Report on some scientific finding in the experiments run on Proton21 samples in different laboratories in Belgium.

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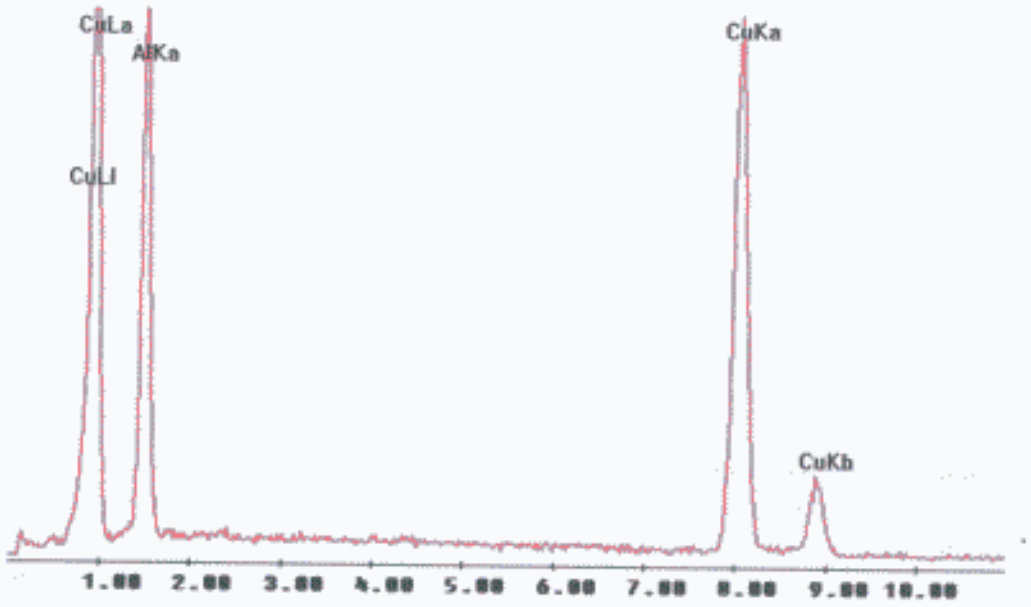
Label A: 238 general contamination



The experiment was operated in a blindfolded way. We do not know what each of the samples represent. In the title of each of the spectra the number of the samples is being given. The analysis on the samples can be made either on a big part of the surface or to a point that is typically still 1 to 5 microns. Depending on the technique used the X-rays come from deeper or more from the surface layer. With Backscattered Electrons the most interesting results are seen because the heavier elements appear whiter on the screen and can easily be detected. For focusing of the electron beam on the sample initially the normal secondary electrons are used since this allows better focusing of the beam on the sample. Subsequently with computer control it is easy to change to the backscattered mode for the reasons mentioned above.

Sample 238 : this is Aluminium on a Cu detection screen. Most probably Al target has been shot and a lot of the material of the Al has reflowed over the Cu surface. The morphology of the surface is interesting to observe in this case as it is a sample which contains "holes" in the reflowed Aluminium. We have observed that the heavier impurities reside essentially in these "holes". This leads us to the conclusion that it is interesting to do the experiment to peel off the aluminium from the Cu substrate. This is probably possible because the aluminium has created a film on the Cu substrate. Due to thermal effects cracks are observed. From the analysis of the visual microscopy it can be seen that the thermal effects and the cracks have been created after the "shot". On the

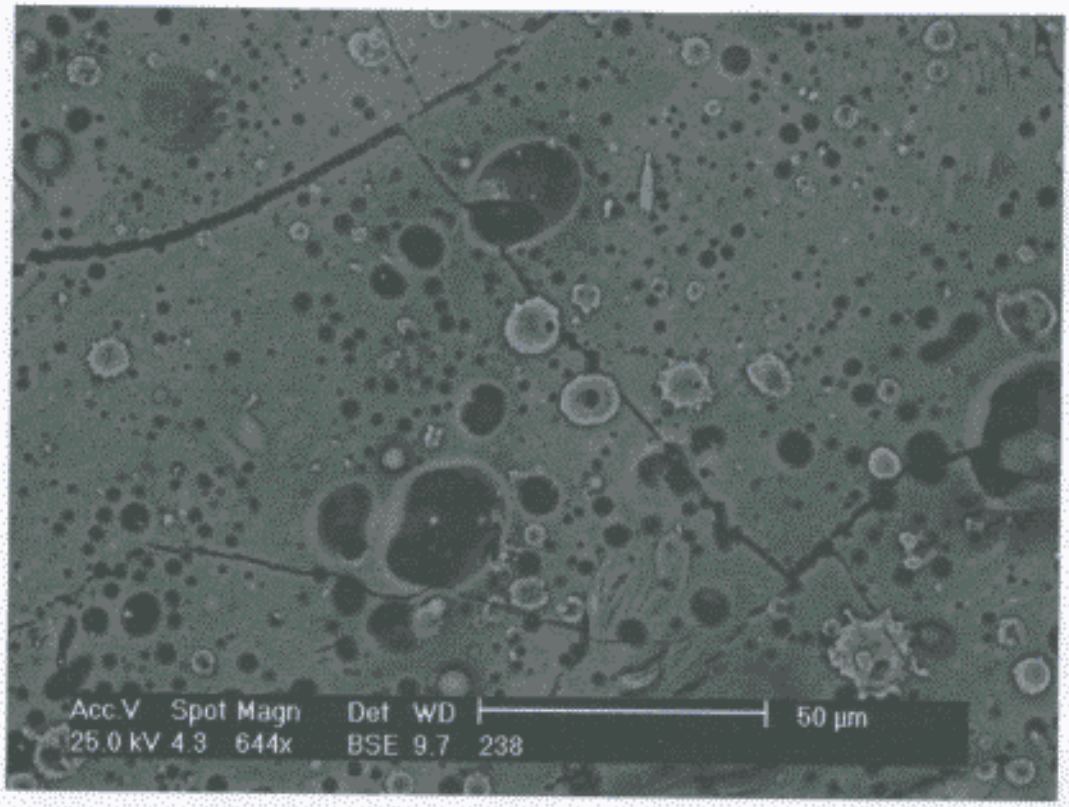
surface (and as said also in the holes in the Aluminium) smaller impurities can be found evenly over the whole surface. These impurities vary in size. For our measurements only the larger particles are interesting (at this stage) because they can be analysed in the detection limits of the equipment.

It is important to notice that the results obtained are identical on 3 different types of equipment used in 3 different laboratories and with 3 different operators.

It is important to notice that the experience of the operator plays an important role in the speed with which the results can be obtained. With similar machines different operators use different methods (sometimes slower, sometimes faster) but come to the same conclusions.

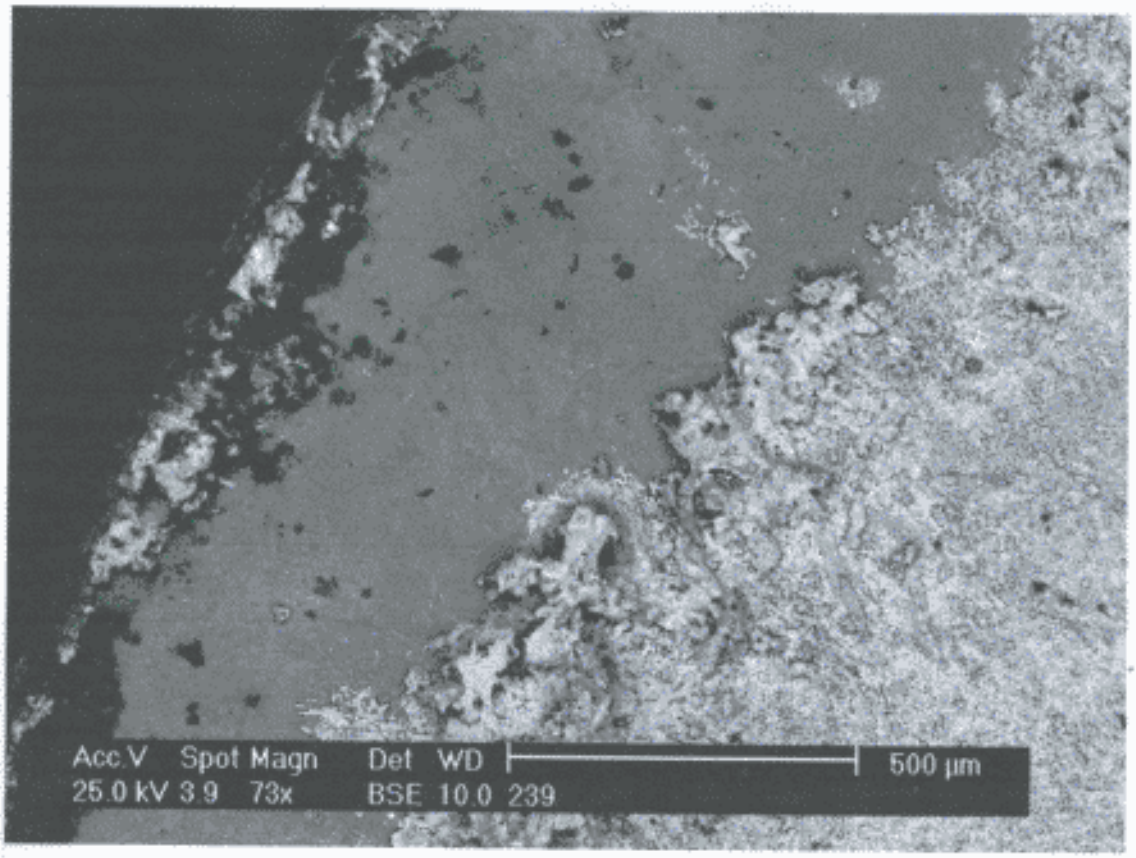
The interesting fact about the laboratory in Ghent is that they produce better statistics. Whereas the other operators were more "impatient" due to time pressure on the machine, the operator in Ghent allows for longer data gathering. This approach then also produced the more interesting results in smaller "unidentified" peaks. This means that the peaks are as such not yet identified, but that further analysis and longer statistical experimentation is necessary to produce statistically more relevant results.

The longer statistics reveal more detail in the spectra. The initial spectra taken were done with the instruction to find "contamination" on the Cu detection screen. Therefore the operator was already happy if he found "something" and didn't really bother to look into further detail.



The backscattered pictures of sample 238 show the cracks in the aluminium surface. You can clearly see the splashes on the surface which, by morphology are a proof that the splashes are created and deposited "after" the shot but yet the splashes show that the material was still in a liquid form at the moment that it fell on the surface.

On this sample not the Al as such is interesting. Rather the splashes. The splashes contain for the largest part also Aluminium, but in the smaller impurities the other elements can be found. As said, more detailed analysis of the spots in the holes of the Al are very interesting.



Sample 239 reveals a distribution of Pb on the Cu detection screen. Easy to detect of course. The morphology of the lead on the Cu detection screen is completely different than the one of Al on the same Cu detection screen. The distribution reminds of "solder" on the Cu. Experiments with Pb involved are more difficult because Pb is already a heavy element and therefore it is more difficult to detect even "heavier" elements with backscattering. The way the Pb is reflowed on the Cu substrate makes one assume that there are more impurities "under" the reflowed Pb than there are on top of the reflowed Pb.

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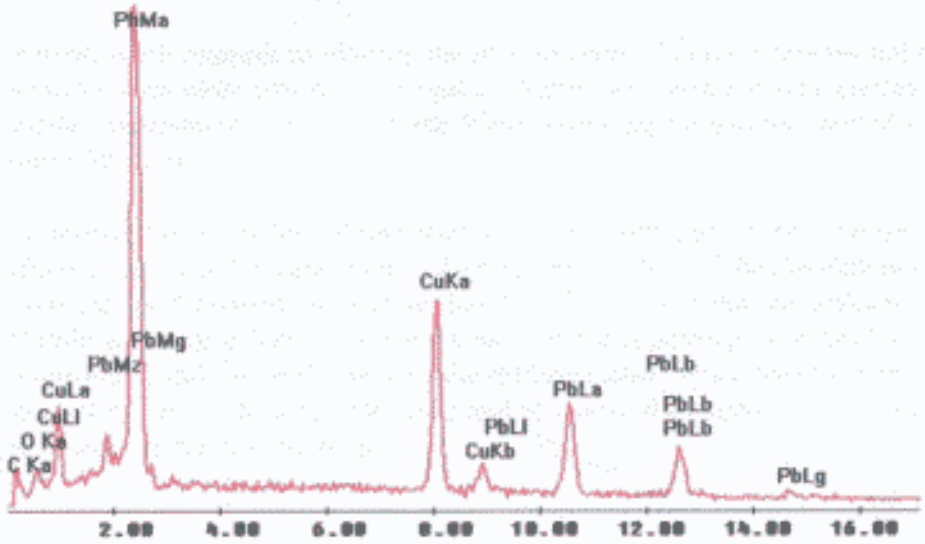
Label A: 239 black contamination



The overall analysis shows all the different peaks of Pb and Cu on the screen as well as some C and O… for which the operator did not really care or worry.

On the other hand, at a different spot the following spectrum was obtained.

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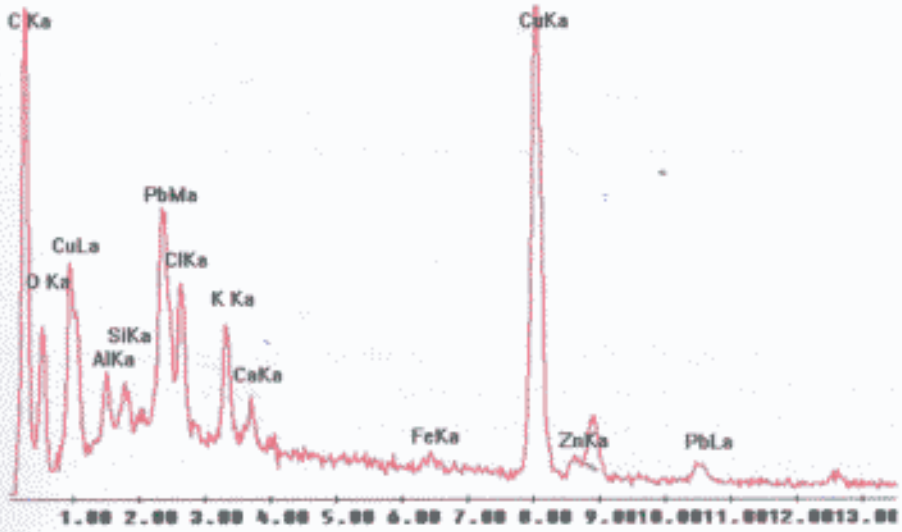
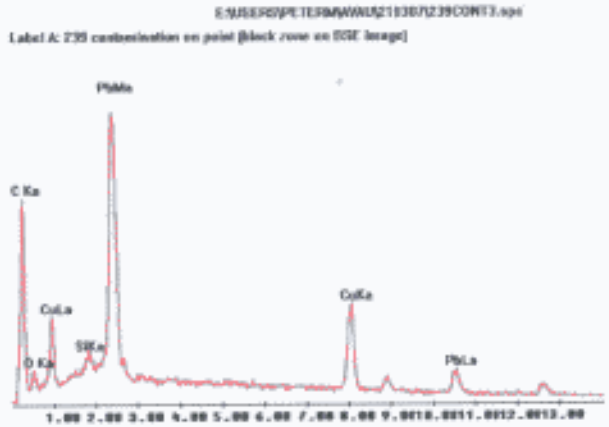
Label A: 239 contamination on edge (black zone on BSE image)



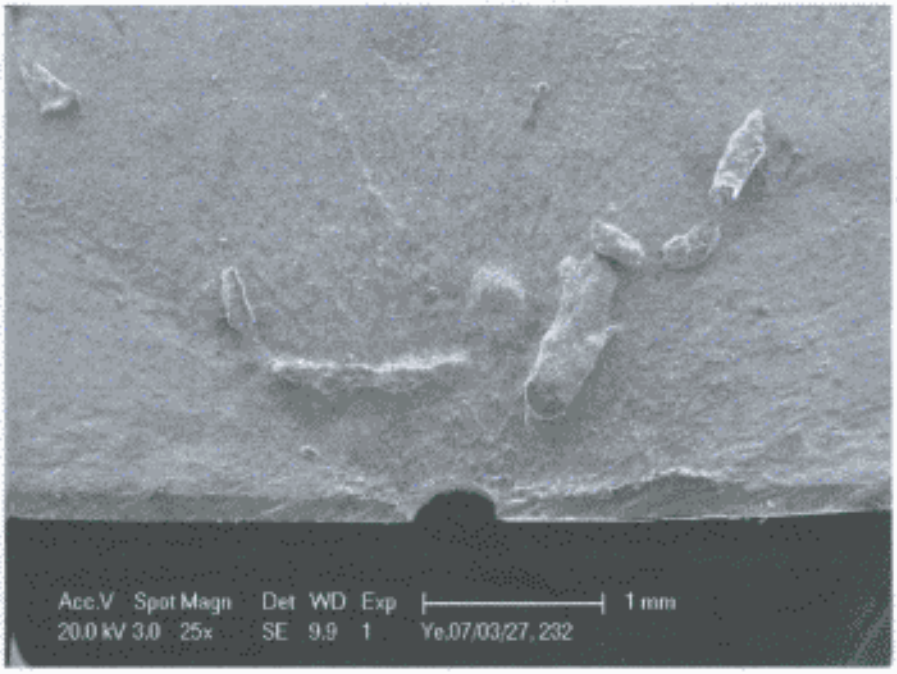
Without any doubt besides Cu and Pb (evident), there is undoubtedly the presence of C, O, Al, Si, K, Ca, Fe, Zn… Repeated verification with the operator proved the same conclusion. The elements are there in macroscopically quantities so that they cannot be attributed to the presence of impurities in the detection screen.

Further work requires to identify the precise spots of these elements and then further analysis with more precise techniques. Again, statistics is a very important factor. In further experiments we will run the X-ray gathering for a longer period in time to see more detail on the spectra.

A strange, but consistent observation is that the detection of the "foreign" elements always occurs at the same spots. Varying the position of the electron beam a little bit increases or decreases the relevant heights of the peaks, but the peaks remain all together visible at the same spots. What we mean is the following : it is not Fe sitting somewhere and Zn sitting on a totally different area. If we find Fe then Zn is close as well as the other "foreign" elements and of course the elements that constituted the detection screen and the target.

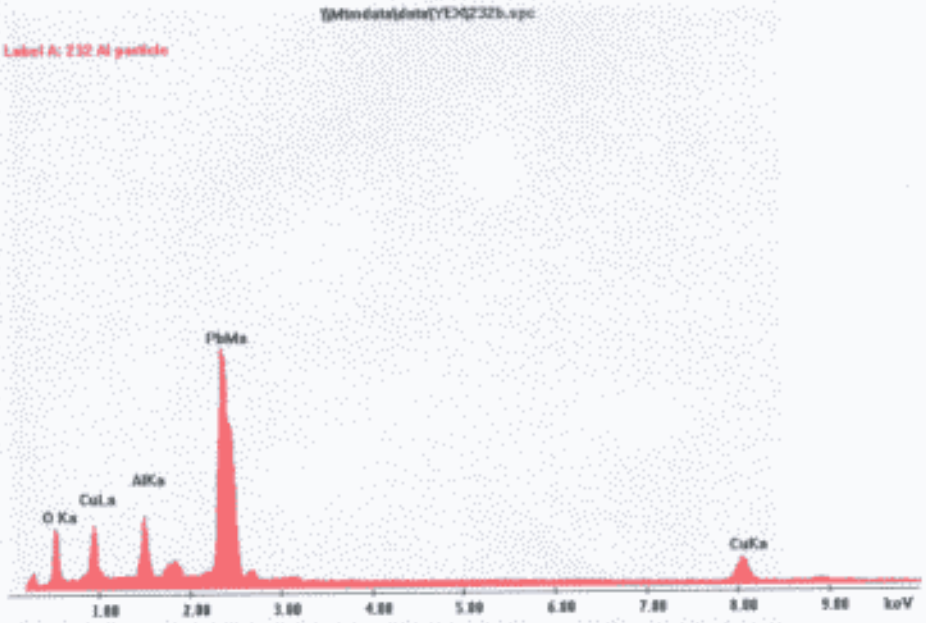


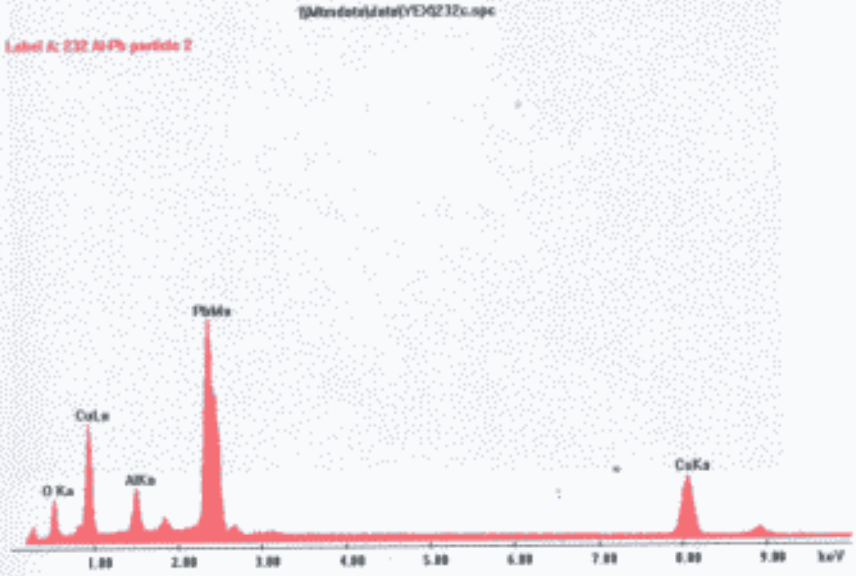
The next spectrum confirms the presence of the Si. Regarding the Si the operator said not to attribute much conclusions because from his experience Si can easily be a consequence of the oils in the vacuum pumps. Nevertheless the Si is only found very locally and not evenly distributed on the sample which you could expect if it is an effect of the oil in the residual vacuum.



Sample 232 is Pb on Cu, with artifacts in the neighborhood of the central hole. The parts look rather like parts of the initial target than redeposits of the "plasma" created in the shot. Therefore this part was not considered as very interesting.

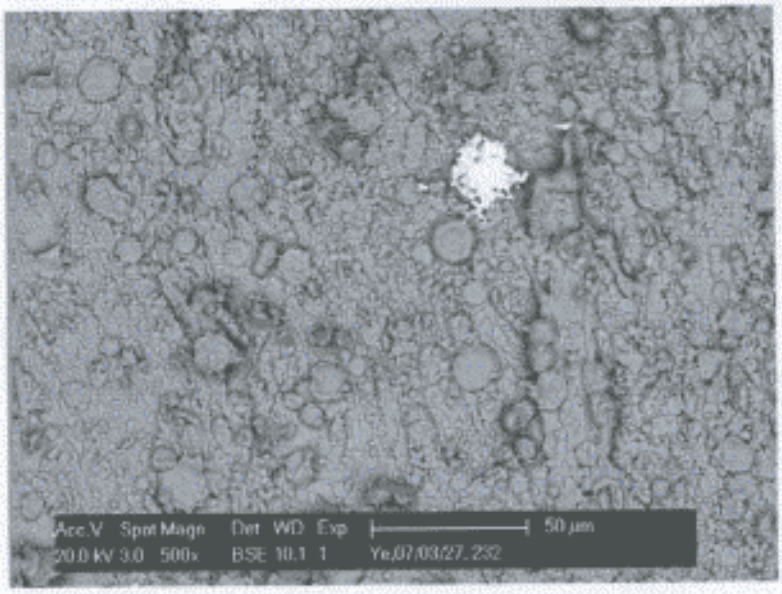
Besides that the presence of Al could easily be detected. This is a lucky shot, because the statistics in this case are not very good. X-rays were only accumulated for a very limited time until it was obvious that this or this peak was present.

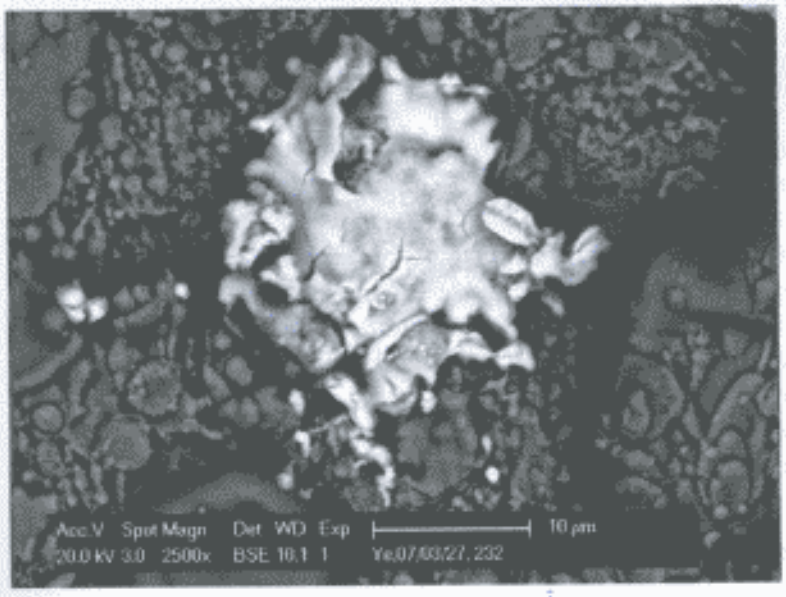


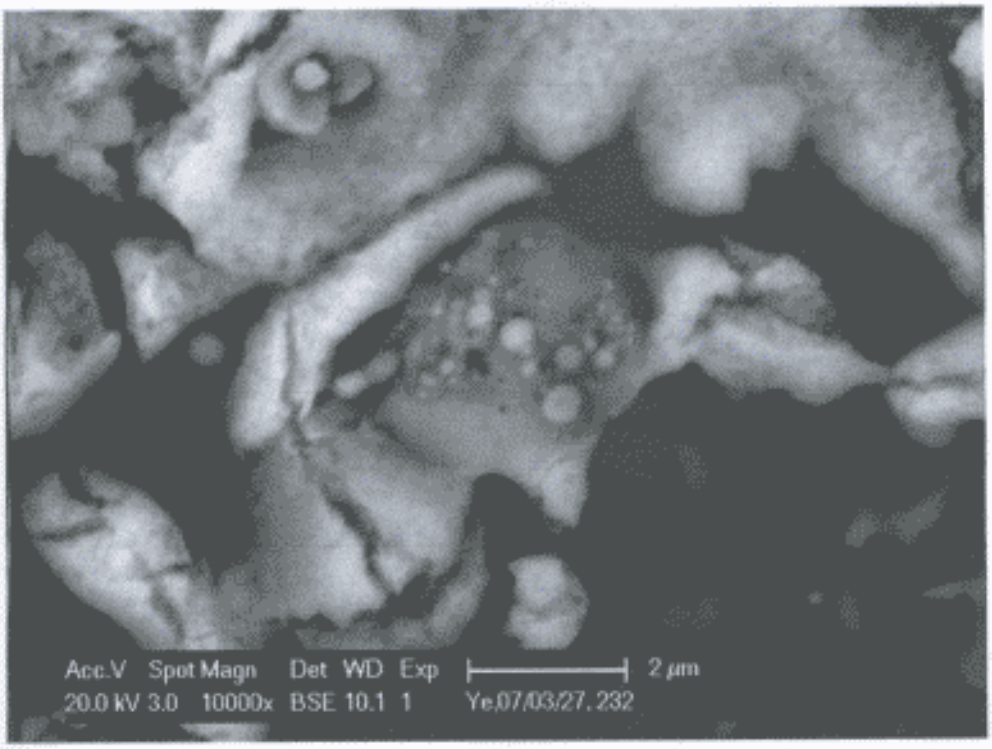


Depending on the exact positioning of the beam the relative Al peak becomes higher or lower.

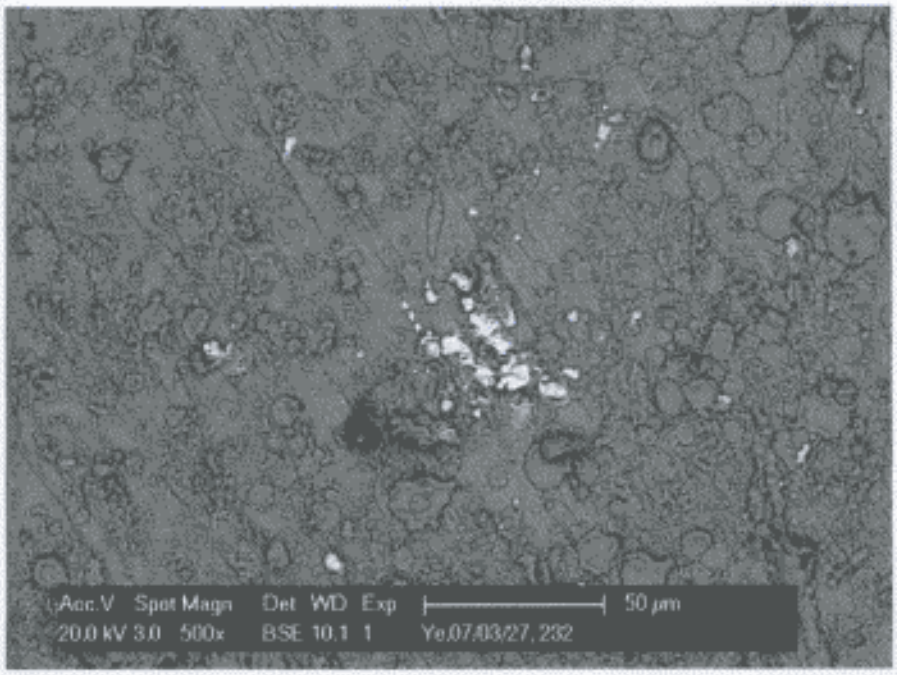
On sample 232 a redeposited Pb drop drew the attention. This spot clearly was born at the moment of the explosion because the morphology shows that is has dried in the sample. Further magnification revealed more interesting features.


Acc.V Spot Magn Det WD Exp 50 µm
20.0 kV 3.0 500x BSE 10.1 1 Ye,07/03/27, 232


Acc.V Spot Magn Det WD Exp 10 µm
20.0 kV 3.0 2500x BSE 10.1 1 Ye,07/03/27, 232



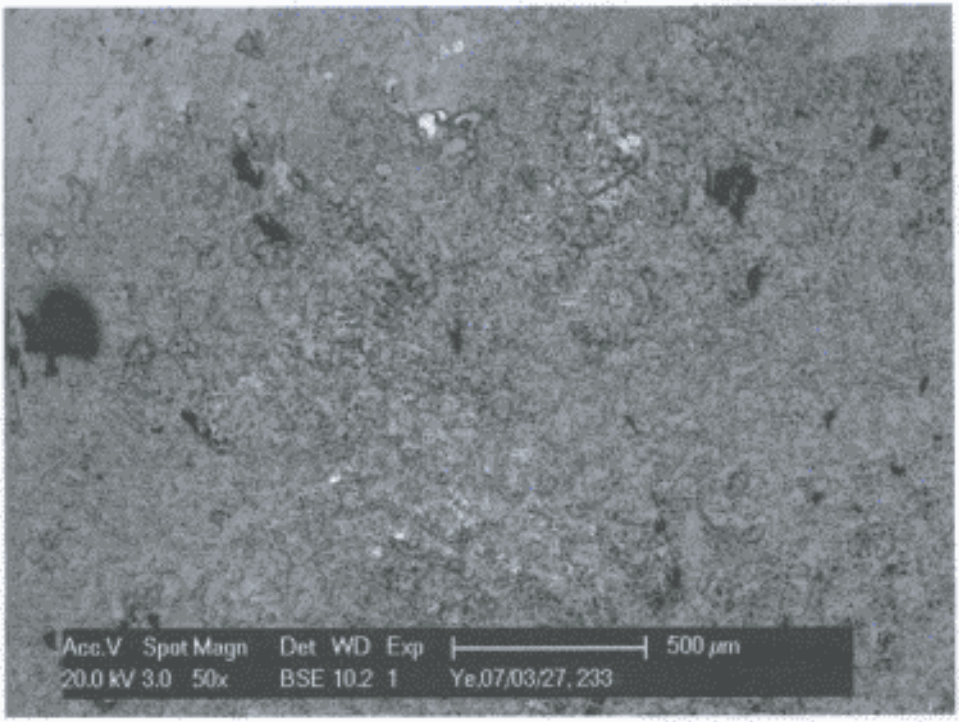
On this redeposited Pb splash, morphologically proven to have emerged during the shot, the smaller particles can be found. Once in the micron and submicron world these additional "balls" on the surface seem to be different elements. However, it is not always obvious upfront to identify the exact nature of the different balls. The spectra vary with the slightest movement of the electron beam. Since the "balls" have the form they have and are surrounded by other larger particles is is not evident to make a clear quantitive and even qualitative analysis of what exactly they are. The measurements of the x-ray spectra take with them too much of the surrounding matrix. So, again, it is only with larger statistics and/or more sensitive and precise equipment that we can further study the exact nature of these "balls" on the Pb that itself was created and redistribured during the shot and the subsequent splash.



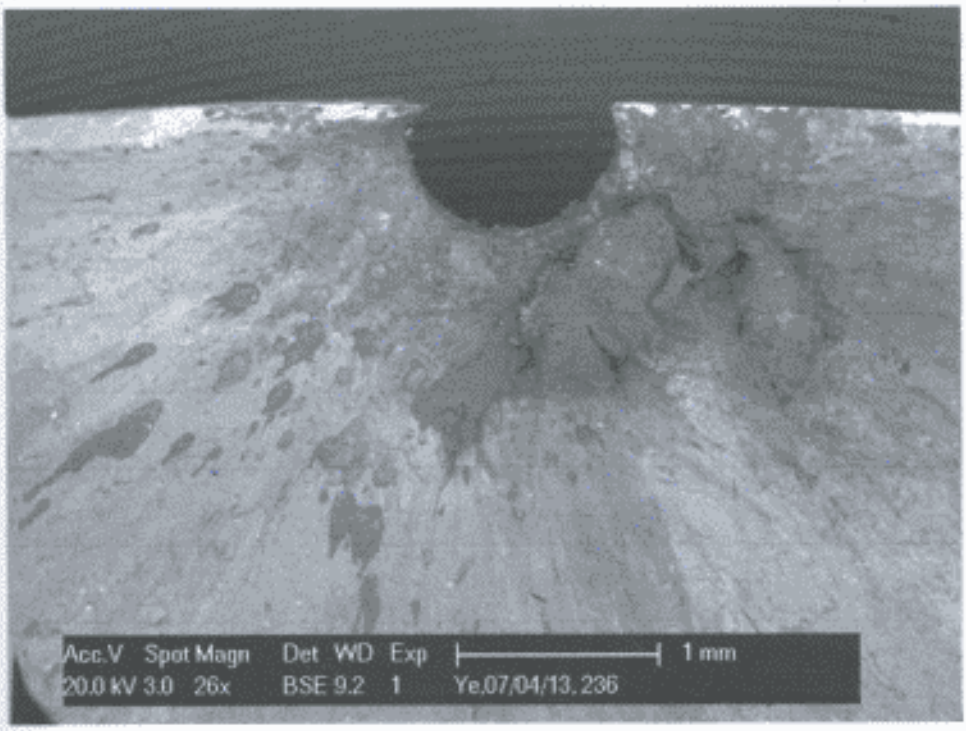
To finish on Sample 232 – which is a very interesting sample of Pb distribution on Cu detection screen – we can see everywhere evenly re-distributed particles that must have "splashed" on the surface during the shot. Our experience has shown that ON these redistributed particles the most "foreign" elements can be observed. In the case of the picture above, the redistribution of the "splashed" material spreads exactly 50 micometer in a circular form around the point of impact of the Pb particle on the redistributed Pb from the target lying on the top of the accumulation screen.

What is the point that we try to make… ? The regularly redistributed target material from the shot does not represent any interest for us. The splashes on top of the redistributed Pb on the Cu screen represent the parts that were deposited during the shot. Those are considered to be the result of the "plasma" in the top of the target. It is on those splashes that the "foreign" elements accumulate. In the assumption that the splashes are a consequence of the redistributed plasma it is an indication (even a proof) that the foreign elements reside and are created in the plasma tip of the target material during the shot.

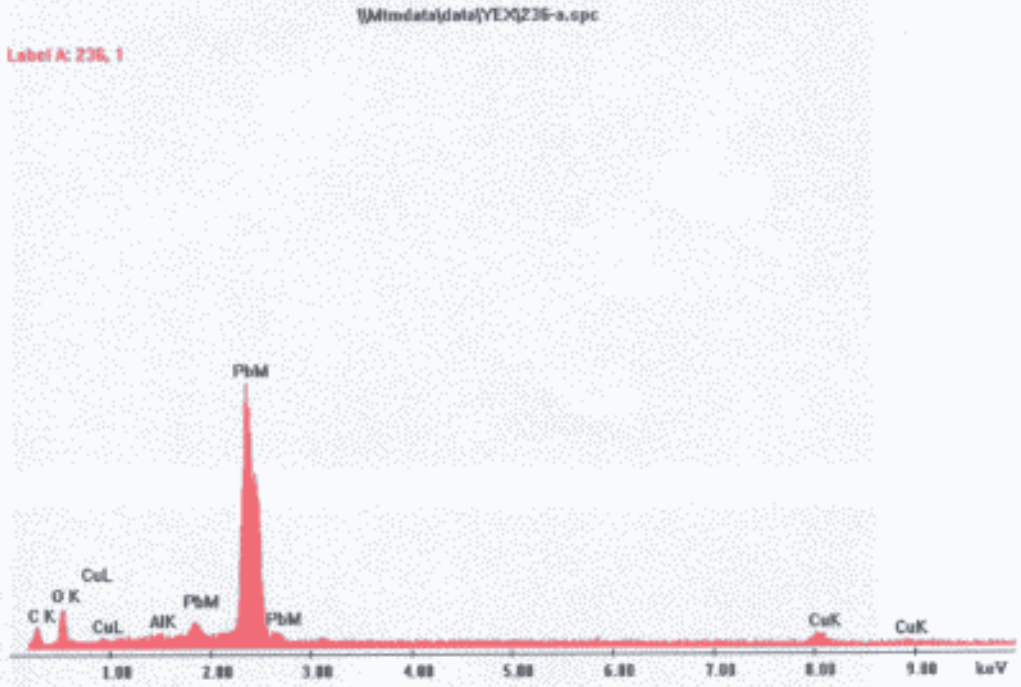
Impossible that they are redistributed there as impurities afterwards, because they sit on the redistributed Pb. Impossible that they are a consequence of segregation from the target or even from the Cu detection screen as they sit on top of the redistributed Pb. Segregation could not occur in that way and could not put these foreign elements on top of the redistributed Pb.



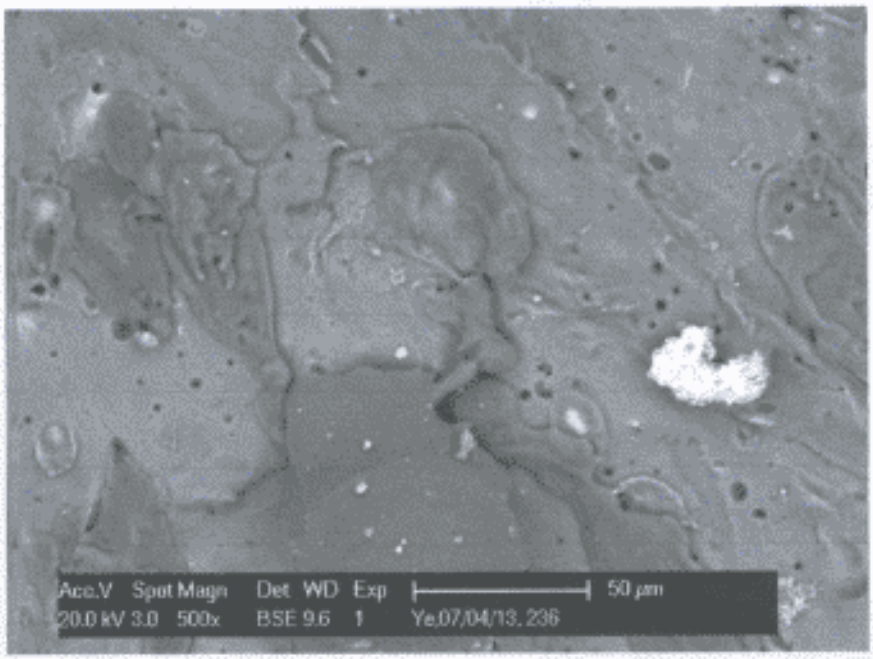
Sample 233 shows similar behaviour. A distribution of redeposited and transformed target material can be found on the surface. It is a matter of machine time to analyse the samples in details and to find more interesting artifacts that prove the theory explicated above.

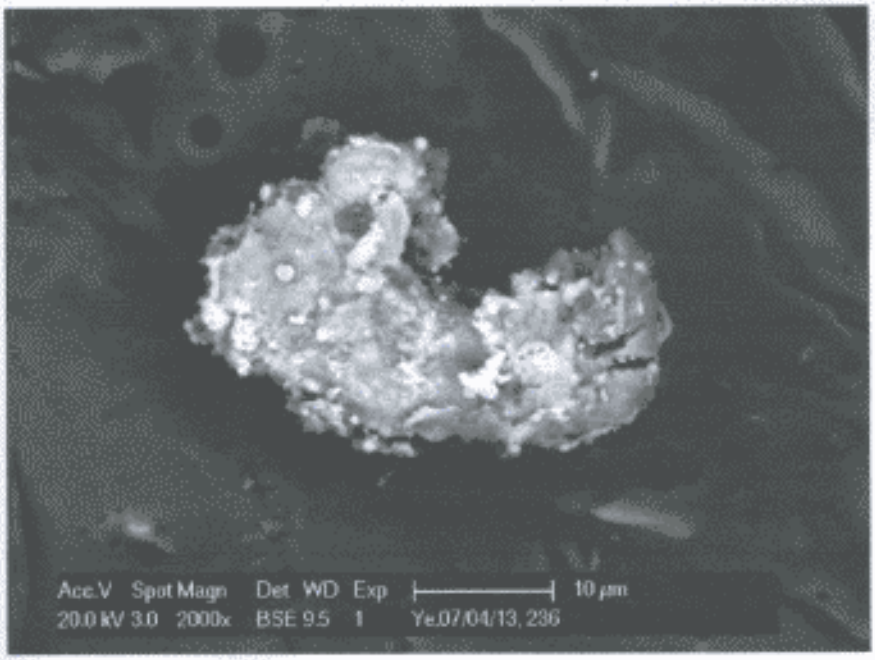


Sample 236 is another example of the same. Distribution of heavier elements on the detection screen. Each little white spot deserves to be investigated. Typically it is on top of these spots that submicron particles rest of different composition.



Improved statistics would show more detail and still better proof of the presence of the transformed elements. For a first screening these results are convincing enough.





The particle above on sample 236 is a wonderful case of redeposited target material from the plasma. It is an instance of a larger cluster where most of the particles are still clustered together and have not further exploded on the target surface. You can see on the first picture that the larger particle is surrounded by more smaller similar particles, probably coming from the same origin. The morphology shows clearly that larger particle is deposited on top and constitutes a series of smaller particles of different composition.

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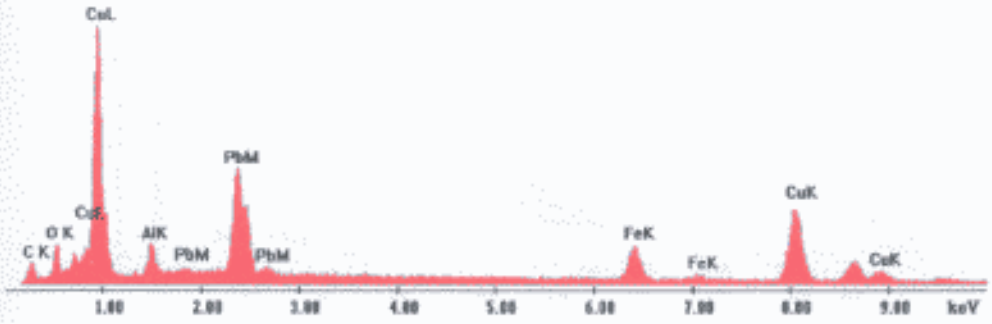
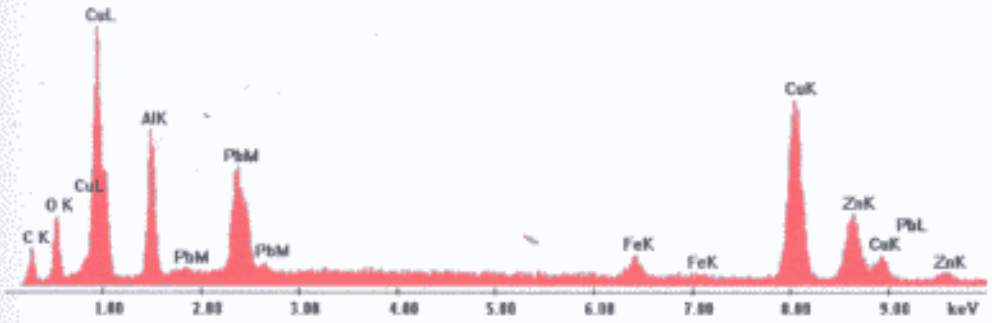
Label A: 236, 4



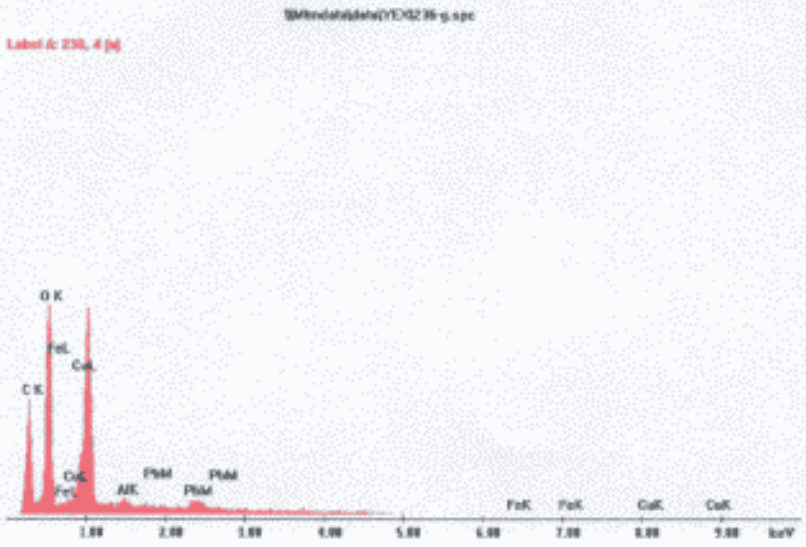
First high level analysis of this particle reveils immediately the presence of “obvious” foreign elements in larger quantities.

\\Mmdata\data(YEX)\236-h.spc

Label A: 236, 4 [b]

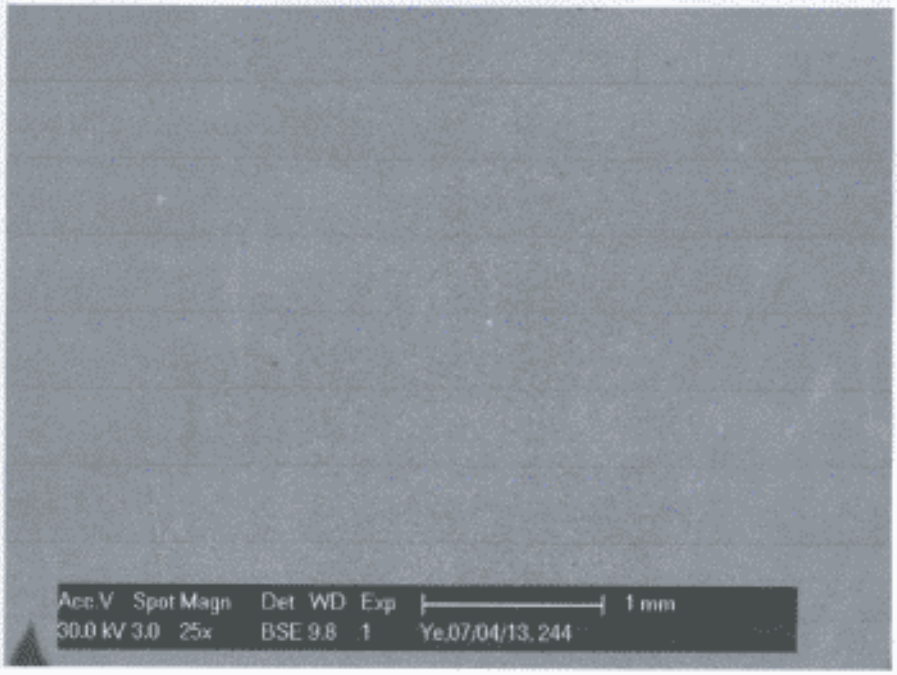


Zn, Cu, Fe, Pb, Al, Cu, O,… can easily be identified on the larger particle.



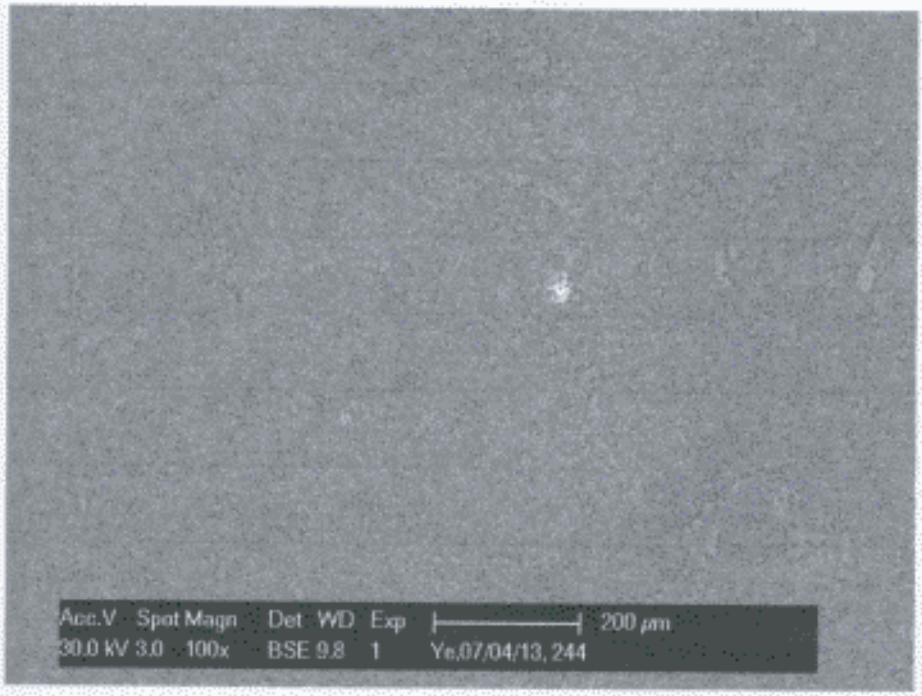
Experiments with lower energy were carried out in order to find out if the foreign elements are rather on the surface or in the core of the particle, but these experiments were not conclusive.

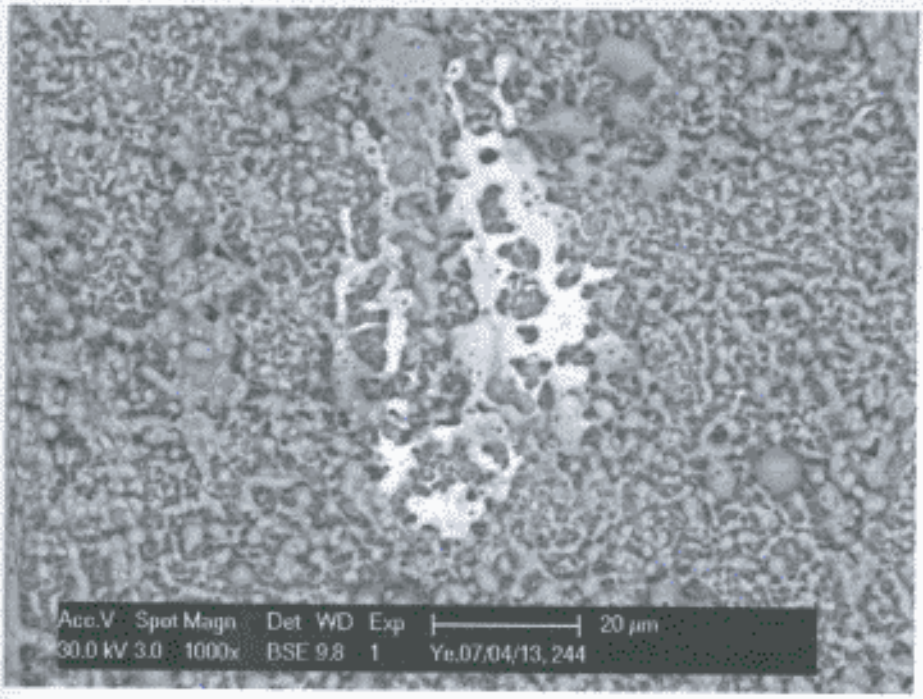
Conclusion only is that they can easily be detected and identified and that they always sit on the redistributed particles as "sub" particles on the redistributed particles.



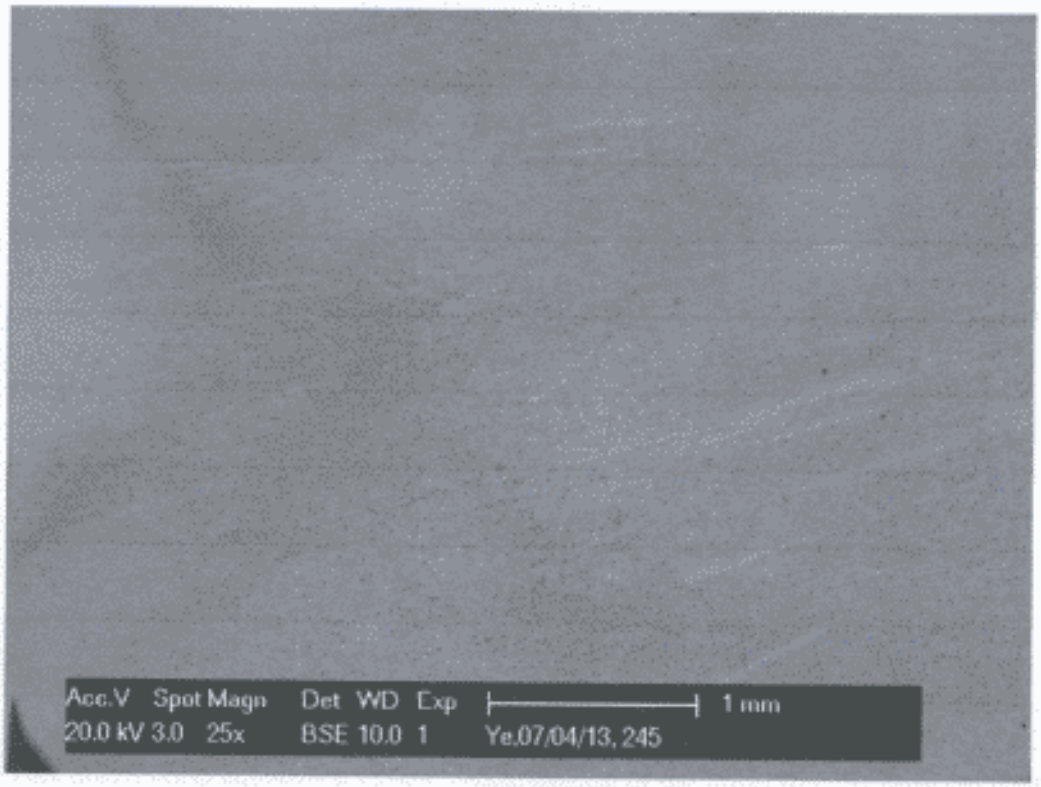
Sample 244 is one of the "larger" detection screens that were especially created in April 2007. The same type of analysis leads to the same type of conclusions. "White" particles can easily be found (although on this sample less artifacts were found than on the previous series of samples). This is shown on the picture above.

With the electron microscope from there, the operator can switch to higher magnifications bringing more detail about these redistributed particles.



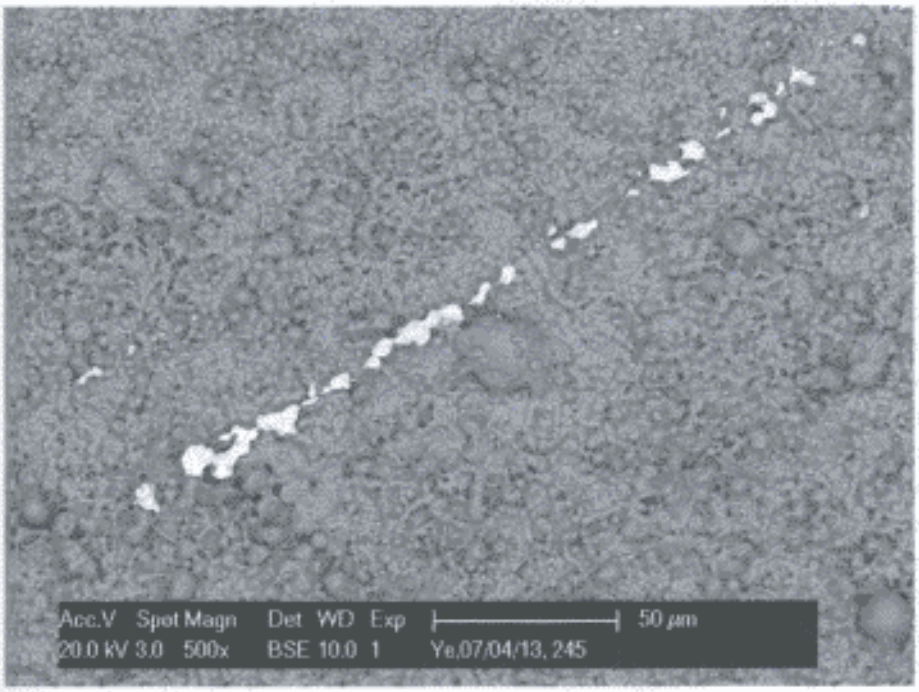


Visual inspection shows that the spot is also lead, but containing also heavier elements in it. It is created at the moment of the shot and is morphologically melted into the redistributed target material on the Cu scrèen.



Sample 245 is another "large" accumulation screen sample that was shot. Again similar observation can be made. In this case of the picture above the "stripe" in the center drew our attention. It is a "stripe" sitting on the surface, created at the moment of the shot, morphologically molten into the redistributed target material and put there in a violent way. The effect of lighting up is a consequence of both charging and heavier elements present in this stripe.

In this case we were interested in the direction of the stripe that did NOT correspond with the radius towards the central postion of the target on the Cu accumulation screen.



This distribution suggests a violent redistribution of the material (Pb) from the central part of the Plasma in the Pb target (because the surroundings are evenly redistributed Pb).

The stains are violently put there as a last step in a violent process involving melting of the (transformed) Pb particle and explosion of the bubble above the surface to create the line effect on the sample.

The particles making up the line are of the order of microns thick and require further analysis anyway.

Conclusion :

We have sufficiently proven the presence of foreign elements and we have suggested a technique to identify them easily on samples. With this information we need to do things : first get more statistical analysis on these particles that are assumed to come from the plasma created in the shot and secondly go to more detailed analysis techniques to determine the isotopic composition of these particles. It is enough to prove one or two to be different from isotopic composition in nature to get convinced that the plasma deposited particles have been nuclearly transformed.

Up to the level of nuclear transformation the measurements genuinely confirm the Proton21 measurements except that they have been carried out blindly by uninformed operators without any interest to change any experimental finding. The data are given "as such". The data come from previously existing samples and from samples that were

specifically created for the experiments. All findings point in the same direction and do not contradict any statement of Proton21;

There is no doubt : experiments have shown that nuclear transmutations take place whatever the theoretical explanation could be.
Let us look at the experiments. Samples made from very pure metal are exposed and the treatment results in a micro-explosion of the target as can be seen directly under an optical microscope. During the explosion material is ejected and such ejected material has been not only detected on the ground of the morphology, but also intensively analysed by many methods, one of them being the microprobe X- ray analysis. The x-ray energies are very characteristic for one element; consequently if one detects x-rays with an energy corresponding to a particular element, which is not the element of the starting material, it is a clear sign that initial material has been changed into another element. Such a change requires that the number of protons and neutrons is changed. It needs a transmutation at the nuclear level. No doubt, there is not any other explanation except for a weak criticism. Could it happen that before, during, or after the micro-explosion one would have a precipitation of contamination with the different elements, which are detected by X-rays?
Such critical arguments can be waved away or at least strongly weakened by the correct interpretation of the existing experimental results. Let us summarize our arguments against such criticism:

1) Extreme care was taken in all stages to prevent any contamination from the exterior world. Critics could ask if the precautions are indeed good enough and therefore this answer alone is not sufficient, but one can give better arguments.
2) On a picture of the electron microscope of the accumulation screens, one can distinguish very clearly the ejections of material due to an explosion in top of the target. The argument is that the "new" formed elements are found in these ejected material and not elsewhere Conclusion : they were formed by the process which provoked the explosion.
3) The reliability and reproducibility of the process is secured in different ways.
   A)The experiments have been done and overdone on a large number of samples.
   B) With different target and collecting-screen materials.
4) The analysing technique is now verified by different laboratories in the frame of a verification process. However in order to ensure complete unprejudiced evaluation, the operator was not informed in advance of what could be expected. The elements to be found were left to his surprise and his skills to recognize an element.

As a conclusion: it is now verified that "new " elements are found in the processed samples and collecting screens in amounts that are not found in the initial material. Theses results are reproduced by three completely independent laboratories and must be considered as an experimental fact, which cannot be denied whatever theoretical model one could advance.
The only weak point left over, could be the answer to the question if perhaps some hidden source of contamination could really be completely excluded. In view of the

extreme importance of the previous conclusions and the tremendous perspectives it offers, one must wave back these arguments and there is a way to do it: isotope abundances. The main idea goes at follows:

The nucleosynthesis by which the elements which we find on our planet is an supernova explosion which ejected big quantities of material as star dust. By gravitation the dust collapsed to form finally the solar system. Thus we are stardust and the synthesis of elements was performed and finished before our planet was created and as a consequence elements on earth have a very characteristic isotope abundance distribution; it can be found on most of the chart of nuclides there are some small deviation for some elements which are also formed by decay of very very long lived nuclei like for example U 238. But for practically all elements the relative isotope abundances are independent on the finding place. And the spectrum of relative abundance is thus a signature of an element on earth. In fact it is a signature of the particular nucleosynthesis of the star-dust that collapsed finally to be our material on earth. If in the laboratory of proton 21 another nucleosynthesis is produced in a much different way, we can reasonably expect that the elements formed in that process may have a different distribution of isotopes. Thus if the "new" elements are found with an isotope abundance that differs from the one we find on earth, there is no doubt left: nuclear transmutations took place. If it would be contaminations, the isotope abundances must be the same as for the same element found on earth. If luck would not be on our side and we find the same isotopic abundances as on earth it does not prove that the new elements are contaminations because some believe that the conditions of nucleosynthesis will always end up in the same isotope abundances. However experiments published by the proton 21 group show isotope abundances of different elements Which deviate very strongly from the natural ones and we have thus all reasons that the measurements on the isotope abundances will deliver a proof of nuclear transmutations: the ultimate experimental proof which cannot be denied.