I.A.M.A.
International Association forMicroAnalysis

December 26, 2003
Volume 4 Issue 3

A NEWSLETTER FOR FORENSIC EXPERTS IN MICROANALYSIS

Forensic Application of Elastomers and Polyurethane by Michael Martinez

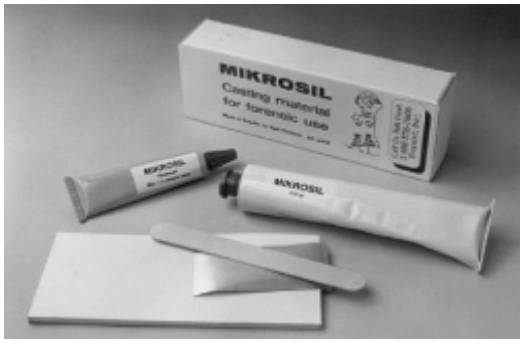
In 1998, our resident Forensic Odontologist introduced me to a new forensic casting technique for the comparison of bitemarks, which involves creating serial cast impressions using vinyl polysiloxane and polyurethane cast materials. The technique addressed an inherent problem examiners faced when comparing single cast impressions: since a cast impression is a negative of an item's surface, a skilled examiner must mentally invert the unique minute artifacts to compare the cast with the known. Examiners have used computer programs, such as Adobe Photoshop, to create digitally enhanced images of the inverted questioned markings and then overlay them onto the known item. However, this workaround introduces several disadvantages including the loss of depth from flattening the image, the need for multiple images at various lighting conditions to compensate for image flattening, and the loss of a side-by-side microscopic comparison of the items. This new serial casting procedure alleviates these limitations and incorporates one significant advantage: replication of the item in question without destroying any of its original features. Examiners can use the procedure on a wide range of items commonly collected at crime scenes, such as bite marks, toolmarks, firearms cartridge casings, footwear impressions, and fingerprints. Furthermore, this method also works surprisingly well at preserving minute details when the final cast is viewed under a scanning electron microscope (SEM).

Polymerized Silicone

For several years the preferred method for creating casting impressions from various items recovered from crime scenes has been the use of polymerized silicone elastomers (silicone rubber). Silicone rubber is an ideal casting material because of the ease of use, relative low cost, broad applicability to numerous types of forensic evidence, and accurate replication of microscopic details. The silicone rubber casting materials are commonly two component compounds, the silicone polymer and a catalyst, which when mixed together change from a fluid to an elastomer through the process of polymerization. The curing process of silicone (polysiloxane) is considered to be condensation-based and exothermic, resulting in the production and liberation of a water molecule and an ethanol molecule per chain link.

The most common brand of polysiloxane used in forensics is Mikrosil® a polydimethylsiloxane with the catalyst alkyl silicate (Figure 1).

Figure 1



(Continued on page 2)

Inside This Issue

Special Points of Interest:

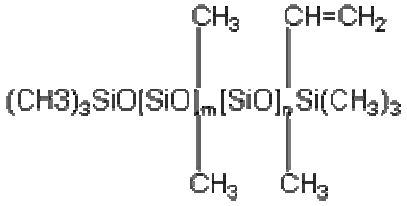
- **IAMA 5 Year Anniversary 2004**
- **Yahoo Forensic User Groups**
- **Call For Papers!**
- **Upcoming Meetings**

(Continued from page 1)

An alternative and better class of polysiloxane elastomers that proves excellent for forensic purposes is the vinyl functional copolymers. These copolymer elastomers are more costly but are well worth the price when precision and accuracy are critical factors. Vinyl functional copolymers can be purchased in differing viscosities depending on their application. Generally the viscosities are classified as light, medium, and heavy. Different colors have also been recently introduced to the market place.

The generic structure of a trimethoxy terminated vinylmethyl, dimethyl silicone copolymer is represented in Figure 2.

Figure 2



Additional advantages of producing elastomers using vinyl functional copolymers include increased toughness, increased tensile strength, increased dimensional stability, and reduced glossiness. The most widely used catalyst systems are solutions or complexes of chloroplatinic acid in alcohols, ethers, divinylsiloxanes, or cyclic vinylsiloxanes. In two-part formulations, the A component usually contains 5-10 ppm platinum and vinyl containing siloxane. The part B component usually contains a hydride functional siloxane and a vinylsiloxane.

These products are primarily used in dentistry and include the proprietary products Hydrosil®, Reprosil®, Polyjel®, Rite-Dent®, Mega-Sil®, Silasoft®, Examix®, and Quickfloaters®. One advantage of using products designed for dentistry is the precision dispensing of the mixed compound possible with a gun equipped with premixing tips and cartidges as shown in Figures 3a and 3b.

Figure 3a

Gun dispenser to control the equal distribution of Vinyl Polysiloxane.

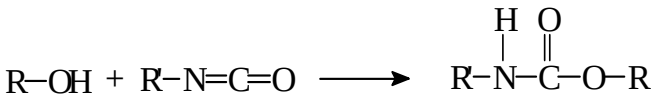
Figure 3b

Vinyl Polysiloxane cartridges and mixing tips.

Polyurethane

Liquid polyurethane casting resin has been used in a variety of different products over the years because of its short hardening time and enormous tensile strength. Polyurethane is also a favorite amongst hobbyists for another important characteristic: its incredible ability to pick up minute details – also ideal for forensic purposes. Polyurethane is a generic term referring to the repeating unit of -NH-CO-O-. This repeating unit is a result of the reaction of an isocyanate functional group with a hydroxyl group as shown in Figure 4.

Figure 4



There are several brands of polyurethane resins. The brand selected here is known as Por-a-Kast®, which is widely available in many hobby and craft stores. Por-a-Kast® is a thixotropic fluid, which like ketchup or latex paint, has a very high viscosity (relatively solid) when moving at low velocity (as when left standing) and a low viscosity (relatively fluid) when moving at a higher velocity, as when shaken or stirred. It is purchased as a two part MDI (an aromatic isocyanate diphenylmethane 4,4' diisocyanate) gel polyurethane system that is mixed one-to-one by volume and cures at room temperature to a lightweight, rigid, and off-white urethane. It is sufficiently viscous to be applied with a brush or trowel and is excellent as a vertical encapsulating compound and *in situ* projects material (Figure 5).

Figure 5

Procedure

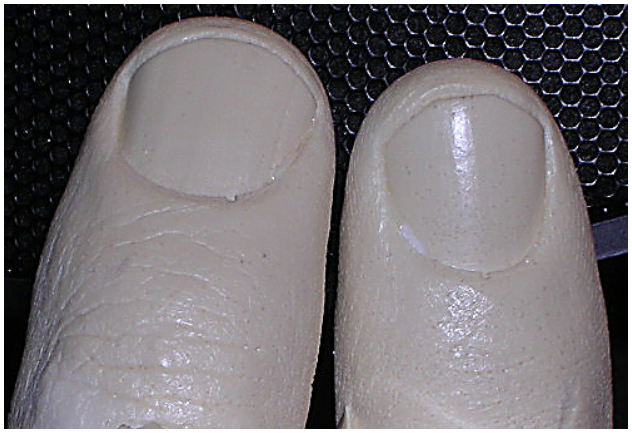
The procedure for creating a casting impression is quite simple and is described as part of the instructions of the products. However, slight modifications were necessary. A mold container is made with a cut

(Continued on page 3)

(Continued from page 2)

paper cup placed around the area or item to be cast. Once the vinyl polysiloxane (Hydrosil®) is allowed to set (only a few minutes), the mold is removed from the item. Next, a cast of the vinyl polysiloxane mold must be made by mixing and pouring the polyurethane resin (Por-a-Kast®) over the vinyl polysiloxane mold. The polyurethane is allowed to set (once again only a few minutes). Figure 6 is a practice casting of my right index and middle fingers using the above described technique. The fingerprint details were accurately preserved. (Unfortunately, I am unable demonstrate in Figure 6 the detailed fingerprint minutiae present because of the limited resolution of my camera.)

Figure 6



Index finger and middle finger final polyurethane cast

The final polyurethane cast can now be measured or viewed directly under a scanning electron microscope. However, when the examiner views the polyurethane cast in a high vacuum SEM, the examiner must exercise care to avoid charging. I use an aluminum boat to cradle the sample and thereby ground the cast to the stage assembly to eliminate the majority of electron charging. The examiner must also reduce and adjust the spot size and the accelerating voltage to provide the best electronmicrograph.

Conclusion

The dual casting method described is straightforward, is precise, and offers a forensic examiner an additional simple technique for the accurate examination of forensic evidence. The most significant finding is the preservation of minute details in the polyurethane cast impression that are stable when viewed in the SEM.

References

http://www.brian-jones.co.uk/puchem.shtml
http://www.evidentcrimescene.com/cata/cast/cast.html
http://www.fluorochemsilanes.co.uk/vinyl%20functional%20siloxanes.htm

A special thank you to David Senn, DDS
University of Texas Heath Science Center School of Dentistry.

Michael V. Martinez
Trace Evidence Supervisor
Bexar Co. Criminal Investigation Laboratory

Call For Papers!

At IAMA, we are committed to providing our subscribers with information that is timely and beneficial, and we welcome any suggestions for topics or articles. In addition, we are always looking for abstracts, papers and/or articles from our subscribers regarding research projects, proposals, interesting case studies, etc. If you have something you would like to see published in the upcoming newsletter, please contact:

Michael V. Martinez
webmaster@iamaweb.com
(210) 335-4117 office
(210) 335-4101 fax

Antimony Coats Many .22 Caliber Bullets - by Bryan Burnett

In 1997, Zeichner et al. reported the presence of antimony on bullets for a number of .22 ammunition produced by different manufacturers. Antimony was noted to be a detectable on 50% of the .22 bullets examined by Wrobel et al. (1998) in Australia. Federal, Winchester and Remington .22 bullets were observed by the author, like many of those .22 ammunition available in Australia and Israel, to show the presence of antimony with analyses by energy dispersive X-ray spectroscopy (EDS) in the scanning electron microscope (SEM). Is this antimony on a surface layer or is it throughout the bullet? Zeichner et al. (1997) reported that the antimony for the .22 bullets they examined is found on the surface of the bullets. The purpose of this contribution is to confirm that US .22 ammunition have bullets with surface antimony. Antimony from this source likely contributes to that found in gunshot residue (GSR).

The nature of the antimony association with .22 bullets can be ascertained by a simple razor blade swipe of a bullet. The bullets were examined in the SEM with EDS on the razor blade scrapes and the undamaged bullet surface. Results on two of these bullets, Federal and the brass-coated Peters are shown in Fig. 1. It is apparent for these ammunition and the .22 Winchester Wildcat (not shown) that the antimony is associated with a layer on these bullets. Antimony was not detectable from the X-ray samples from the razor blade scrapes. Thus, the interior of the bullets have a lower concentration (if any) of antimony than that of the surface.

Zeichner et al. (1997) report for ammunition with lead-barium primers that "only a small percentage (not more than 2%) of the [GSR] particles containing at least lead and barium were found to have also a considerable concentration of antimony" for those ammunition with an antimony-rich surface layer on the bullets. Wrobel et al (1998) state, "the projectile composition is probably less important than the primer…" in GSR. The latter authors did not provide supportive data. Although the results of my GSR analyses will not be furnished at this time, a future paper (likely to be published in the IAMA Newsletter) will re-examine the issue of the contribution of bullet antimony to .22 caliber GSR.

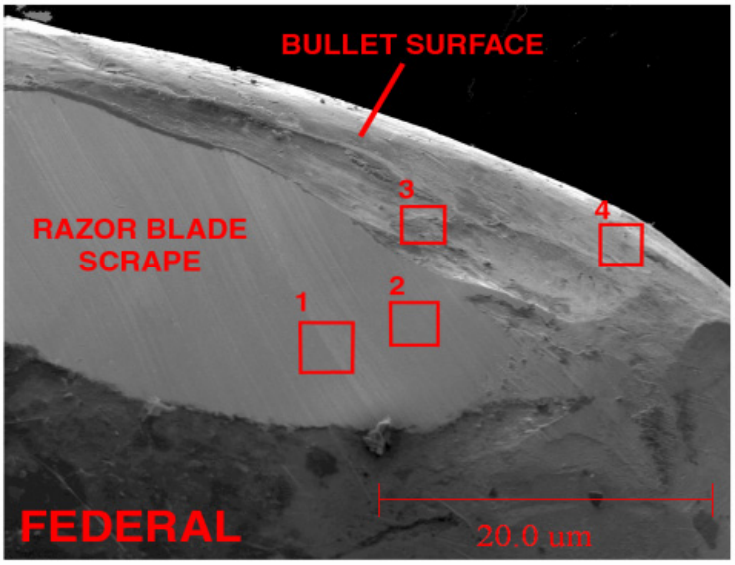
Refer to following page for diagrams.

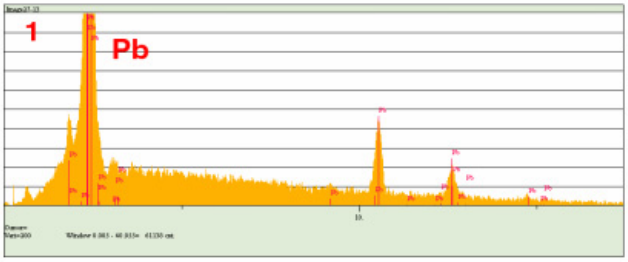
My thanks again go to Dr. Jozef Lebiedzik of Advanced Research Instruments for his helpful comments on a previous version of this submission.

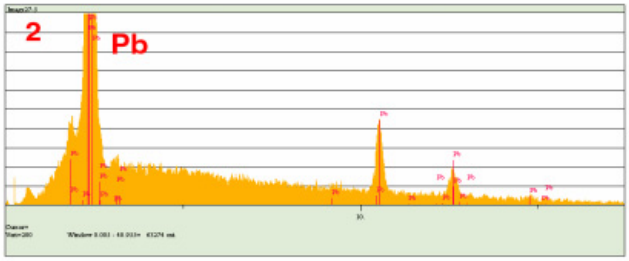
References

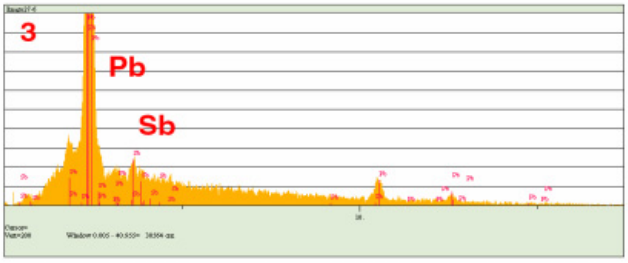
1. Wrobel, H.A; Millar, J.J. and Kijek, M. 1998. Identification of ammunition from gunshot residues and other cartridge related materials-A preliminary model using .22 caliber rimfire ammunition. J Forensic Sciences 43(2):324-328.
2. Zeichner, A.; Schecter, B. and Brenner, R. 1997. The possibility of finding gunshot residue (GSR) particles containing antimony in the firing of ammunition having antimony-free primers. Scanning 19(3):182-183.

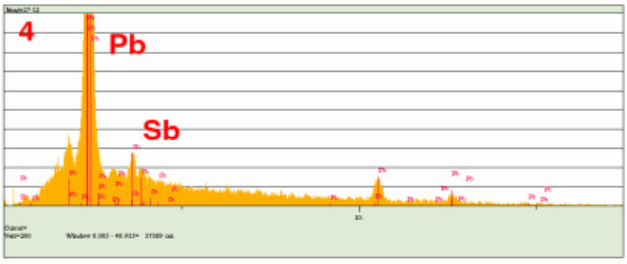
Bryan Burnett
Meixa Tech
1624 Debann Road, Building B
Cardiff, CA 92007
bryan@meixatech.com

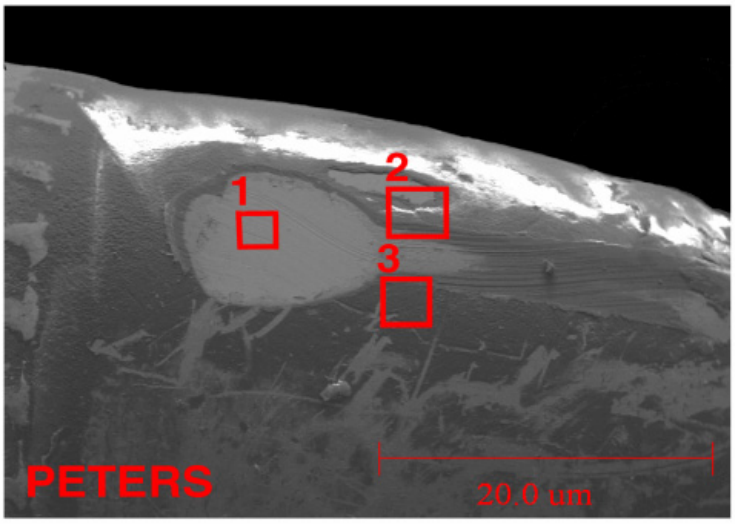

BULLET SURFACE
RAZOR BLADE SCRAPE
1
2
3
4
FEDERAL
20.0 um

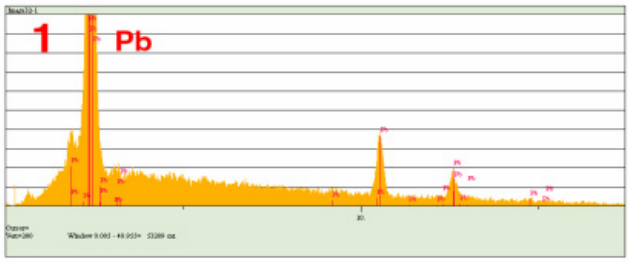

1
Pb

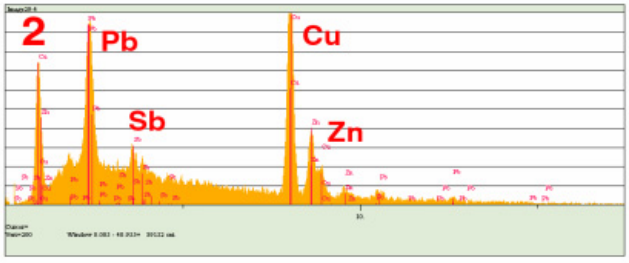

2
Pb

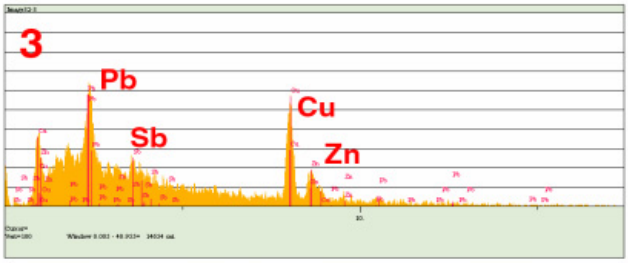

3
Pb
Sb


4
Pb
Sb


1
2
3
PETERS
20.0 um


1
Pb


2
Pb
Cu
Sb
Zn


3
Pb
Cu
Sb
Zn

About the Use of Digital Single Lens Reflex Cameras on Microscopes - by Jan Hinsch

For micrography a choice between dedicated microscope cameras and single lens reflex cameras (SLR) has long been available. This choice exists not only for film based but digital documentation as well.

For some time I have experimented with a digital SLR (DSLR) on my microscope and found it to be a valuable instrument for taking satisfying, well resolved, micrographs (Figure 1).

In contrast to many of the dedicated microscope digital c-mount cameras, which typically are tethered to a computer, the use of a computer with a DSLR is optional. In regard to portability this is obviously an advantage. But it is also a liability because the use of a computer is limited to viewing and editing the images *after* capture, whereas the dedicated digital microscope camera offers convenient ways of enhancing images before they are ever recorded. This paper deals with some of the specifics of a DSLR that must be considered to take advantage of its capabilities. My point of reference is a Fuji Finepix S2 Pro. I limit this article to the generalities applicable to any DSLR or SLR for that matter.

Figure 1. *Microscope manufacturers typically offer their own SLR adapters. This one is made for Leica microscopes. A cylindrical sleeve connects the photo eyepiece (8x or 10x) to the camera lens (0.32x). As long as the eyepiece is of the type that matches the correction characteristics of the objectives, optimal optical performance and parfocality are assured.*

Typically, today's DSLRs are built around proven SLR bodies where, after pressing the release button, the mirror flips up and the focal plane shutter exposes the chip for the chosen length of time. A connector tube joins camera and microscope rigidly, and that can be a problem. The motions of mirror and shutter cause the microscope to vibrate so that the microscope objective moves relative to the specimen. If that motion were just a micron in the specimen plane the magnification may amplify it 1000 times or more when it is displayed on the computer screen or print. This causes blurred images with all except low magnifications. Experiments show that locking up the mirror does not solve, or even significantly reduce, the problem. There are two proven remedies that I know of:

1) Use of long exposure times. The vibration that occurs when the shutter opens lasts for about 1/30 second. If the exposure time is long relative to that, the initial vibration becomes insignificant. I have methodically tested several SLRs and found an exposure time of 1 second or longer to be safe at any magnification.

2) Mounting the camera to a wall bracket with a gap between the camera and the microscope so that the two are not mechanically connected (Figure 2). This requires the use of a camera lens on the DSLR, which "looks" into the photo eyepiece of the microscope. The eyepiece projects an image at an infinite distance which the lens of the DSLR, set to infinity, "sees" it as if it were a distant landscape. This approach has several advantages:

1) It is immune to vibration problems.
2) It permits the use of a standard camera lens containing the necessary microprocessor to allow auto exposure.

Finally, it permits image reticles, cross lines, scales, grids, etc., which are installed in the photo eyepiece.

Figure 2 *DSLR Anchored to the Wall.*
In this arrangement microscope and camera are not mechanically connected at all. There is no vibration problem at any exposure time and the automatic exposure time setting is fully functional.

There is easy access to the eyepiece. That can be valuable whenever reticules are to be displayed together with the specimen.

How much of the field of view appears on the final image depends on the eyepiece magnification and the focal length of the camera lens. (See table)

The distance from the eyepiece to the camera lens does not affect the magnification or the focus. This distance is critical however to avoid vignetting and hot spots. Usually, high eye point eyepieces are more likely to be satisfactory, than the short eye relief variety, especially when zoom lenses are used.

Compared to the 35mm format the chip of typical DSLRs covers about 40% of the area. To capture the same field with a DSLR as with a 35mm SLR, either the magnification of the photo eyepiece or the focal length of the camera lens must be smaller by a factor of 1.6x. There are a couple of full frame (24 x 36mm) DSLRs made for very demanding uses to which this precaution obviously does not apply. On the opposite end there is the emerging Four Thirds standard for digital system cameras with chip dimensions of 18 x 13.5mm. Here the area is 28% of the 35mm format. The diagonal is exactly half that of the full frame 35mm format and to capture a comparable field the magnification then needs to be smaller by a factor of 2x.

This is a good place to consider the purpose of the photo eyepiece and camera lens. Together they control the size and magnification of the captured field. Present microscopes have field numbers (FN) of 20 to 25 mm. The FN is the diameter of the image in the intermediate image plane (IIP) that the eyepiece reveals. How much of that field is actually captured by the camera depends on the product of the magnifying power of the optical components following the IIP, which are the eyepiece and the camera lens. If the eyepiece were of 10x and the camera lens of 0.32x power, the product of the two, 3.2 would be the magnification of the intermediate image in the plane of the chip.

Now, the diagonal of a chip 15.5 x 23 equals 27.7 mm. 27.7 divided by 3.2 = 8.7. The chip diagonal represents a FN of 8.7mm. With an 8x eyepiece and camera lens 0.32 the product becomes 2.5. The FN increases to 10.9 mm etc. I usually would not attempt to capture more than FN 15 because larger fields, especially when low power objectives are used, contain an amount of information that may exceed the camera's resolution capabilities. Also the likelihood of shading increases with the FN. Shading is the technical term for a falloff in brightness toward the edge of the image.

Sometimes the eyepiece and camera lens are fixed, inseparable components of the photo adapter. Sometimes manufacturers omit the camera lens altogether by bringing the normally parallel rays emerging from the photo eyepiece to convergence in the camera's image plane by lifting the eyepiece out of its sleeve by a certain distance and sometimes that distance is already added to the eyepiece's shoulder which then should be called a projective. In all three scenarios it makes sense to engrave just the magnification that takes place between the IIP and the chip, 2.5 or 3.2 in our example.

Typically these microscope adapters end with a T-mount thread on the top. Additional conversion adapters are needed (available from camera stores) to change the T-mount into just about any camera-specific bayonet mount. The limitation of these adapters is, that they lack the microprocessor and electrical connections to activate the automatic exposure timing. While it is not difficult to determine the right exposure time by trial and error in manual mode, it is possible to restore the auto exposure function by using one of the lenses made for general use with the particular camera model. The aperture of the lens is set to its maximum f-stop and aperture priority chosen as the exposure mode. The magnifying power of a camera lens following the eyepiece can be calculated by dividing 250mm into the focal length. A 50mm lens, for example, has a camera lens factor of 0.2x. Conversely, the 0.32 camera lens mentioned a couple of paragraphs earlier has a focal length of 80mm.

Without the help of a machinist it is difficult to integrate that camera lens into a rigid connector. That is another reason why I like mounting method 2 mentioned earlier. This configuration also permits to alter within limits the distance between eyepiece and camera lens. That

(Continued from page 7)

may be desirable to avoid hot spots and, especially in the case of zoom lenses, to find a distance where eyepiece pupil and lens pupil share a common plane to eliminate, or reduce, vignetting. Generally, the longer the eye relief of an eyepiece is, the better. The rays emerging from the eyepiece form an hourglass-like cone, which can be made visible by letting the light graze a piece of paper (Figure 3). The vertical distance from the top of the eyepiece to the waistline of the hourglass is called the eye relief.

The auto-focus is not reliable in micrographic applications; it should be disabled.

A DSLR would not, under some circumstances, be my first choice on the microscope but as a workhorse for the widest range of uses on or off the microscope, it is indispensable and it would be a shame not to tap its

(Continued on page 9)

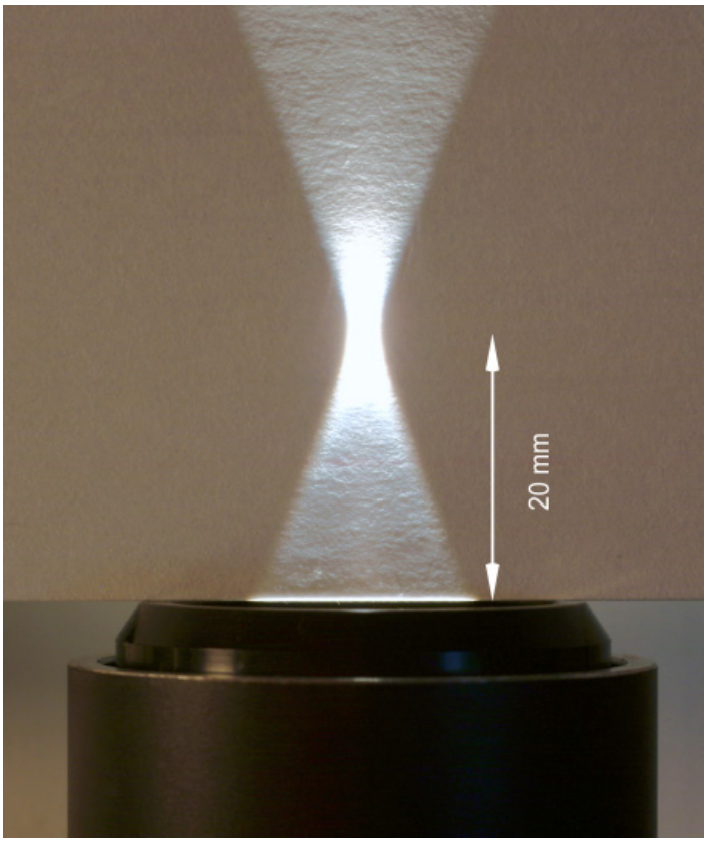


***Figure 3**. The rays that graze the surface of a piece of paper reveal the location of the eyepoint of an eyepiece. The distance from the rim of the eyepiece to the eyepoint is called the "eye relief". For use with camera lenses of multi element design and especially zoom lenses high eyepoint eyepieces usually are less likely to cause vignetting.*

This is the simplest kind of microscope adapter. The image is projected directly, without the intervention of a camera lens, into the camera's image plane. These adapters work and they are cheap. For parfocality with the binocular observation the eyepiece must be raised by an amount Zeyep.

$$Zeyep. = \frac{(250mm / Meyep)^2}{K}$$

Where K is the distance from the eye point to the image plane and Meyep the magnification of the eyepiece.

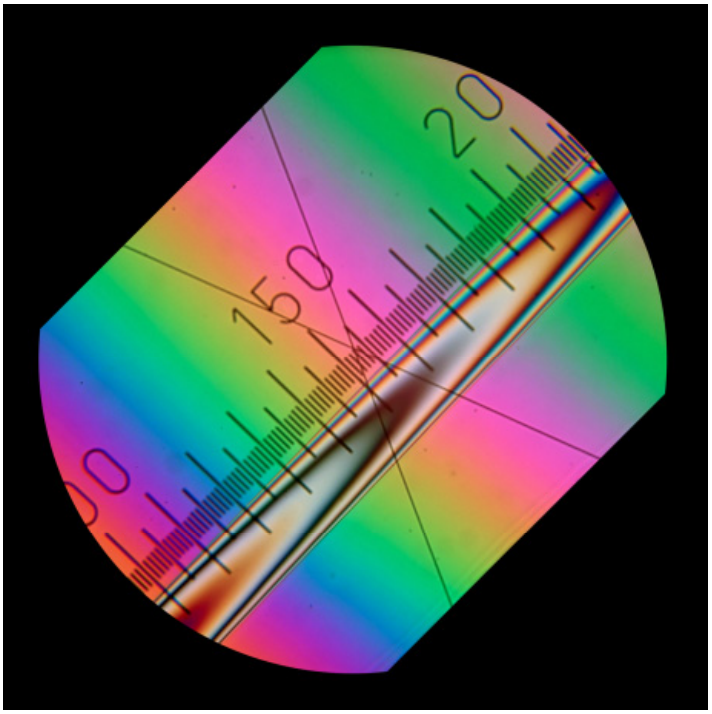
These adapters are useful for use with older microscopes, which have a photo tube of 25mm outer diameter. With an eyepiece of 6 times magnification a field number of about 11mm is captured. With higher power eyepieces the field gets to be unacceptably small. Because low power eyepieces are a rarity with contemporary microscopes, the use of these adapters again is limited to older style instruments. You may want to check with Diagnostics (www.diaginc.com) who offers system adapters for many current microscopes.

terrific potential. At six mega pixels the chip is not a resolution-limiting factor in micrography and the large pixels (compared to the point and shoot variety of digital cameras) favor a superior dynamic range. At exposure times of up to 30 seconds at 100 ASA equivalent the sensitivity is sufficient even for most fluorescence images.

I would not easily part with my DSLR and to "tame" it for use with the microscope was well worth the effort.

Copyright
Jan Hinsch
Retired from Leica Microsystems

Fuji S2 Pro, Chip 15.5 x 23, FN as a Function of				
Eyepiece Magnification and f Camera Lens				
	f 28mm	f 35mm	f 50mm	f 80mm
6.3x	39.3	31.4	22.0	13.8
8x	31.0	24.8	17.3	10.8
10x	24.8	19.8	13.9	8.7
Table				
micrographs with cut off corners. Field numbers in the table that				
are larger than the short side of the chip (15.5mm) will				
produce a circular image.				



The Wright eyepiece with Johannsen quartz double wedge reveals the magnitude of the retardation (1500nm) and the positive sign of elongation (hyperbola shaped extinction band) of this Nylon fiber in one spectacular view (lower left of page). The use of a DSLR makes it possible to photograph and preserve the unique appearance of a circular field which is partially cut off at two diametrically opposed points by the frame of the wedge.

Microtome Glass Knives Employed for Micro-FTIR Preparation* - by Thomas J. Hopen**

Even though my name is listed above, I cannot take credit for this "Tricks of the Trade". Dennis Ward with the Material Analysis Unit of the FBI Laboratory put me on to this during a SEM workshop at Scanning 2000. This preparation technique works so well for preparing soft to semi-hard samples for micro-FTIR analysis that I felt I had to "spread the word". Especially for fibers, I get faster, better, and more consistent results as compared to other methods including the roller wheel technique. All you need are two discarded ultra-microtome glass knives (Figure 1). Circles have been drawn on one surface of each of the glass knives so the circles will overlap when the glass knives are placed together. Under a stereomicroscope, place a glass knife (circle surface down) under the field of view and then place your sample within the slightly out of focus circle. Place the second glass knife (circle surface up) over the sample (Figure 2). The fiber shown below measures 10 mm in diameter. Then press the glass knives together using soft-nosed pliers with nylon jaws work very well, or a plastic clamp as shown in Figure 3. Once pressure has been applied, separate the knives and examine both knives for the flattened sample that will adhere to one of the surfaces (Figure 4). The fiber is now 20 mm in width. The sample can be removed using a fine needle and placed on a KBr plate for analysis by micro-FTIR. For soft materials, just pressing the two glass plates (blades) together with your fingers is usually enough. Try it, you will like it. Also, if anyone needs any glass knives just let me know. Two pieces of window glass measuring approximately 1" square can be used if glass knifes are not available.

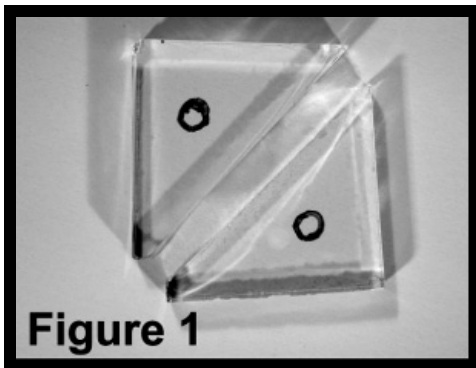


Figure 1

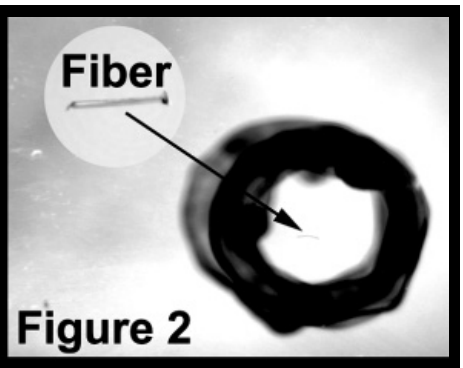


Figure 2

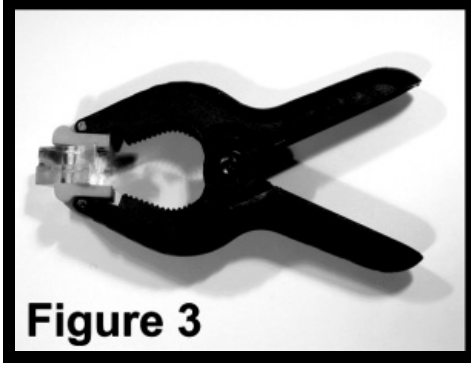


Figure 3

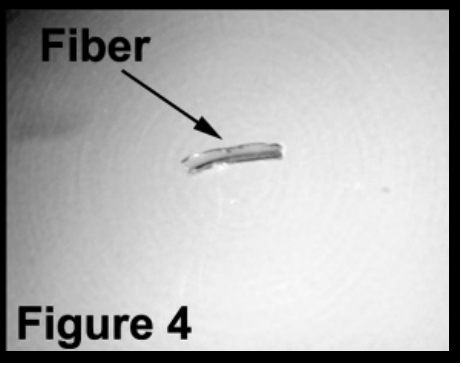


Figure 4

*This article originally appeared in Microscope (2002:50:4) but has been revised for this publication.

**Forensic Chemist, ATF Forensic Science Laboratory, 2600 Century Parkway, NE, Suite 410, Atlanta, GA 30345. E-mail – thomas.hopen@atf.gov

Technical Note for Paint Analysis Using a Illuminator IR by SensIR

Technical note:
Doing paint on an Illuminator IR by SensIR.

Paint cases can be challenging. Normally paint, no matter what application is composed of several layers, one on top of the other like a sandwich. The top layer and bottom layers are easy to do, but what about the layers in between?
Thom Hopen taught me a technique that works very well for instances such as that.

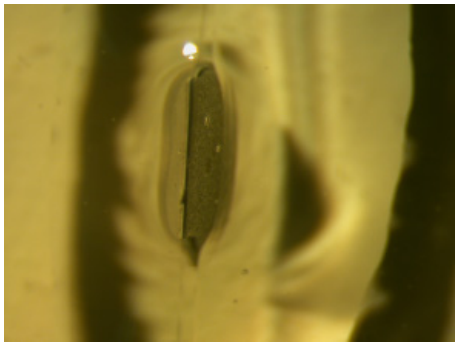
- A glass slide is cut in half and then mounted on another slide with Norland optical adhesive.
- A small chip of paint is placed on edge between two pieces of glass slide and small drop of Norland reagent is added and allowed to cure.
- The Norland reagent is cured by exposing it to UV light for approximately 15 minutes.
- After the Norland has cured, the slide is placed on a stereo microscope.
- While viewing the slide under magnification, a single edge razor blade is used to shave small sections of the chip that is embedded in the Norland reagent between the slides.
- The thickness of the slices can be controlled by the angle of the blade as it comes into contact with the Norland material.

Once the sections are cut, they can either be run directly on the Illuminator or a scalpel blade can be used to separate the individual layers so that they can each be ran alone.

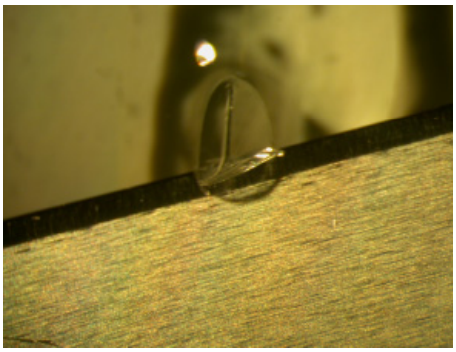
If you chose the former method it is done simply by placing the sample on the stage and touching the ATR objective to each individual section. This has the advantage of being completely nondestructive and the chip remains intact instead of being "disassembled" layer by layer.

James B. Crippin – Director
W.F.L.E.T.C.
Colorado State University Pueblo
Chemistry Department
2200 Bonforte Blvd
Pueblo, CO 81001

Vial of Norland reagent being placed on microscope slide.

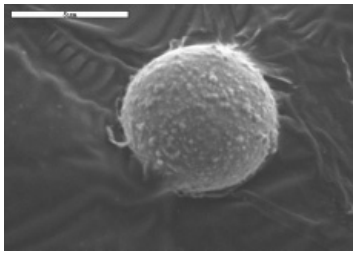


Paint chip embedded in Norland Reagent.



Razor blad slicing paint chip mounted on edge.

Western Forensic Law Enforcement Training Center at Colorado State University – Pueblo Chemistry Department, A New Concept in Forensic Analysis.



Lead, Barium and Antimony
IAMA Collection

The Western Forensic Law Enforcement Training Center is a facility dedicated to forensic analysis and law enforcement/forensic training. Currently there is nothing quite like it anywhere else in the United States.

Why is there a need for someplace like the training Center? Many laboratories and systems have cut their trace analysis units because of funding issues or have lost their trace analyst's for other reasons. Federal agencies are overwhelmed and are falling behind in getting casework done as well as providing training. The Center can fulfill this need in both areas.

How it all started. WFLETC started out as a thought over five years ago. The original proposal was written in 1999 and sat around for a few years gathering dust. A study that was done by DOJ/NIJ showed that there were few if any personnel outside of Federal labs that were qualified to do explosives analysis. Those that were capable of doing so were approaching retirement age and many states were dropping their programs because of lack of trained personnel. Additionally there were very few if any classes being offered in this and other related areas. I was asked to be part of a focus group that was set-up to address these particular issues. That was when I came up the original proposal and started to dream about setting up a training center.

After 9/11 it became more than just a dream. I started actively pursuing the training center concept and began to send the proposal to various people to look at the concept. I sent to all of our elected officials in DC and got very favorable responses from them at that time, but alas no money to do it. In 2001, USC (now CSU) and I started talking about the idea of a forensic science being offered in Pueblo. Out of that came the idea of possible basing the training center at the college. Low and behold, Senator Ben Nighthorse Campbell went to bat for us and acquired $248,375 to set-up the center on campus here in Pueblo. We have just recently been notified that we were awarded $994,000 to procure equipment and training.

Although we will be based in Pueblo, we will do case work from anywhere in the State of Colorado free of charge. We will also do criminal casework, on a fee for service basis, for any other law enforcement agency regardless of where they are located. This includes outside the United States. We already have been contacted by several other out-of-state laboratories, state systems and foreign countries about doing casework for them.

Upcoming classes?? We are currently scheduling some one day classes to be held on campus over the summer to address what we feel are some of the more current issues facing law enforcement today. There are classes that cover responding WMD, explosives/explosive device recognition, introduction to blood-spatter evidence to name a few. Also this summer we plan on offering some laboratory classes in arson analysis, explosive analysis and chemical weapons identification.

If you have any question please feel free to contact us.

James B. Crippin – Director
Western Forensic Law Enforcement Training Center
Colorado State University – Pueblo; Chemistry Department
2200 Bonforte Blvd
Pueblo, CO 81001

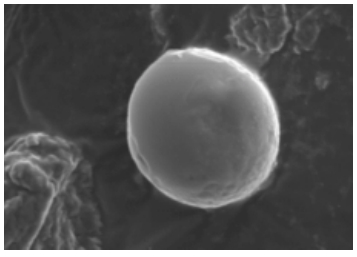
Office phone – (719) 549-2568 Lab phone – 2194 Fax – 2580 Pager (719) 546-8841

"You say tomato... I say cause of death."
-- Dr David Robbins

"Only clue he's got is a missing boat, which sucks because...it's missing."
-- Warrick Brown

CSI Quotes

http://home.iprimus.com.au/emery_s/csi-fan/quotes.html



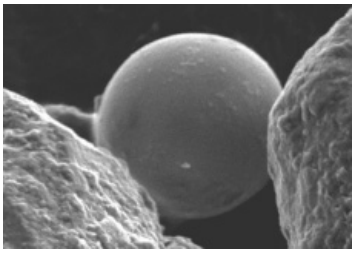
Lead, Barium and Antimony
IAMA Collection

Yahoo User Groups

"Forensic _SEM" Yahoo User Group:

On November 1, 2001 Dennis Ward of the Federal Bureau of Investigations (FBI) created a Yahoo User group to allow experts to discuss the forensic SEM detection and analysis of evidence. Since its inception, the Forensic_SEM user group has expanded to included 276 subscribed members around the world !
The Forensic_SEM user group has provided forensic scientist with extremely useful information from a host of experts in a timely manner. This is definitely a group to subscribe to if your wanting to add more resources to your arsenal. The only requirement to subscribe is simply being a working forensic scientist.

A round of applause is given to: Dennis Ward



Lead, Barium and Antimony
IAMA Collection

"LE_WMD Training" Yahoo User Group:

On September 19, 2003 James B. Crippin created the Weapons of Mass Destruction (WMD) user group. To date, the user group has expanded to include 115 subscribed members. The purpose of the user group is to provide a resource in the form of a central distribution area to disseminate information pertaining to WMD training schedules and applications to aide first responders in dealing with biological, chemical and radiological crime scenes. The focus of the user group has been directed to assist law enforcement, fire safety and professional personnel in providing the most updated trainings schedules and exchange of current information as it becomes available on a national and international basis.

A round of applause is given to: James Crippin

IAMA - 5 Year Anniversary 2004

IAMA will be 5 years old in 2004, well officially in October. Come and join in the festivities as IAMA celebrates all of 2004!

The year 2004 is going to be a special year for IAMA. We are in the process of gathering papers for a special anniversary edition of the IAMA newsletter and add additional features to the IAMA website. If any of our readers are interested in contributing to this historic event, please contact:

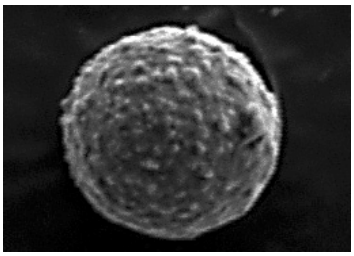
Michael V. Martinez
webmaster@iamaweb.com
(210) 335-4117 office
(210) 335-4101 fax

Wherever he steps, whatever he touches, whatever he leaves even unconsciously, will serve as silent witness against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool marks he leaves, the paint he scratches, the blood or semen he leaves or collects-all of these things and more bear mute witness
against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It cannot perjure itself. It cannot be wholly absent. Only its interpretation can err. Only human failure to find it, study and understand it, can diminish its value.

Crime Investigation, second edition, Paul L. Kirk (deceased),edited by John I.Thornton (1974),p.2. (Quoted also in "Footwear Impression Evidence" by William J.Bodziak,at page 1)

From The Bench

"FROM THE BENCH" is a section of the newsletter intended to provoke conversation, address new concerns, express opinions and, hopefully, provide insight into the new and old. Therefore, the opinions of the contributors are not necessarily those of the editors or other contributors.



Lead, Barium and Antimony
IAMA Collection

.22 Rimfire Ammunition

Over the last few decades, rimfire .22 ammunition has presented a challenge to gunshot residue (GSR) experts due to the differences in primer compositions between brands. Some manufacturers have changed their .22 primer compositions during the last two decades. Remington Arms Company in 1989 went from Pb (headstamp "U" (1958-1983) and "Rem" (1983 – 1989)) as the only heavy metal in their .22 primer material to PbSbBa (headstamp "Rem" only). Federal Cartridge Company went from PbSbBa to PbBa in early 1990 along with a change in all their cartridge box designs. This information was verified by recent conversations with representatives from both of these companies. Currently, it appears that U.S. manufacturers and many foreign manufactures of .22 ammunition use PbBa in their primers. Remington remains the exception for US manufacturers in that it has stayed with a primer composition of PbSbBa.

Bryan Burnett
Meixa Tech
1624 Debann Road. Building B
Cardiff, CA 92007
bryan@meixatech.com

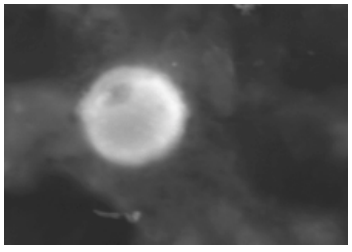
Science does not know its debt to imagination.

Ralph Waldo Emerson

"MR. DURST, THIS COURT FINDS YOU 'NOT GUILTY' BY REASON OF INSANITY...OF THE JURY."

In the end, accused millionaire murderer Robert Durst was done in by a chicken salad sandwich on pumpernickel. On October 9, 2001, with more than $500 in his pocket, he decided to steal a sandwich, a newspaper and a Band-Aid from a supermarket in Hanover Township, Pennsylvania. He was caught by security guards who called the police. A routine background check on Durst revealed that the odd-looking 58-year-old shoplifter was wanted for a mutilation murder in Texas, was a prime suspect in another murder in Los Angeles, and was also wanted for questioning in the 1982 disappearance of his first wife in New York.

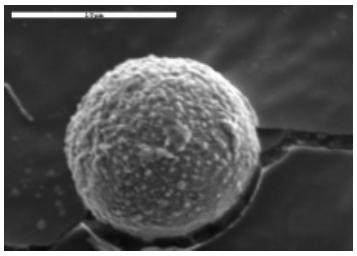
On November 12, 2003, a Galveston jury believed the argument proposed by the high priced attorneys employed by Robert Durst. The introduced argument of self defense had a greater precedence over the confessed mutilation and disposal of Mr. Black's dismembered body in Galveston Bay. To the surprise of the nation, the jury returned a not guilty verdict in the killing of Morris Black's dismembering body. Even Durst was stunned by the verdict.



Lead, Barium and Antimony Embedded in Carbon Tape
IAMA Collection

FYI! - *A reminder of upcoming events:*

Plan to Attend SCANNING 2004!



Lead, Barium and Antimony
IAMA Collection

This meeting is shaping up to be the best ever. Already we are anticipating:

- ✓ The Forensic Session, with 2 full program days
- ✓ GSR session - a discussion forum regarding those pesky GSR issues.
- ✓ A presentation from the folks at NIST answering critical EDS questions you didn't even know you should be asking!
- ✓ Short course: "Applications of SEM in Forensic Science"
- ✓ Exceptional attendance. Meet your peers.

The meeting will be held April 27 - 29, at the historic Hotel Washington, in the heart of Washington DC. Many superb tourist attractions are within walking distance (even the meeting registration will take place at the prestigious National Press Club!)

In addition to attending, please consider making a presentation in the technical session. These are casual, short presentations, and can be from a variety of topics, such as interesting cases, research, technical notes, applications, QA issues, etc. For more information, travel arrangements, reservations, etc, visit the Fams site at www.scanning.org Or contact Frank Platek (Forensic session chair) at fplatek@ora.fda.gov or me below.

Congratulations on your great choice for a New Year's Resolution.
See you there!

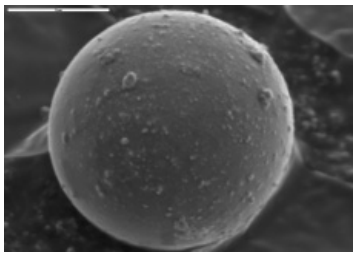
Dennis C. Ward

From now on we live in a world where man has walked on the Moon. It's not a miracle; we just decided to go.

Tom Hanks

Southern Association of Forensic Scientists
Fall 2004 Joint Meeting

with
Mid-Western Association of Forensic Scientists
Mid-Atlantic Association of Forensic Scientists
Canadian Society of Forensic Science
Grosvenor Resort
Walt Disney World – Orlando, Florida
September 20-23, 2004



Lead, Barium and Antimony
IAMA Collection