Experimental report on magnetic monopoles

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RÉSUMÉ. Les décharges électriques effectuées avec des fils de titane dans de l'eau créent des monopôles magnétiques. Ceux-ci sont visibles directement ou indirectement par leur action sur des plaques photographiques ou dans les poudres issues des tirs. Ce sont ces effets directs et indirects qui sont passés en revue ici

ABSTRACT: Electrical explosions of a titanium wire in water create magnetic monopoles. They are seen directly or indirectly by their effects on photographic plates or by properties of powders resulting from the electrical discharge. These direct and indirect effects are reviewed.

We report here results obtained from the trials done at Ecole Centrale de Nantes, comparing with the result of experiments conducted by L. Urutskoev. To be close to his work, our electrical discharges were performed on titanium wires in water. The discharge causes the creation of a plasma and a shock wave, and hence the device is installed within a metal enclosure (Stainless steel /Aluminum) to avoid radiation effects. The device is protected from the discharge by having a polyurethane insulation. This insulation has been covered with a 2 mm layer of Teflon for security measures. The only metal present within this metal enclosure is the Ti40, a high quality titanium. This setup was explained in a previous report of our work [1].

The results must be regarded as partial, provisional. They may be increased if the necessary improvements can be made. However, these results seem sufficiently important from a scientific point of view for us to present them. Direct observation of magnetic monopoles and their traces on film are reported in [2], in this article, we describe our other results.

1 - Stains

After each trial, the titanium powder from the fuse is collected along with the water contained in the trial chamber and are placed under a photographic plate. The traces are produced, not immediately in the electric arc, but by what remains in the water and powder, and leaving several hours after the electric arc. Sometimes, something go out of the water, it is not only the objects that produce the traces, but also a part of the powder on the surface of the water. They emerge from the water, despite gravity and the surface tension of water, and are glued on the wrapping paper of the photographic plate :

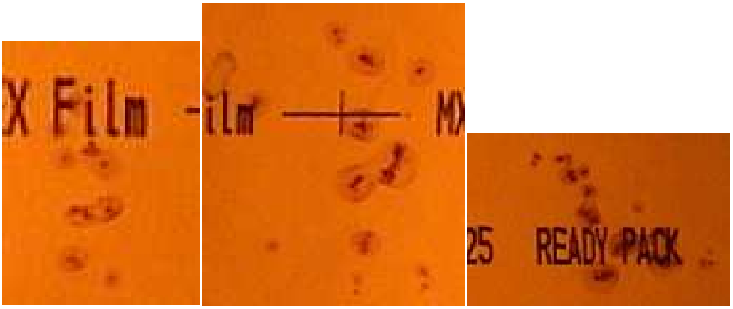

Figure 1 : Stained paper, experiments 103, 62, 79.

2 - Powders

The inside of the shooting pot in which the spark occurs contains only water and titanium. The titanium fuse is tightly placed against the metallic pieces which are also Ti40. The electrical insulation is ensured by polyurethane, chosen for its insulating and mechanical qualities, and the protection is doubled by use of Teflon on the polyurethane insulation. Despite all these precautions, we continue to get in these powders various elements other than titanium, especially iron and copper.

Caution is necessary for the interpretation of results : To prove that there are transmutations, one must ensure that the elements found in the powders could not be supplied by the titanium wire. When one analyses the titanium used to make the fuse, in the same device that analyses powders, the presence of elements other than titanium is beyond the precision of the device. One could even imagine that copper is hidden as trace elements inside titanium. But we have, also, analysed trial no.

124, in which the electric spark has gone through unforeseen places : the fusible has been reduced to powder, but it did not reach as high a temperature as usual. The spark attacked the lid of the trial chamber. The analysis of the powder provided no foreign elements. The only elements that were found in the powder from this trial are titanium from the fuse and the alloys of Fe-Cr-Ni from lid. The composition of Fe, Cr, and Ni was analysed and was found consistent with the manufacturer of this alloy. This validated the confidence we can have in the accuracy of our instrument.

It is then right to think that when we find copper in the analysis of the powders, it was not present in the discharge chamber before igniting the spark. According to metallurgists, the presence of macroscopic particles of impurities like concentrated iron or copper inside a titanium wire would be highly unlikely. In addition, we just found that pieces of titanium clamped on the fuse and which are in contact with the spark contain products of transmutation which can rust if left for a long time in open air. It is therefore quite certain that the changes in chemical composition of the metal are a practical consequence of our electric arcs.

Our results are very close to those of Leonid Urutskoev and fully confirm the physical reality of these transmutations. However, we have lower production rates of foreign elements than from his experiments. This may be due to the fact that the energy used for our trials is lower. It can also be due to the difficulties in collecting all products due to transmutations, including those produced in the interior of massive titanium pieces.

Figure 2 shows the copper particles found in powders which are presented in two distinct aspects :

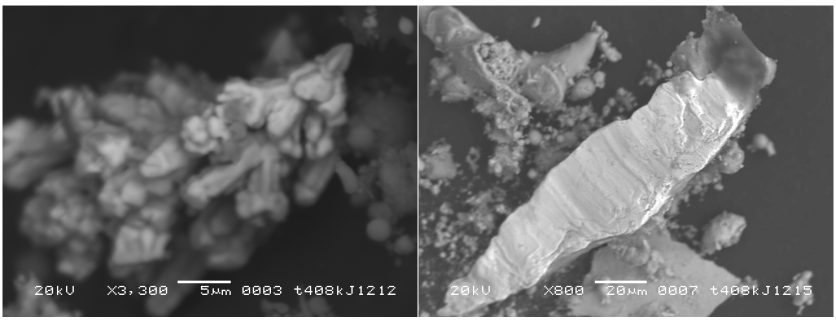

Figure 2 : Copper clusters, copper plates

There are many examples of these clusters in which one can see where the process started , and where it was stopped :

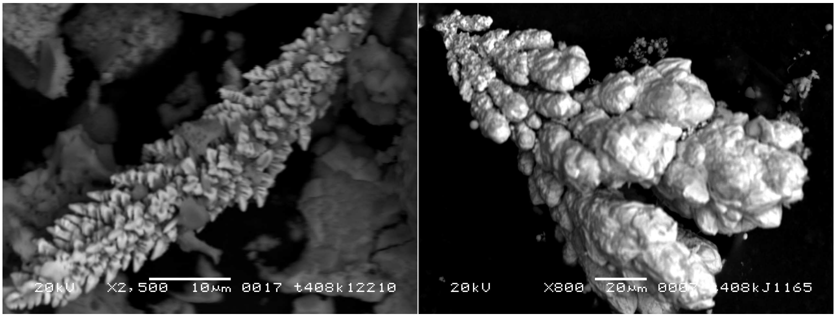

Figure 3 : Particles of copper

In the figure, the copper particles are brighter parts ; the dark parts are titanium particles. Be it copper particles or iron particles, elements other than titanium are very concentrated. If an analysis is done on a low magnification, giving only 1% of iron from the analysed area, a mapping shows that iron is only found in few small areas. If the analysis is done under higher magnification, at certain locations we find more than 90% of foreign elements, and often less than 1% of titanium.

The necessity of transmutations to report the results of powder analysis was put in evidence by L. Urutstkoev [3]. The additional observations that we made compared to its work are the highly concentrated nature of the products from transmutation. Everything happens as if, when transmutations are possible in one place, almost all titanium is transmuted. This is not trivial, because it is very different from all mechanisms of interaction so far known in nuclear physics. In weak interactions, there is indeed a possibility of nuclear transmutations. But this occurs in individual nuclei, at random in time and space. Furthermore a nucleus becomes a neighbour-nucleus, by the change of a neutron into a proton or vice-versa. In strong interactions, everything happens inside the components of nuclei that are protons and neutrons. This completely differs from what we see here : A very large number ($\approx 10^{19}$) of titanium atoms are changed locally and almost entirely.

So here we have a strong indication of a completely new physics, with processes of change that can not be individual but collective. Why a collective process ? Constraints resulting from known physical laws are very strong : given the low energy brought into play for each titanium atom, we can consider that the transmutations must occur with conservation of the total nuclear binding energy. We also have the constraints of conservation of electricity, of the baryon number and of the lepton number. It is impossible to satisfy these constraints with just a single atom of titanium, or even with only a few of them. Then one might think that it is even more impossible that a large number of titanium atoms are transmuted into copper atoms. And this would indeed be impossible if it was only copper. It is necessary that the transmutations be in accordance with the known laws of conservation ; so copper must be accompanied with other elements presenting fewer neutrons and having less binding energy than titanium, since copper has more. And this is the case in our powders, because the copper we get is never alone. Results from the analysis always indicate the presence of some oxygen, carbon, sulphur and sometimes aluminium. And the spark also produced and released hydrogen which may partly be a result of these transmutations. Similarly iron is never alone ; it is often accompanied by chromium and nickel, or by 1% of manganese in their absence. Iron is also accompanied by other lightweight elements, hydrogen and carbon, oxygen, but also sulphur and chlorine in small amounts. The isotopic composition of all these elements from the transmutations should be interesting to be known. It is quite possible that it does not differ in compositions from common isotopes.

If there is nothing that prevents these transmutations, we are only at the beginning of a study that remains to be done to see how it goes, like what makes that copper appears here and iron there, how the radiation coming out of the powder acts, why probabilities that governed until now the entire quantum physics seem strangely absent here, how that affects our representations of space and time.

As the study of their traces [2] confirms the hypothesis of magnetic monopoles [4], their responsibility in the transmutations indicates that the general physics of these objects will be strongly different from physics of electric charges.

The collective character of transmutation processes involves new physics. This evidently remains to study.

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