plastic
- Glass
- Paper
- Vinyl or linoleum flooring

1. Clean the surface with a damp, lint-free cloth.
2. Step on the surface wearing a rubber outsoled left shoe creating a dust impression.
3. Beside this impression, step on the surface with the right shoe creating a second dust impression. Leave enough space between the impressions for the lifting materials.
4. Photograph the impressions. If possible photograph it in a darkened environment. Use oblique light and a photographic scale.

**Part II**

Lifting the Impressions

For each test impression made by a left shoe, lift with the vinyl static cling film. For each test impression made by a right shoe, lift with the electrostatic dust lifter.

1. To lift with the vinyl static cling film, remove the white paper backing from the film. Gently place the film over the impression using the side which was in contact with the white paper backing. Hold it in place with one hand to prevent any slippage, or hold in place with a strip of tape. With the other hand, use a clean ink roller to smooth out the film and remove any wrinkles or air bubbles. Carefully turn over the sheet of film.
2. Using the electrostatic dust lifter, follow the manufacturer’s instructions and current department and laboratory procedures.
3. Fill out an adhesive label with your initials, date, and surface lifted from and place it on one corner of each of the lifts on the impression side.

4. Once each impression is lifted, photograph the lifter with the impression. Photograph in a darkened environment. Use oblique light and a black photographic scale.

Remember, as each lift is turned over, the impressions will be inverted. The left shoe lifts made with the vinyl film will appear as right shoes and the right shoe impressions lifted with the ESDL will appear as left shoes.

**Part III**

**Observations and Comparisons**

Relying on your training and experience, directly compare the two lifts off of each surface. Observe and compare the contrast of the lifts and the detail rendered in the lifts. Note any differences.

Our objective is to compare the quality of the vinyl film lift to the quality of the ESDL. Rate the difference using the following numerical system:

- **0** You observe no difference in the quality of the two lifts.
- **-1** You observe that the quality of the vinyl lift is slightly less than that of the ESDL.
- **-2** You observe that the quality of the vinyl lift is markedly (strikingly noticeable) less than that of the ESDL.
- **-3** You observe that the quality of the vinyl lift is very poor compared to that of the ESDL.
- **+1** You observe that the quality of the vinyl lift is slightly greater than that of the ESDL.
- **+2** You observe that the quality of the vinyl lift is markedly greater than that of the ESDL.
- **+3** You observe that the quality of the vinyl lift is much greater than that of the ESDL.

**Part IV**

**Storage Methods**

To compare the durability of the dust impressions on the two types of lifting films in storage, the two lifters of each type will be packaged differently, stored, observed, and documented at specific intervals to note any change in detail or contrast. Half of the lifts will be packaged in manila folders, which will be stored in paper bags. The other half will be stored taped down (and dust lift up) in cardboard boxes. It is preferred to use lined or coated cardboard boxes, as loose fibers in the cardboard boxes can cling to the lifters, thus distorting the impression.

1. Alternate packaging. Package a portion of the sheets of vinyl film in file folders and a portion in boxes. Do the same for the ESDL sheets.

2. Store in a location where they will be undisturbed.

After being stored for the specified period, remove the lifters and photograph them. Note any changes in your observations. Directly compare the impressions on the vinyl film to their counterparts on ESDL film. Rate your observations using the same scale as before, but note any difference from your previous rating in the additional column. For example, if your rating for the vinyl lift off of paper in your immediate observation was a +1, and after a period of storage your rating is a -1, the change is -2.

**Observation Tables** (1 each for initial, 3-month, and 6-month observations)

<table>
<thead>
<tr>
<th>Surface</th>
<th>Contrast</th>
<th>Detail</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal (room temp)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal (hot)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal (cold)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood (finished)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood (unfinished)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinyl floor</td>
<td></td>
<td></td>
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</tbody>
</table>
INSANE Evidence Packaging?

To view more insanity, go to LPinsanity.com.

For proper handling/packaging procedures, go to LynnPeavey.com.
Drug Trends: Synthetic Cannabinoids, Synthetic Cathinones, Salvia and Kratom

Amanda Kilgore, Drug Identification Section, Iowa DCI Crime Lab

You have to be living under a rock in Iowa these days to have not heard about synthetic cannabinoids, commonly referred to as K2 or Spice, and synthetic cathinones, commonly referred to as bath salts. While this drug trend is not exactly “new,” in the last year, awareness of these substances has expanded beyond the head shops, gas stations and adult book stores, where it was commonly sold, to police agencies, the crime lab and the capitol where both law enforcement officers and politicians are trying to figure out what to do about these substances. While we try to play catch up, new substances keep rolling out. We are now seeing a non-controlled substance called Kratom and a range of new non-controlled synthetic cathinones. At this stage in the game, the topic of these substances can be summed up in one word: confusing. What are these drugs? Are they legal or illegal? Can they be analyzed by the crime lab? Can you tell what they are by the packaging? And the questions go on and on. At the DCI Crime Lab we have been fielding these questions on a daily basis. While we have some answers, others will ultimately be determined by the courts and are yet to be known. It is my hope that this article will at least clear up the basics so let’s get to it!

What are Synthetic Cannabinoids?

A synthetic drug is a drug that is chemically synthesized, meaning that it is made by someone in a lab as opposed to coming from a plant. The active compound in the marijuana plant, delta-9-tetrahydrocannabinol, is a naturally occurring drug whereas the synthetic cannabinoids discussed here are drugs synthesized with the intent to mimic the effects of marijuana on the body. It is important to note that when synthetic cannabinoids are produced they are in powder form. The powder is then dissolved in a liquid such as water and this liquid can be sprayed on anything. Commonly, synthetic cannabinoids are seen sprayed on plant materials such as spices and potpourri blends. Because the plant substances are just the substance to spray the actual drug on, there is no uniformity in the appearance of these spice and potpourri blends. While the synthetic cannabinoids themselves, as a powder, do not have an odor, the plant materials they are sprayed on have their own scents. Synthetic cannabinoids are commonly packaged in foil packets with graphic designs and labels with any and every catchy name you can think of. Examples include: 100% Pure Evil, Judgment Day, Armageddon, Kush, Oblivion, Mr. Nice Guy, Big Bang and K2; just to name a few. They are sold under the guise of being “herbal incense blends” and “potpourri,” and are labeled as not being for human consumption thereby making it possible to sell the substances without FDA approval.

Can the DCI Lab Test For/Identify Synthetic Cannabinoids?

The answer to this question depends on if you are referring to drug identification (yes) or toxicology (no).
The Drug Identification Section of the laboratory is fully capable of identifying synthetic cannabinoids. When a suspected synthetic cannabinoid is sent in for drug analysis the plant material will be analyzed by soaking a portion of the sample in methanol to extract the synthetic cannabinoids from the plant material. This extract is then tested using gas chromatography and gas chromatography/mass spectrometry. As with all controlled substances that come into the laboratory, the compound found in a case sample is then compared to a known standard which has been purchased from a DEA licensed chemical company. For example, if a case sample is found to contain JWH-018, then a purchased known standard sample of JWH-018 is run through the same instrumental tests to prove that the results are the same for both the case sample and the known standard.

While there are reportedly hundreds of synthetic cannabinoid compounds, the DCI Laboratory has purchased standards of the compounds listed in Table 1. The illicit manufacturers of these substances are typically always going to be ahead of both the crime labs and the legitimate chemical companies when it comes to these substances. Because of this, only a fraction of the hundreds of compounds that have reportedly been synthesized for illicit use are available from the legitimate chemical companies who provide our standards. If a case sample comes into the lab for which we do not currently have a known standard for comparison, then we will purchase the standard as long as it is available. If no standard is available for purchase we will report the substance as being “consistent with” the compound found. Although the list of substances in Table 1 covers what we have been seeing in Iowa, remember that it is only a small portion of the synthetic cannabinoid compounds that are out there.

Table 1: Synthetic Cannabinoid Compounds Purchased by DCI Crime Lab for Case Sample Comparisons

<table>
<thead>
<tr>
<th>AM-2201</th>
<th>JWH-019</th>
<th>JWH-210</th>
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<td>CP 47, 497</td>
<td>JWH-073</td>
<td>JWH-250</td>
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<tr>
<td>CP 47, 497 homolog</td>
<td>JWH-081</td>
<td>JWH-251</td>
</tr>
<tr>
<td>HU 210</td>
<td>JWH-122</td>
<td>JWH-302</td>
</tr>
<tr>
<td>HU 211</td>
<td>JWH-200</td>
<td>RCS-4</td>
</tr>
<tr>
<td>JWH-018</td>
<td>JWH-203</td>
<td>RCS-8</td>
</tr>
</tbody>
</table>

As for the Toxicology section of the laboratory, currently we do not have the capability of analyzing synthetic cannabinoids in biological fluids. The body metabolizes synthetic cannabinoids, currently standards are not readily available for these metabolized compounds. The Toxicology section may be able to direct you to a private company that can analyze a limited number of these samples.

Can You Tell What Synthetic Cannabinoid is Present Based on the Packaging?

A common question we get at the laboratory is “We have a Spice package labeled (insert name here), have you seen it before and what did it contain/were its contents controlled?” Synthetic cannabinoids are packaged under hundreds of different names. Because there is no regulation over the producers of these products, there is no way of telling what the contents are based on the packaging. Some labels have company information listed on the package. Is that there because there is a large company with set standards who is sell-
ing that product or is that information there to make the product look more legitimate to users when in fact it was made by someone in their basement who bought a heat sealer, pretty sticker labels and some chemicals online? Did the producers have two different chemicals but only one set of packaging? Did they run out of one batch and fill the remaining pouches with a different batch? There is no way we can be certain that the same packaging in fact contains the same synthetic cannabinoid because the producers are not held to any standards or regulations and could be putting anything in those pouches. Because of this, all substances need to be sent into the laboratory for testing prior to charges being filed to determine if the product contains a controlled substance. These submissions will be analyzed as routine casework and will not be prioritized. We are not able to give information based solely on the name on the package.

**Which Synthetic Cannabinoids are Controlled?**

State of Iowa: For the time being, the best way to answer this question is to refer to the current statute which went into effect July 29th, 2011. In regards to synthetic cannabinoids, Iowa Code Section 124.204 as amended by 2011 Iowa Acts Senate File 510 says:

“Any substance, compound, mixture or preparation which contains any quantity of any synthetic cannabinoid that is not approved as a pharmaceutical, including but not limited to the following:"

The following substances are then listed as Schedule I controlled substances with their chemical names: CP 47,497 and its homolog, HU-210, HU-211, JWH-018, JWH-073 and JWH-200.

While the wording is all encompassing, the list is brief. Which leads to the question: Are they all illegal or just the ones listed? This is where we have to defer to the courts to decide the answer to this question. Work is being done to change the law to make this list more encompassing so that there is no confusion. Until that time it will be up to the county attorneys to decide what they are going to prosecute and it will be up to the courts to interpret the law as it is currently written.

Federal: Federal law has only gone so far as to emergency schedule a handful of these substances. On March 1, 2011, the following substances were temporarily scheduled as Schedule I controlled substances: CP 47,497 and its homolog, JWH-018, JWH-073 and JWH-200. HU-210 and HU-211 were already Schedule I controlled substances. Legislation is also in the works on the federal level to schedule a more inclusive list of synthetic cannabinoids.

**What are Synthetic Cathinones?**

Synthetic cathinones are central nervous system stimulants that are commonly distributed in powder, crystal, liquid, tablet and capsule form. They share many similarities with the Schedule I & II stimulants methamphetamine, MDMA, cocaine, cathinone and methcathinone. They are falsely marketed as commercial items such as bath salts, plant food/fertilizer, pond cleaner, insect repellant,
vacuum fresheners and research chemicals. Like synthetic cannabinoids, they are sold in head shops, gas stations, adult book stores and on the internet. It is reported that abusers ingest, inhale, inject, smoke or snort synthetic cathinones to experience effects similar to those of amphetamine abuse. It is reported that they are also being abused for hallucinogenic effects.

Synthetic cathinones include but are not limited to 4-methylmethcathinone (mephedrone), methylene-dioxypyrrolvaleron (MDPV), methylone, butylone, 4-fluoromethcathinone (4-FMC), 3-fluoromethcathinone (3-FMC), 4-methoxymethcathinone (methedrone), 4-methyl-N-ethylcathinone (4-MEC), ethylone, buphedrone, dimethylcathinone, diethylcathinone, and 3,4-methylenedioxy-α-pyrrolidinopentiophenone (MDPBP). New substances continue to be illicitly manufactured as controls are placed on existing compounds.

Can the DCI Lab Test For/Identify Synthetic Cathinones?

The Drug Identification section of the laboratory is capable of testing for synthetic cathinones. These substances are analyzed by dissolving a portion of the sample in methanol and then running the sample using gas chromatography and gas chromatography/mass spectrometry instrumentation. Above I described how we compare a case sample to a known standard. As far as what is coming into our laboratory, synthetic cathinones are a newer trend than synthetic cannabinoids and we have far fewer purchased standards for synthetic cathinones. While we are able to analyze the sample, we may not be able to identify the substance due to a lack of these known standards. As the trend evolves the drug analysis community adapts as well. For now we are capable of identifying the synthetic cathinones which are controlled and we are making an attempt to purchase standards for other non-controlled compounds as we see them in casework and as they become available for purchase.

The Toxicology section of the laboratory can analyze synthetic cathinones in urine. However, the normal screening process used by the toxicology section does not look for these substances. Therefore it must be indicated on the laboratory receipt form that these compounds are suspected in the case.

How are Synthetic Cathinones Packaged?

We have seen synthetic cathinones come into the laboratory in packages labeled “bath salts” and we have seen these substances come in unlabeled plastic bags, in clear unlabeled capsules and in tablets similar to those containing MDMA. These substances have also been seen sprayed on herbal/potpourri blends with synthetic cannabinoid substances. Packaged products usually are labeled “not for human consumption” and are sold under names such as Ivory Wave, Vanilla Sky, White Rush and Tranquility, among others.

Unlabeled samples in plastic bags and clear capsules have had appearances ranging from a fine white fluffy powder to an off-white crystalline appearance. The crystalline substance has been small and granular as opposed to the larger meth crystals we are used to seeing. The crystalline substance can be mistaken visually for MDMA and possibly crushed methamphetamine crystals. Compounding this problem is the fact that the Nitro Prusside field test kits turn blue with methamphetamine, turn blue with MDMA and turn blue with the synthetic cathinones we have seen. A better approach to screening in the field would be to use a Marquis field test kit. This test kit turns orange with methamphetamine, black with MDMA and a neon yellowish-green color with synthetic cathinones.
We have had numerous exhibits of ecstasy-like tablets which contained synthetic cathinones either by themselves or in combination with MDMA and/or BZP.

**Which Synthetic Cathinones are Controlled?**

State of Iowa: Iowa Code Section 124.204 as amended by 2011 Iowa Acts Senate File 510 controlled both mephedrone and MDPV as Schedule I controlled substances on August 28, 2011. As with the synthetic cannabinoids, illicit manufacturers have produced and continue to produce numerous substances that are currently not controlled.

Federal: On October 21, 2011, the federal system emergency scheduled three synthetic cathinones as Schedule I controlled substances. These three compounds are mephedrone, MDPV and methylone. This emergency scheduling is in effect for a minimum of one year. Legislation is in the works on the federal level to schedule a more inclusive list of synthetic cathinones.

**What is Salvia and is it Controlled?**

Salvia divinorum is a perennial herb in the mint family native to Mexico. The plant can grow three feet tall, has large green leaves and white and purple flowers and is grown domestically and imported from Mexico and South and Central America. The active ingredient in the plant is salvinorin A, which has hallucinogenic properties. Salvia is sold as seeds, plant cuttings, whole plants, fresh and dried leaves, extract-enhanced leaves of various strengths (5x, 10x, 20x, 30x), and as liquid extracts containing salvinorin A. Commercial products are sold in head shops, gas stations, adult book stores and on the internet as a legal alternative to controlled hallucinogens. The Drug Identification section of the laboratory is able to identify samples containing salvinorin A, the Toxicology section of the laboratory is not able to analyze salvinorin A in biological fluids.

On August 28, 2011, both salvia divinorum (the plant itself) and salvinorin A (the active ingredient) were added as Schedule I controlled substances under Iowa Code Section 124.204 as amended by 2011 Iowa Acts Senate File 510. Federally these substances are not controlled.

**What is Kratom and is it Controlled?**

Mitragyna speciosa Korth is a tropical plant indigenous to Thailand and Malaysia. In Thailand the leaves of the plant are called “kratom,” while in Malaysia they are called “ketum.” A paper on kratom, published by the Malaysian Forensic Division Department of Chemistry, says kratom leaves have been used in their native countries for their opium-like effect and their coca-like stimulative properties. It is reported that the leaves are used by native healers to wean addicts off heroin, to deworm, to cure diarrhea, to improve circulation and even to treat diabetes. A study conducted in Thailand in 1975 showed that kratom users became addicted to the substance. The paper states that a wide variety of kratom products are available on the market, including dry crushed leaves, powdered leaves and drinks. The active ingredient in the plant is a substance called mitragynine.
We have only seen a few samples of this substance in Iowa thus far. These samples came in foil pouches similar to those containing synthetic cannabinoids and were labeled Kratom. The following information was listed on a Kratom pouch: “Directions for use: Mix content of package with 4-6 oz of your favorite fruit juice beverage. Effects will last 2-4 hours.” The phrase “not for human consumption” was on the same package. The samples in Iowa were seized in the raid of an adult book store along with a large number of synthetic cannabinoids and salvia. The active ingredient, mitragynine, is not controlled in the state of Iowa or federally. As more control has been placed on synthetic cannabinoids, synthetic cathinones and salvia, this substance may start showing up as a new “legal high” alternative.

References:


3. U.S. Department of Justice, Drug Enforcement Administration, Office of Diversion Control, Drug and Chemical Evaluation Section. 2011. Background, Data and Analysis of Synthetic Cathinones: Mephedrone (4-MMC), Methylone (MDMC) and 3,4-Methylenedioxypyrovalerone (MDPV).


5. Chan KB, Pakiam C, Rahim RA. Psychoactive plant abuse: the identification of mitragynine in ketum and in ketum preparations. Forensic Division, Department of Chemistry, Malaysia.

Internet Links/Resources

Check This Out: CRIME-LITE® SMART PHONE APP

CODIS Information from the Iowa DCI Crime Laboratory
DNA Related Topics
Most of you who receive this newsletter and work in our line of work don’t watch the “CSI” shows on television. You’re probably unlikely to admit it even if you do. I’m sure most would admit though that every once in awhile, as you’re channel surfing turns up empty, you pause at one of the multitude of CSI shows for just a moment of comic relief. With budgets they way they are today, maybe you watch them and mark it down as training. I’m sure you’ve noticed that without fail the Crime Scene Investigator you are watching locates a piece of evidence that is paramount to the case. I’m guessing this scenario happens on a weekly basis or no one would watch it. We on the other hand roll our eyes, make a snide remark and begin our search for yet another mindless television show to watch.

Sometimes while we are investigating a real crime scene we come up with that one “TV show” piece of evidence that’s going to make a difference. That is a great feeling! While it happens much less frequently in real life, it’s rewarding nonetheless to have that kind of success in our job. I’m a golfer so I can relate evidence collection to golf. Actually, I can relate anything to golf but I’ll try to keep to the point. Some golfers are better than others which goes without saying. Regardless, every golfer loves making a good shot just like crime scene investigators love finding good, solid, probative evidence. Sometimes the good shots are purely luck but more often than not, they are from training, experience or just plain old practice.

We are all looking for that one good shot, or trying to locate that one good, solid piece of probative evidence. In late September of 2010 the Ankeny Police Department found just that. We were called to the Taco John’s at 319 S. Ankeny Boulevard in regards to a robbery at 0530. The witness stated that she had just exited her car on the east side of the building when two suspects, armed with a gun, ordered her to open the rear door of the restaurant. The victim began screaming instantly and ran westward past the Taco John’s restaurant she was ordered to open only moments before. One of the suspects stood ground near the victim’s car continuing to point the weapon at the suspect. The other ran eastward into a residential neighborhood and was soon followed by the armed suspect.

Both suspects were wearing dark colored ski masks, dark hooded sweatshirts and dark pants. According to the victim, both suspects were between 5’9” and 5’11” in height. One was skinny, the other heavy. One was carrying a backpack, the other a handgun. Immediately after the incident the search for the two suspects began. The Polk County K-9 unit was contacted to assist but was unable to locate the suspects. A Deputy identified two young males walking down the sidewalk at approximately 0730. They matched the physical characteristics but neither were carrying a backpack nor were they dressed as described by the victim. The two young men, having a documented history, were transported to the Ankeny Police Department and interviewed.

Meanwhile, the scene at Taco Johns was processed for any physical evidence that might lead to the identification of a potential suspect. Partial shoe impressions were discovered
heading eastbound, consistent with the path of travel of the two suspects. These partial impressions were photographed, cast using Traxtone and collected for comparison. While processing the scene at Taco John’s, officers continued to search the neighborhood for any other suspects. Officer Wasko of the Ankeny Police Department located a backpack hidden inconspicuously along the side of a shed approximately 3 blocks from Taco Johns. The shed was about 24” from a fence which ran along the east side. The backpack was left untouched until the area could be documented and processed for further physical evidence.

There were several partial shoe impressions leading into the 24” crawl space. The backpack, nearly two feet in from the corner of the shed, was removed and searched. It was clear, based on the contents of this ominous backpack, that we had discovered a direct link between our suspects and our robbery. The contents of the bag included ski masks, dark sweatshirts, dark pants and a Crossman Airgun.

Now, many robbery suspects we’ve encountered in our career shed clothes, throw on a hat or a coat or they neglect to do anything at all to change their appearance. They just walk away…or run. The suspects in this case chose to pack their get-away clothing and change in their car…brilliant! The problem, their getaway car was locked, and the keys were inside it…not so brilliant. Having locked their keys in the car they apparently felt welcomed by the smiley face painted on the back side of the shed seen in figure 1, as this is where they would hunker down for the next couple of hours.

We had a pretty good description of the suspects, we had two suspects in interviews that fit the physical description, and we had a backpack with contents consistent with our victim’s statement of how they were dressed.

As I examined the 24” wide path alongside the shed I notice two indentions in the ground. I bent down carefully to look closer at the indentions. To my advantage it was an area where the grass was shaded a majority of the day so the ground was almost always damp, the blades of grass were thin and the grass coverage on the ground was even thinner.

Initially I thought the indentions, which contained a lined pattern, were impressions from blue jeans. However, after a closer look, the indentions appeared to contain fingerprints (Figure 2 and Figure 3). Fingerprint impressions in the mud…really? This might just be that one good shot, a real
television CSI moment.

I photographed and photographed and photographed the impressions. While it was challenging to get a good image due to the depth of the print, grass creating shadows at every angle, and the awkward location, the photos ended up showing a significant amount of detail. The challenge was deciding how to lift fingerprint impressions in mud. I know for a fact that I’ve never been trained or read an article about how to do that. I already had the Traxtone out earlier in the day for the shoe impressions and I was going to use it again for the shoe impression alongside the shed. I just had a gut feeling that using the traxtone in this situation was not the best technique to use. I really thought it would just wash away the ridge detail like overdoing it with the fingerprint brush on a print dusted with black powder. It may have worked just fine but I didn’t want to take that risk.

I decided to use Polyvinyl Siloxane (PVS). It’s great for lifting tool mark impressions, dusted latent prints and a number of other things so it became the best option. Before I filled the fingerprint impression with PVS I wanted to test the PVS out and see if it would even work. I tried making several fingerprint impressions in the mud but was unable to recreate the ridge detail seen in the two impressions.

Knowing that I had some pretty good photos I carefully filled the impression with the PVS casting material making sure it filled the entire indentation. I allowed it to set for approximately 5 minutes making sure it was completely cured before attempting to remove it. I removed the casting and to my surprise I discovered that PVS also works remarkably well for lifting fingerprint impressions in mud.

The photos and PVS casting of the fingerprint impression in mud were sent to the DCI for comparison to the suspects found walking in the area that late September morning. With credit to our detectives assigned to the case one of the suspects rolled on the other like a tire rolling down a hill but I was still eager to find out if the print, the one good shot, was identifiable.

Near the middle of October I received a phone call from Denny Kern, Criminalist with the DCI Crime Laboratory. Kern wanted to know what the story was behind the impression so I briefed him on the details of the case. He informed me that both PVS castings were suitable for identification. Needless to say I was thrilled. After taking photos of the impression (Figure 4 and Figure 5) he was able to identify the latent prints as the right index and right middle fingerprints of one of the suspects arrested for the robbery. Kern stated that he was able to clearly see more detail in the cast than in the photographs I had taken. The contrast in the cast had confirmed the difference between real ridge details and artifacts from the dirt. And with that, my one good shot just turned into a hole in one!
97th IAI International Educational Conference
Phoenix 2011
Phoenix, AZ
July 22-28, 2012
For more information go to:
http://www.theiai.org/conference/2012/index.php

Iowa IAI Educational Conference and Business Meeting
May 2-4, 2012
Cedar Falls, Iowa
For more information for to :
www.iowaiai.org

American Academy of Forensic Science
64th Annual Scientific Meeting
Global Research: The Forensic Science Edge
February 20-25, 2012
Atlanta, GA

Institute of Police Technology and Management
Advanced Sexual Assault and Crime Scene Processing, 5/2-5/4
Bloodstain Interpretation, 4/16-4/20
Crime Scene Reconstruction of Shooting Incident, 5/21-5/25
Omaha, Nebraska
Go to the IPTM website for more details
www.IPTM.org

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Iowa IAI Basic and Advanced Crime Scene School
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Bullcoming v. New Mexico which held that a forensic science witness cannot, consistent with the U.S. Constitution, testify to the analysis of another individual. In short, the Court held that it was necessary for a witness to have personal knowledge of the analysis that was conducted, not to simply read another’s report. Allowing the introduction of testimony against the defendant without the defendant being able to cross-examine the witness who performed the analysis violates the defendant’s confrontation rights under the Constitution.

The defendant objected to the testimony on the grounds that the identification should have been testified to by the scientist at the company which performed the testing. There was no way to question the prosecution’s witness about the specific details of the testing or the possibility of a mistake or deliberate falsehood. The trial court and the state supreme court rejected these challenges. The U.S. Supreme Court granted review of the case to decide how far Bullcoming goes.

The likely response from the Court will be to prohibit an expert from simply testifying to the work of others. Although it is dangerous to predict the outcome of a case from questions at oral argument, it appears that a majority of Justices believe that the prosecution went too far in offering the critical component of the evidence (that it was the defendant’s DNA in the semen sample) through a witness who had no direct involvement in determining that very fact.

Williams VS. Illinois
-Testifying to the Contents of Another Analyst's Report-
Alan Ostergren, Muscatine County Attorney

.....the prosecution will be required to produce many, or perhaps all, of the witnesses involved in gathering data which underlies an expert’s opinion.
If the case is decided as is expected, the prosecution will be required to produce many, or perhaps all, of the witnesses involved in gathering data which underlies an expert’s opinion. For example, a pathologist will likely not be able to testify over objection to the deceased’s blood alcohol level (unless the doctor performed the test herself). Cases like Bullcoming and Williams will make it even more difficult and time-consuming to present forensic evidence. The cases also present difficult questions to methods of proof in cold homicides or other cases where investigative work was done by an analyst who has since died.

It is not clear from the oral argument transcript whether the Court will decide that everyone involved in the testing process will be required to testify or if a subset of witnesses will be sufficient. The Court could also avoid that question and simply decide that this witness’s testimony violated the confrontation rights of the defendant and leave for another case a decision on what number (if any) of witnesses short of everyone involved in the analysis would be sufficient.

The Constitutional questions presented by the nuances of proving up a DNA report should remind us all of the continued value of identification techniques such as latent print comparison. Although DNA identification has many advantages it places a subsequent expert witness in the position of being forced to simply accept the work product of others to provide testimony. In contrast, a latent print examiner can simply look at the original latent and inked prints to make an identification. Older identification methods, although arguably “less scientific” than DNA, retain advantages when the identification can be quickly replicated.

Cases like Bullcoming and Williams should also be considered by law enforcement executives who plan backlog reduction projects. Although exchanging a room of unexamined evidence containers (and a check) for a stack of reports is appealing, it may leave prosecutors unable to make use of the knowledge which has been generated. Backlog reduction projects should be designed so that evidence can be reexamined by a local witness if a trial is necessary. If this is not done then the company providing the backlog reduction must also be prepared to provide an appropriate witness in a timely and affordable manner.

It should be noted that these additional hurdles to offer scientific evidence will be felt by only the prosecution. The Federal and Iowa rules of evidence allow expert witnesses to rely upon inadmissible information so long as the information is of the type typically relied upon by experts in their field. A defense DNA expert, for example, can testify that the defendant’s DNA is not present and buttress that testimony with a report from an outside lab. Bullcoming and Williams are Constitutional decisions and limit only the prosecution.

Constitutional rules of criminal procedure are often difficult to apply. This is deliberate. These rules are designed to further our society’s value judgments about how much power the government should have to convict individuals of crimes. To an honest, knowledgeable, and thorough law enforcement officer they may appear unnecessary – and perhaps they might be. The rules are designed, however, to prevent unjust convictions from being caused by the dishonest, ignorant, and lazy. Cases like Bullcoming and Williams may change how forensic scientists do their work but the challenges are not insurmountable. The end result will be forensic evidence which is presented in a defensible and Constitutional manner.
Notes:
Iowa Division of the International Association for Identification
www.iowaiai.org