

# I.A.M.A. *International Association for MicroAnalysis*

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A NEWSLETTER FOR  
FORENSIC EXPERTS IN  
MICROANALYSIS

## The International Association for Microanalysis (IAMA) is on the World Wide Web!

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The International Association for Microanalysis (IAMA) has a new home, the worldwide web. On June 8<sup>th</sup>, 2002, the domain name ([www.iamaweb.com](http://www.iamaweb.com)) was registered with InterNic, and on June 13<sup>th</sup>, 2002, the official IAMA web site was unveiled.

The most significant change to IAMA is its evolution from the original focus of providing its subscribers with free newsletter publications regarding primer gunshot residue (P-GSR) to addressing all aspects of forensic microscopy.

IAMA has grown significantly since its creation in the Spring of 1999. From this growth, IAMA has expanded its objective from a subscriber base to establishing registered IAMA members. In addition, IAMA has applied for 501 (c) 3 United States not-for-profit tax status, which will allow IAMA to continue to further its mission and goals on a national level while continuing its international focus.

As the founder of IAMA, I have dedicated a great deal of personal time and energy in creating the newsletters, articles of incorporation, and website to further a cause that I am strongly

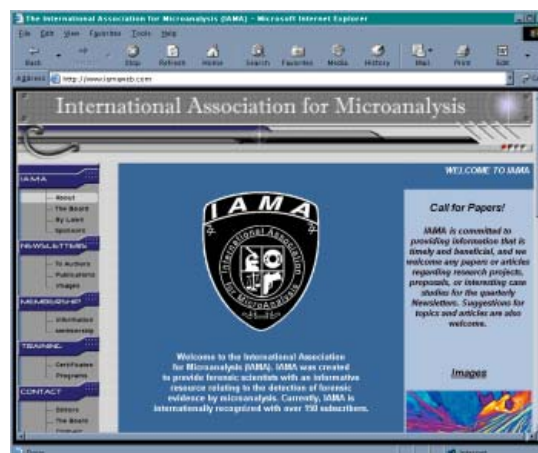
committed to. My ultimate goal has been to create an organization that can stand on its own merits and that emphasizes an area of forensic science that I believe has been unappreciated, underutilized, and understated in the judicial system. Although, IAMA is in its infancy as an established association, it is my hope that IAMA can continue to grow and expand to further provide forensic microscopists with valuable information pertaining to forensic microscopy.

To this end, I strongly encourage all those in the field of forensic microscopy to support the goals of this organization by continuing to contribute to the IAMA newsletter publications and by registering for membership so that we can expand our message with a future goal of a truly international conference for forensic microanalysts. This organization will only succeed with the support of its members.

Michael V. Martinez  
IAMA Founder  
Bexar Co. Criminal Investigation Laboratory

### Special Points of Interest:

- IAMA Website  
[www.iamaweb.com](http://www.iamaweb.com)
- IAMA Newly Created Microscopy Focus
- Call For IAMA Papers!
- Upcoming Meetings



## Identification of Pyrotechnic Reaction Residue Particles

### Introduction

Pyrotechnic reaction residues (PRR) are produced during the course of any pyrotechnic reaction, whether from fireworks or a pipe bomb. In some instances, traditional analytical chemistry can give confusing or erroneous results, especially when the item being sampled has been exposed to many different chemical sources. The same high degree of specificity that SEM / EDS offers in GSR detection, also applies to the identification of PRR particles; however, there are two important differences. First, the chemical elements present in PRR particles are mostly different and more varied than those usually found in GSR. Second, generally the quantity of PRR particles produced is at least a thousand times greater than that for GSR. Both of these differences translate into slightly different methodologies for PRR particle analysis than for GSR analysis.

Relatively little information regarding PRR particle analysis has appeared in the literature. Most of the articles are recent and in the context of pyrotechnic residues that may be found to meet the criteria of GSR. The two exceptions known to the authors are an article produced at the Forensic Explosive Laboratory in the UK,<sup>[1]</sup> and one by the authors of this article.<sup>[2]</sup> This lack of published information is unfortunate, because this can be a powerful investigative tool, and on those occasions when needed, probably no other methodology can produce comparably useful results.

### Pyrotechnic Reaction Residue Particle Morphology

In essentially every case, pyrotechnic reactions release sufficient thermal energy to produce molten reaction products. Further, in the vast majority of cases, some temporarily vaporized reaction products are also generated—usually along with some permanent gases. Assuming the py-

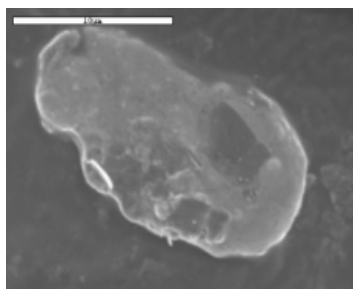
rotechnic reaction is somewhat vigorous, the temporary and permanent gases act to disperse the molten and condensing reaction products as relatively small particles. The size of these residue particles varies from several hundred microns down to considerably less than one micron, depending on the nature of the pyrotechnic composition and the conditions under which they were produced. Because of surface tension, those pyrotechnic reaction residue (PRR) particles that were molten and then solidified while airborne will be spherical (or at least spheroidal) in shape. The collection of electron micrographs in *Figure 1* demonstrates the appearance of some PRR particles. The selected particles range from approximately 10 to 20 microns in diameter. These particles were collected from a surface that was one foot (0.3 m) from an explosion produced using one type of fireworks flash powder.

### EDS X-ray Signatures

Of course, all of the chemical elements present in the unreacted pyrotechnic composition will be present in the reaction products. However, not all of the elements will be present in the solid residues to the same degree that they were in the unreacted composition. For example, any permanent gases produced will be lost. *Table 1* is a listing of elements commonly found in pyrotechnic compositions, along with an indication of their frequency of use in military and/or civilian items.

In *Figure 2*, the three upper X-ray spectra are those from individual particles in an unreacted flash powder with the formulation: 60% potassium perchlorate, 30% magnesium-aluminum alloy 50:50 (magnalium), and 10% sulfur. Below them is the spectrum from a *gross* sample of the unreacted flash powder, taken such that the X-rays originate from a large collection of individual particles and produce

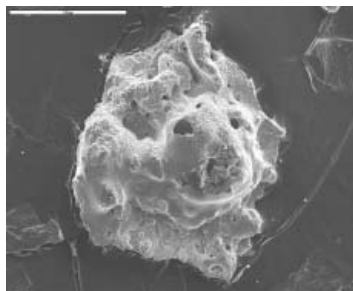
(Continued on page 4)



Lead and Barium  
IAMA Collection

**It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.**

***Sherlock Holmes  
A Scandal in Bohemia  
Sir Arthur Conan Doyle  
(1859-1930)***

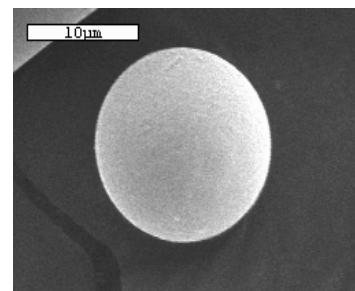
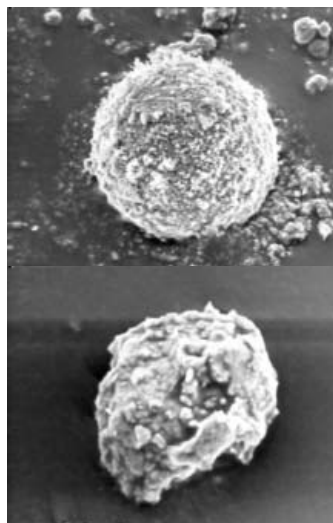
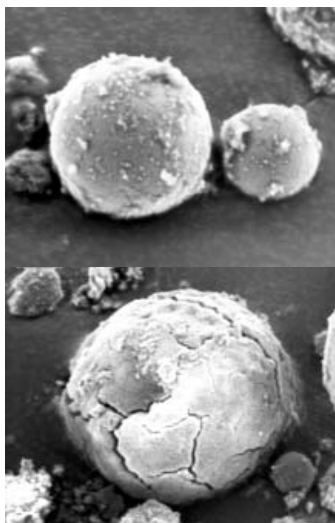


Lead, Barium and Antimony  
IAMA Collection

## Identification of Pyrotechnic Reaction Residue Particles....*Continued*

**Figure 1:**

Examples of 10 to 20 micron spheroidal pyrotechnic reaction residue (PRR) particles.



Lead, Barium and Antimony  
IAMA Collection

**Table 1:**

Chemical Elements Most Commonly Present in Pyrotechnic Compositions.

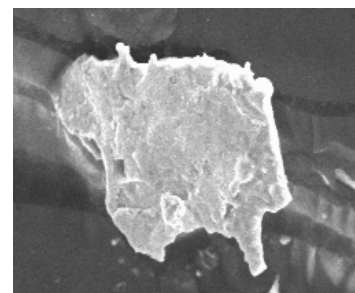
Element <sup>(a)</sup>	F/P <sup>(b)</sup>	Element <sup>(a)</sup>	F/P <sup>(b)</sup>
Sodium	1	Manganese	3
Magnesium	1	Iron	2
Aluminum	1	Copper	1
Silicon	2	Zinc	3
Phosphorous	3	Strontium	1
Sulfur	1	Zirconium	2
Chlorine	1	Antimony	2
Potassium	1	Barium	1
Calcium	3	Lead	2
Titanium	2	Bismuth	3
Chromium	3		

a) Only those elements producing characteristic X-rays with energies above 1.0 keV are listed. The elements are listed in order of increasing atomic number.

b) F/P means the “frequency of presence” of this element in pyrotechnic compositions. Rankings are based on the authors’ experience and a large collection of pyrotechnic reference texts. The rankings range from 1 to 3; with 1 indicating those elements most frequently present, and 3 indicating those elements only occasionally present. No attempt was made to differentiate between their presence in civilian versus military pyrotechnics.

**Science increases our  
power in proportion  
as it lowers our pride.**

***Claude Bernard  
(1813-78) French  
physiologist.***

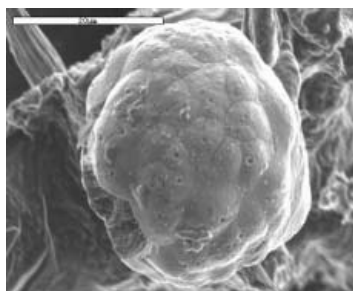


Lead, Barium and Antimony  
IAMA Collection

## Identification of Pyrotechnic Reaction Residue Particles....*Continued*

**Figure 2:**

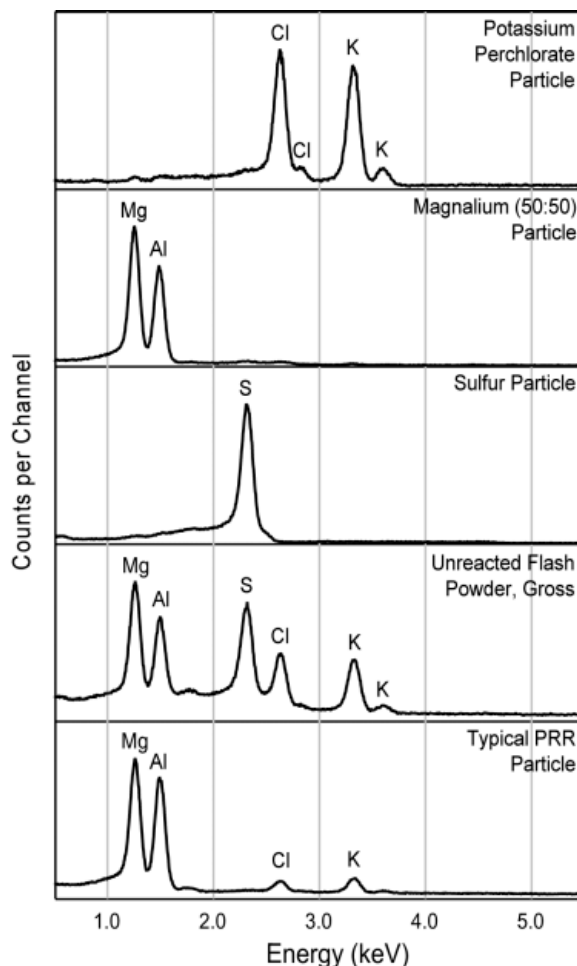
Reference X-ray spectra from a pyrotechnic flash powder.



Lead, Barium and Antimony  
IAMA Collection

**In such investigations, the mind is placed between two antagonist universal powers: a generalization or synthesis, the extreme of which destroys all individuality; and an individualization or analysis, whose extreme equally annihilates all generality: and consequently science cannot exist where either power is in excess, but arises from their mutual equipoise, being the middle term, the harmonizing principal, and performing the same useful office in what are termed the higher mental operations, that common sense discharges in ordinary life.**

**Lardner Vanuxem, early New York State Geologist.  
(Lardner Vanuxem, 1842, *Geology of New York, Part II, page 170*)**



(Continued from page 2)

a spectrum somewhat representative of the average composition of the flash powder. The lower most X-ray spectrum is typical of a PRR particle produced during an explosion using this same fireworks flash powder. In the lower two spectra, note the difference in the sulfur peaks; while it is quite prominent in the unreacted gross spectrum, it is missing from the residue spectrum. Presumably, this is because it has reacted to form sulfur dioxide, a gas, which is lost. The reduction of the potassium and chlorine peaks, and a small change in the ratio of magnesium and aluminum peaks is more complicated and is discussed in a subsequent article

addressing some of the finer points of PRR particle analysis.<sup>[3]</sup>

### A Case Study

The X-ray spectra in Figure 3 were produced as part of an accident investigation. In this case, an individual received burns when a firework reportedly exploded and sent burning pieces of pyrotechnic composition in his direction. Uppermost is the gross spectrum of one of the unreacted compositions taken from the firework alleged to have been responsible for the injury. Immediately below that is a spectrum typical of a PRR particle produced by burning this same pyrotechnic compo-

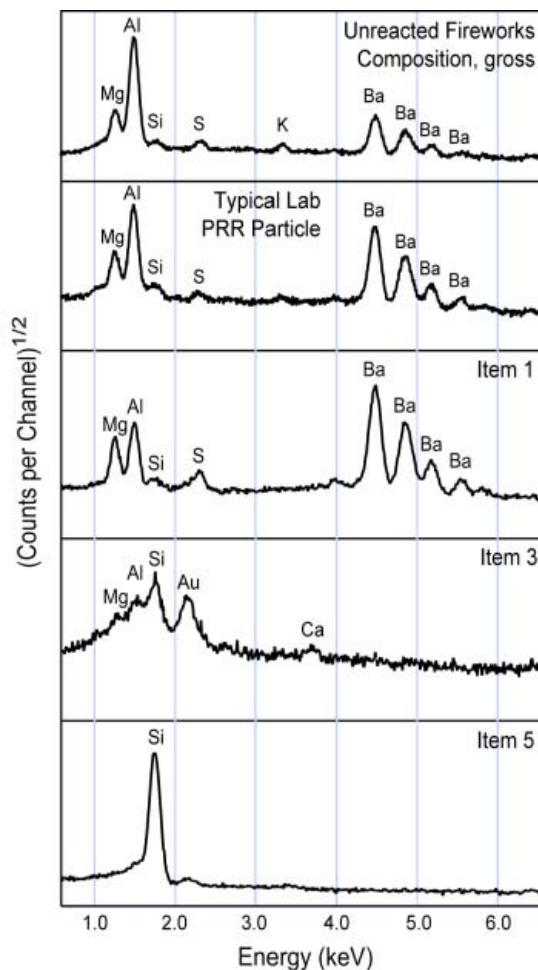
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## Identification of Pyrotechnic Reaction Residue Particles....*Continued*

**Figure 3:**

X-ray spectra produced during an accident investigation.



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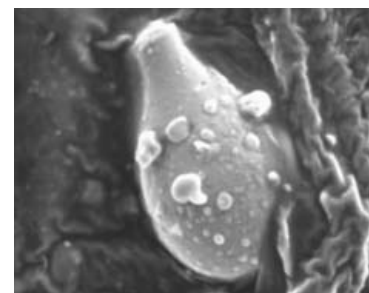
sition under laboratory conditions. Figure 4 is an electron micrograph of a small portion of a sample taken from inside the individual's clothing, from the general area where the burn occurred. In this image, a series of six items are identified for use as examples of the way the analysis was performed. (In the actual investigation, several additional particles seen in this image were also analyzed, as well as many other particles from other portions of this and other samples.)

Particles one and two in Figure 4, have the correct morphology for PRR particles and produce reasonably high count rates above 0.6 keV. Further, their elemental

composition is consistent with that of a PRR particle produced by this pyrotechnic composition. (See Figure 3 for one of the spectra.) Also, many more particles with the same elemental signature were found in the same area of clothing where the injury occurred. Finally, no similar particles were found on background areas of clothing remote from the area of the injury. Accordingly, with a high degree of confidence, particles one and two are identified as PRR particles.

Particle three has the obvious appearance of a fiber; most likely from the individual's clothing itself. Further, its counting dead time and peak-to-background ratios

(Continued on page 6)



Lead, Barium and Antimony  
IAMA Collection

**By a man's finger-nails,  
by his coat-sleeve, by  
his boots, by his  
trouser-knees, by the  
callosities of his  
forefinger and thumb,  
by his expression, by  
his shirt-cuff - By each  
of these things a man's  
calling is plainly  
revealed. That all united  
should fail to enlighten  
the competent inquirer  
in any case is almost  
inconceivable.**

**Sherlock Holmes  
A Scandal in Bohemia  
Sir Arthur Conan Doyle  
(1859-1930)**

## Identification of Pyrotechnic Reaction Residue Particles....*Continued*

(Continued from page 5)

are quite low, suggesting it consists mostly of low atomic number (Z) atoms, and its elemental composition is essentially devoid of those major elements associated with geologic or pyrotechnic materials. (See Figure 3.) Accordingly, with a high degree of confidence, this item is identified as being organic material. (The presence of an X-ray peak from gold is the result of the specimen having been sputter coated with gold for the purpose of facilitating the taking of a high resolution electron micrograph for this article. However, in most analyses, the samples are left uncoated.)

Particle four is roughly spheroidal, although it is elongated with a fairly pointed end. Accordingly, it has been conservatively designated as having a morphology that is indeterminate. Its counting dead time and peak-to-background ratios are quite low, suggesting it consists mostly of low Z atoms. Its elemental composition appeared to be much like that of item three. However, it has been conservatively designated as indeterminate because of a somewhat increased prominence of X-ray peaks most consistent with geologic material (calcium, silicon, magnesium and aluminum). Taking everything into consid-

eration, with a reasonable degree of confidence, this particle could have been identified as being organic in nature; however, it was more conservatively designated as being *Non-PRR*.

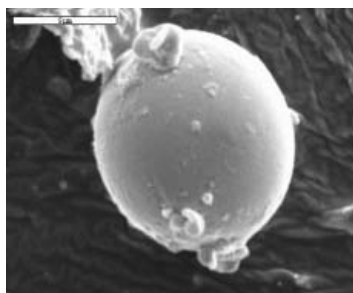
Particle five is of non-spheroidal morphology, has a relatively high dead time, has a very high peak-to-background ratio, exhibits elemental composition consistent with being silica sand, and quite inconsistent with being pyrotechnic. (See Figure 3.) Further, samples taken from an area of the clothing—well beyond the area of likely deposition of PRR particles—contain many particles of the same elemental composition. Accordingly, with a high degree of confidence, this particle is identified as being of geologic origin. Except for its spheroidal shape, particle six is like that of particle five. However, geologic particles that have been mobile in the environment for a prolonged time tend to become near spherical in shape. Accordingly, with a high degree of confidence, this particle was also identified as being of geologic origin.

In this case, after considering all of the SEM / EDS data generated, the results are fully consistent with the individual being injured by a firework like the one alleged.

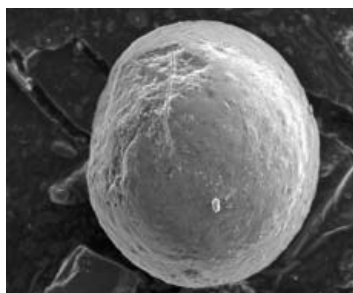
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**The most  
incomprehensible thing  
about our universe is  
that it can be  
comprehended.**

***Albert Einstein (1879-1955) U. S. physicist,  
born in Germany.***



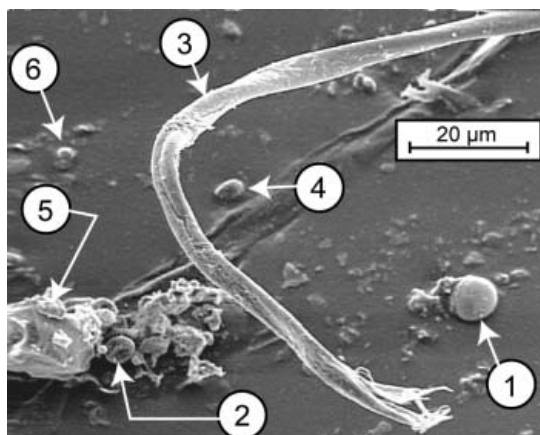
Lead, Barium and Antimony  
IAMA Collection



Lead, Barium and Antimony  
IAMA Collection

**Figure 4:**

An electron micrograph identifying a series of particles (items) collected from an accident victim's clothing.



## Identification of Pyrotechnic Reaction Residue Particles....*Continued*

(Continued from page 6)

### Conclusion

The use of the SEM / EDS methodology to analyze PRR particles in the course of investigating crimes and accidents involving pyrotechnic materials can provide information with a degree of sensitiveness and specificity that is not available with other commonly used chemical analyses. Given the wide spread availability of SEM / EDS instruments and the long history of the successful use of the same methodology in GSR analysis, it is somewhat surprising that the technique is not used more often in investigating crimes and accidents involving pyrotechnics.

### References

- 1) S. A. Phillips, "Analysis of Pyrotechnic Residues—Detection and Analysis of Characteristic Particles by SEM / EDS", *Proceedings of the 2<sup>nd</sup> European Academy of Forensic Sci-*

*ence Meeting, Sept. 2000.*

- 2) K.L. & B.J. Kosanke and R. C. Dujay, "Pyrotechnic Reaction Residue Particle Identification by SEM / EDS", *Journal of Pyrotechnics*, Issue 13, 2001.
- 3) K. L. & B. J. Kosanke and R. C. Dujay, "Analysis of Pyrotechnic Reaction Residue Particles Using SEM / EDS", submitted to the *Journal of Forensic Science*.

K. L. Kosanke  
PyroLabs, Inc.  
and  
Richard C. Dujay  
Mesa State College  
Electron Microscopy Facility

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## IAMA Focus and Membership Form On-Line

IAMA has recently expanded its focus from providing its subscribers with free newsletter publications regarding primer gunshot residue (P-GSR) to addressing all aspects of forensic microscopy in its newsletters to registered IAMA members. In order to create a membership registry, existing subscribers who wish to continue receiving the IAMA newsletter must complete a membership application. For prospective new IAMA members, an amnesty period will be granted regarding the required two (2) references from existing IAMA members form. Until further notice, the substitution of two (2) references from

any established forensic organizations will satisfy this requirement. The IAMA registration application forms can be downloaded by visiting the IAMA link:

<http://www.iamaweb.com/membership/membership.html>

Thank you for your support.

Michael V. Martinez  
IAMA Founder  
Bexar Co. Criminal Investigation Laboratory

### Microscopy Resources

Jeol

<http://www.jeol.com/downloads.html>

The Electron Microscopy Outreach Program

<http://em-outreach.sdsc.edu/web-course/toccontents.html>

Molecular Expressions  
Microscopy Primer  
Specialized Techniques  
<http://micro.magnet.fsu.edu/primer/techniques/darkfieldindex.html>

Microscopy and Imaging Faculty

<http://research.amnh.org/idl/index.html>

Reflected Light Microscopy  
<http://www.mines.utah.edu/~wmep/59298/592/rlm.html>

Microscopy Resource Center  
<http://www.olympusmicro.com/primer/techniques/darkfieldindex.html>

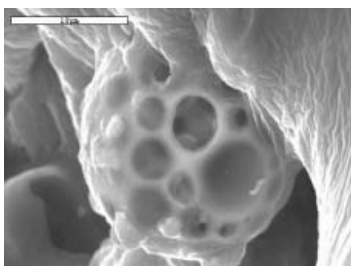
History of Light Microscopy  
[http://www.utmem.edu/~thjones/hist/hist\\_mic.htm](http://www.utmem.edu/~thjones/hist/hist_mic.htm)

Electron Microscopy Arcade  
<http://www.unl.edu/CMRAcfem/em.htm>

Petr's Microscopy Resources  
<http://www.petr.isibrno.cz/microscopy/>

Microscopy Vendors Database  
<http://www.kaker.com/mvd/links.html>

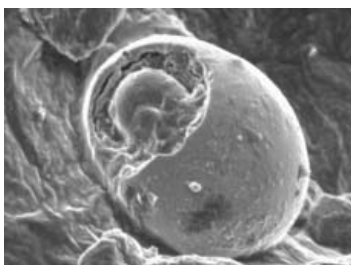
## Distinguishing Characteristics for the Determination of Forensic Microtrace Particle Origination



Lead and Barium  
IAMA Collection

**I should prefer that you do not mention my name at all in connection with the case, as I choose to be only associated with those crimes which present some difficulty in their solution.**

***Sherlock Holmes***  
***The Adventure of The Cardboard Box***  
***Sir Arthur Conan Doyle***  
***(1859-1930)***



Lead, Barium and Antimony  
IAMA Collection

Microtrace particle analysis is employed by forensic analysts using automated search routines with scanning electron microscope / energy dispersive spectroscopy (SEM/EDS) systems. Applications for such a technique stem from the underlying need to associate microscopic particulate material to a crime scene environment. Just as the late mentor Dr. Walter C. McCrone and his colleagues were able to accomplish with polarized light microscopy, the forensic electron microscopist can offer similar or complimentary information about evidence.

Typically the SEM/EDS samples are collected or prepared on carbon adhesive stubs. Scenarios which might warrant the use of SEM/EDS particle analysis are exemplified by cosmetic stains involving abductions and rape, road hazard flare (fusee) residue in arson ignitions, cutting torch residue during safe robberies, copper/chromium/arsenic (CCA) salt residue from pressure treated lumber thefts, and other unique situations that occur which involve environment-to-suspect particulate transfer. Of course the most common application of this technique in forensic science is for the location and identification of primer residue (GSR).

Over the past five years there has been a considerable amount of effort and concern among the forensic microtrace community to establish confidence in characterizing primer residue from a firearms discharge. The West Virginia State Police Forensic Laboratory has been conducting SEM/EDS particle analysis and classification of adhesive tape samples from persons and objects involved in shooting crimes for the past sixteen years. This has been accomplished by integrally interfacing a scanning electron microscope, an energy dispersive spectrometer, and an automated stage. Originally, and yet still to date, this hardware/software system consists of a CamScan series II (1985) SEM, a Tracor Northern 5500 (1985) EDS, the latest ver-

sion of particle analysis and classification software (~ 1989) developed by Robin Keeley and Peter Nolan of the London Metropolitan Police Laboratory, and a Fastrac automated stage controller. More recently a second SEM/EDS system has been acquired in an effort to help with the case backlog and keep up with technology. This new system consists of a Tescan Vega (2001) SEM, and the Oxford ISIS/INCA (2001) EDS. This system does an admirable job with automated GSR analysis. Accurate classifications and stage position recall, along with a stable beam and a maximum accelerating voltage of 30 kV are key features of this instrument.

Morphology should be considered to gain insight into the creational origin of a micrometer size particle. Particles with spheroidal shapes suggest that it has experienced a high temperature, melt/vaporization/condensation process. Though this hallmark appearance is reassuring, it has been demonstrated that non-spheroidal particles are also produced during a firearm discharge.

Accessing the total population of classified particles is essential in determining if the residue is attributed to a firearm. Giving consideration to the presence of 'support' and 'anti-support' particles helps to justify the particle's origin and creation. Morphologically correct lead, lead/copper, lead/antimony, and lead/antimony/copper are support particles for GSR. These are suggestive of lead, antimony, and/or copper materials that have vaporized and condensed. Though they are not exclusive to only projectile residue, they are a likely source for such. Other support particles include any two of the three component ingredients as well as barium/aluminum. Anti-support particles in the sample population include those that are products of pyrotechnic devices such as magnesium/aluminum/barium,

*(Continued on page 9)*



## Distinguishing Characteristics for the Determination of Forensic Microtrace Particle Origination....

### *Continued*

*(Continued from page 8)*

chlorine/potassium, sulfur/potassium, sulfur/chlorine/potassium, barium/potassium/chlorine, and barium/chlorine. Inordinate amounts of barium/sulfur and/or iron are other anti-support particles that are found in copious amounts from brake pad/shoe lining dust. Automated searches of known pyrotechnic or brake lining residue quickly reveals large amounts of anti-GSR support particles. It behooves the analyst to not only manually recall and identify three component particles but also representatives of the support particle population. Inter-particle consideration is a valuable asset in attempting to determine the origin of lead/barium/antimony particles.

Intra-particle elemental composition also needs to be inspected. Caution should be exercised if a particle has an appreciable amount of iron or sulfur. Any amounts of magnesium and other recognized 'prohibited' (Aerospace Report) elements disqualifies particle association with GSR. Significant amounts of unexplainable signals from chlorine or potassium may indicate pyrotechnic residue. An explainable chlorine and potassium signal may occur when the GSR particle is next to a skin cell, or sweat minerals. This can be verified by checking the EDS spectrum of adjacent areas.

Perhaps barium/antimony/lead particles having suspicious or prohibited elements are GSR from primer compositions, ammunition, or firearm components that have them. Herein lies the need to compare the residue produced by the involved ammunition and/or firearm when they are available as evidence and when the data warrants.

In summary, merely locating and identifying barium/antimony/lead particles may not be adequate to confidently conclude that they are of firearms' origin. The

morphology, inter-particle populations, intra particle elemental compositions, and verification of the known residue from the evidence can creditably result in its firearms discharge origination. Just like any opinion rendered in forensic science disciplines, the conclusions must be based on the analysts' education, experience, and the evidence. Evaluation of the origin of barium/antimony/lead particles is an intricate process which is not necessarily black and white. Attempts to pigeon hole decisions (ASTM Standard E ,1995 and future revisions) of the origin of these particles are not conducive and eliminates the meritable circumstantial considerations which are unique to each crime scenario.

This flexibility is ultimately substantiated by verifying the known residue involved in the incident. With .22 caliber primer residue the fired cartridge casing usually has to be checked to correlate the residue it produces. An example is the Remington .22 ammunition. Previous to about the middle 1980's this ammunition primarily consisted of lead only residue particles. A formulation change has occurred at some point and it is possible for .22 caliber Remington ammunition to create barium/antimony/lead particles. Federal .22 caliber ammunition formulations also seem to have changed from barium/antimony/lead to barium/lead. Either type of the Federal and Remington residue may be encountered as evidence. It has yet to be shown that barium/antimony/lead/tin particles occur in non-firearms sources. Therefore these can be considered very specific for GSR. Barium/antimony/aluminum particles, with trace or no lead, are becoming frequently encountered. This primer formulation is thought to reflect the replacement of lead styphnate with an organic shock sensitive material such as tetracene and the addition

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Lead, Barium and Antimony  
IAMA Collection

**Truth in science can be defined as the working hypothesis best suited to open the way to the next better one.**

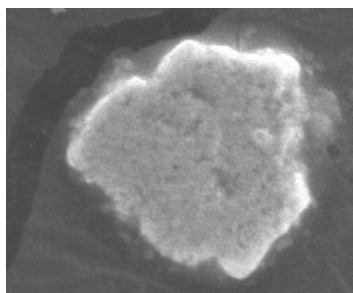
**Konrad (Zacharias) Lorenz (1903-89)  
Austrian ethologist.  
[Nobel prize for medicine, 1973]**



Lead and Barium  
IAMA Collection

## Distinguishing Characteristics for the Determination of Forensic Microtrace Particle Origination....

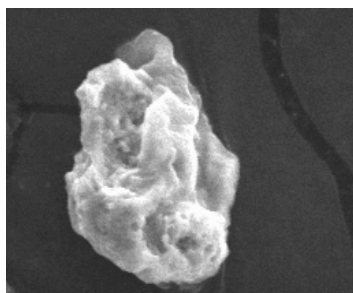
### *Continued*



Lead, Barium and Antimony  
IAMA Collection

**The most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science.**

***Albert Einstein (1879-1955) U. S. physicist, born in Germany.***



Lead, Barium and Antimony  
IAMA Collection

*(Continued from page 9)*

of aluminum for fuel. Some minor amounts of sulfur/lead are occasionally noted. These types of particles are strongly associated with GSR. Other examples of primer residue include mercuric, non-mercuric, corrosive, barium/calcium/silicon, and new generation 'heavy metal free' formulations. The astute forensic microtrace particle analyst should always be alert for novel changes in the primer/ammunition industry as well as be aware of obsolete formulations that still may be encountered.

Overall, comparison of the questioned particles with any available known residue ultimately enhances the forensic relevance of the examination results. Caution and thorough consideration has to be given to the preparation of known residue samples. Contamination is a major concern. Known residue samples are prepared from the fired cartridge casing in a different room than where the SEM is located. Gloves are worn and the sample vial lid should be opened, exposing the adhesive stub before the cartridge casing is handled. A wooden applicator is stirred around the interior of the casing and it is rolled over a carbon adhesive stub. A second stirring is done using the same applicator that now has a thin coating of adhesive on it from the stub. This is then

again rolled over the stub. Banging or tapping out the residue is avoided since this may overload the adhesive and permit unfastened particles to migrate to other samples in the SEM. Conscious efforts are made not to touch anything except the casing and applicator stick end. Once sampling is complete, the fired casing is sealed in a suitable container, gloves are removed, and the hands are washed. Then the sample vial is returned to the protective vial, after a gentle puff of air is exhaled over the stub to remove any excess particles. The vial is then labeled if this has not been done previously to the sampling. Actually discharging the firearm with the involved ammunition is another alternative. This residue will represent contributions from both the projectile and the firearm components. Inevitably, this event requires the proper location and stringent measures to address contamination concerns. Ideally, the trace analyst would not perform this collection.

Microtrace particle analysis via SEM/EDS is a valuable tool in forensic science. With care, education, experience, and insight conclusions can be drawn about particulate evidence as it relates to victims, suspects, and crime scenes.

J. R. GIACALONE, MSFS  
West Virginia State Police  
Forensic 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 submit to:

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

**FYI!**

*A reminder of upcoming events:*

The SWAFS 2002 committee has put together a training conference to meet a variety of backgrounds. In this time of tight budgets, we have tried to provide the most training for the least cost. Look over the workshop outlines, find what is right for you, and complete and return the registration forms. Don't forget to send in the abstract for that paper you've been putting off - now's a good time to present it. Join us on November 4th-7th at the:

**OLD TOWN HOTEL AND CONFERENCE CENTER**

7353 E. INDIAN SCHOOL ROAD

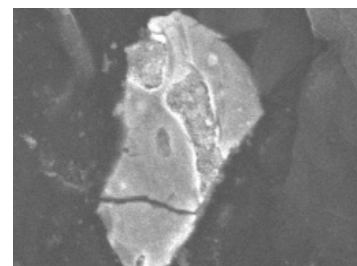
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Register at:

[www.swafs.org](http://www.swafs.org)



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**Forensic Papers, Posters and Short Course****SCANNING 2003 in San Diego**

**May 3-5, 2003**

Dear Fellow Forensic SEM members,

I wanted to extend a personal invitation to the group to submit abstracts for platform papers and/or posters for **SCANNING 2003**.

Since 1993, the **SCANNING** meeting has hosted the *Application of Scanning Microscopy in Forensic Science Session* among its numerous scanning microscopy sessions. Our session has grown from a single morning of contributed and invited papers to two full days of papers and a "Forensic Forum" group discussion. Topics which qualify for presentation are any application of scanning microscopy (SEM, confocal, etc.) in the field of forensic science including GSR analyses, particulate (non-GSR) analyses, unique applications and methods as well as interesting case applications of scanning microscopy.

In addition to the two days of papers, a one day short course "**Scanning Microscopy in Forensic Science**" covers a variety of topics including GRS analyses, product tampering, a sample preparation segment (collection, handling, embedding, polishing, micromanipulation, etc.), instrument calibration issues and more.

Plan to be with a lot of forensic friends you already know and meet some of the other folks you only know from the web site.

The issues will be topical and most interesting and socializing with the forensic group is a unique experience!

Information on the meeting, accommodations and abstract submission may be found on the **SCANNING** website at [www.SCANNING.org](http://www.SCANNING.org). E-mail address for correspondence is [scanning@fams.org](mailto:scanning@fams.org).

Questions about the forensic session or short course, call me and I'll be glad to help.

I'm looking forward to seeing many of you in San Diego!

**S. Frank Platek, MS**

**Forensic Program Chairman**

**SCANNING 2003**

**US FDA Forensic Chemistry Center**

**6751 Steger Drive**

**Cincinnati, Ohio 45237-3097**

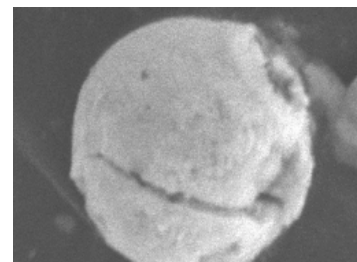
**(513) 679-2700 X254**

**(513) 679-2761**

**[fplatek@ora.fda.gov](mailto:fplatek@ora.fda.gov)**

**A man must have a certain amount of intelligent ignorance to get anywhere.**

**Charles Franklin Kettering (1876-1958)**  
**U. S. engineer and inventor.**



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A NEWSLETTER  
FOR FORENSIC  
EXPERTS IN  
MICROANALYSIS

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