Our Galileo Project March 2007 report

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http://csam.montclair.edu/~kowalski/cf/319galileo.html

“COLD FUSION” WAS A BAD NAME.

It implies one knows what is responsible for:

a) Excess heat,
b) Transmutation of elements,
c) Emission of nuclear projectiles, etc.

I prefer CINA; it stands for chemically induced nuclear activity.

Coauthors: [Names redacted].

Title of this preliminary report:

Nuclear or not nuclear ? That is the question.

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Motivation for this study?

Summer 2006 SPAWAR report, as described by Steven Krivit at

http://newenergytimes.com/news/2006/NET19.htm

A protocol was provided and we used it.

We did what SPAWAR people did and observed the same things.

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What are Cold Fusion researchers expected to do?

They are expected to offer a reproducible-on-demand demo of a nuclear process associated with a chemical process.

That is the name of the game.

Why is there a controversy?

Strong nuclear forces, responsible for emission of nucleons, or groups of nucleons, are believed to be independent of what happens at the level of orbiting atomic electrons.

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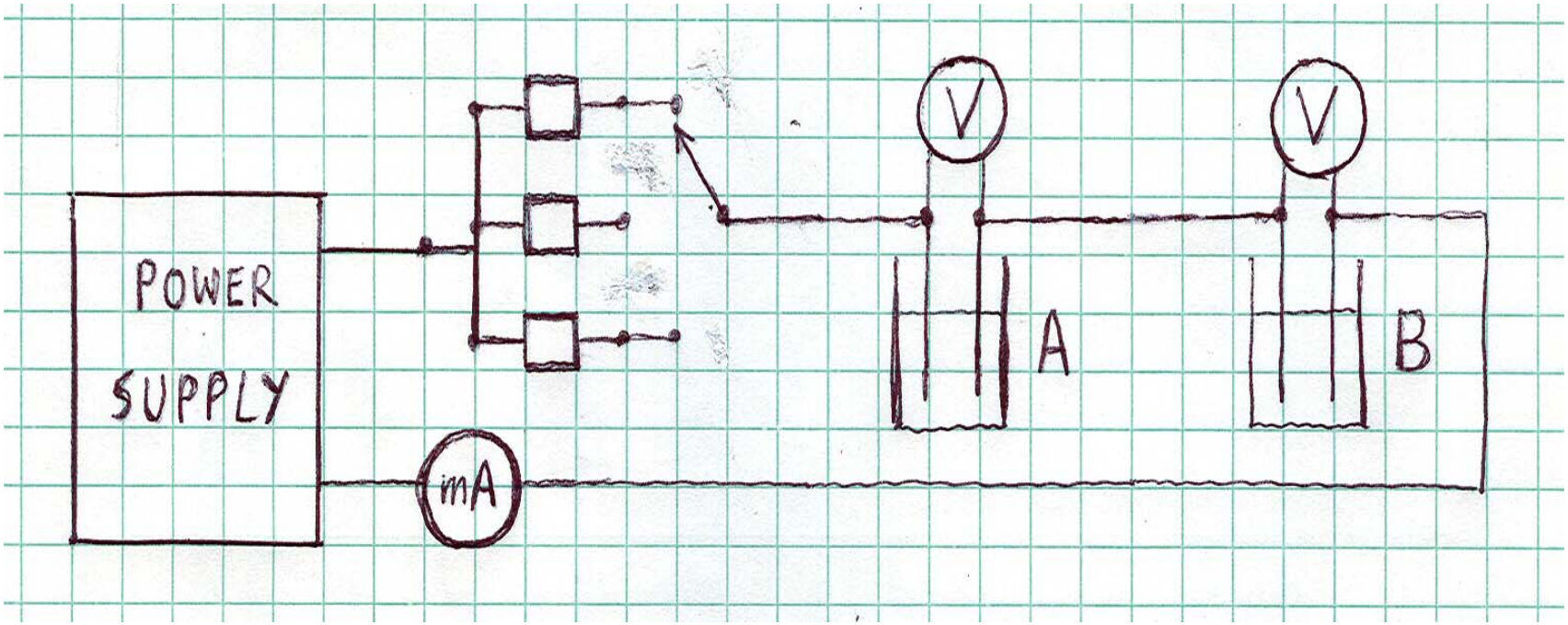
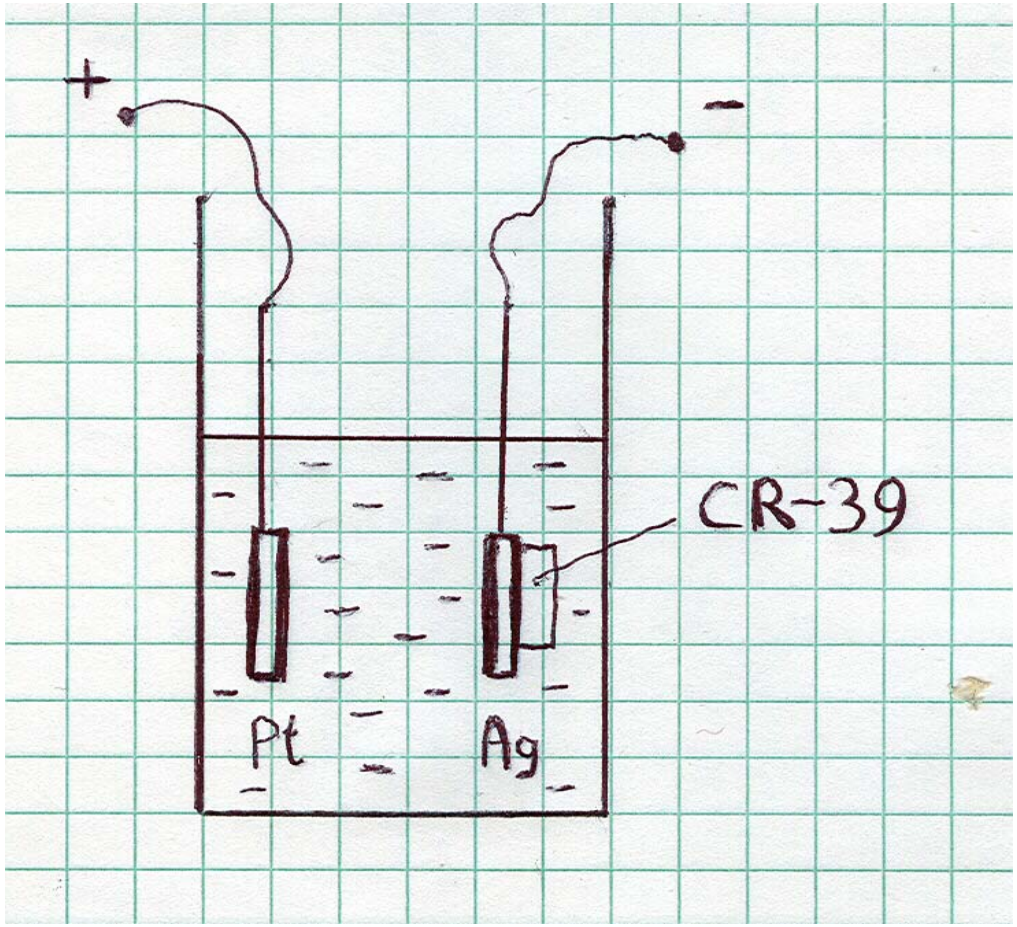
That was general background.

The “nuclear versus non nuclear controversy has been going on for 18 years. I am going to talk about our attempt to replicate one particular SPAWAR experiment, and share what I tentatively think about our result.


POWER
SUPPLY
mA
V
V
A
B

Electrolyte: LiCl 0.3 M + $PdCl_2$ 0.03 M



WHAT IS CR-39 ?

A plastic material (polycarbonate) from which eyeglasses are made.

It is widely used to detect charged nuclear particles, such as protons and alpha particles. Also to detect neutrons.

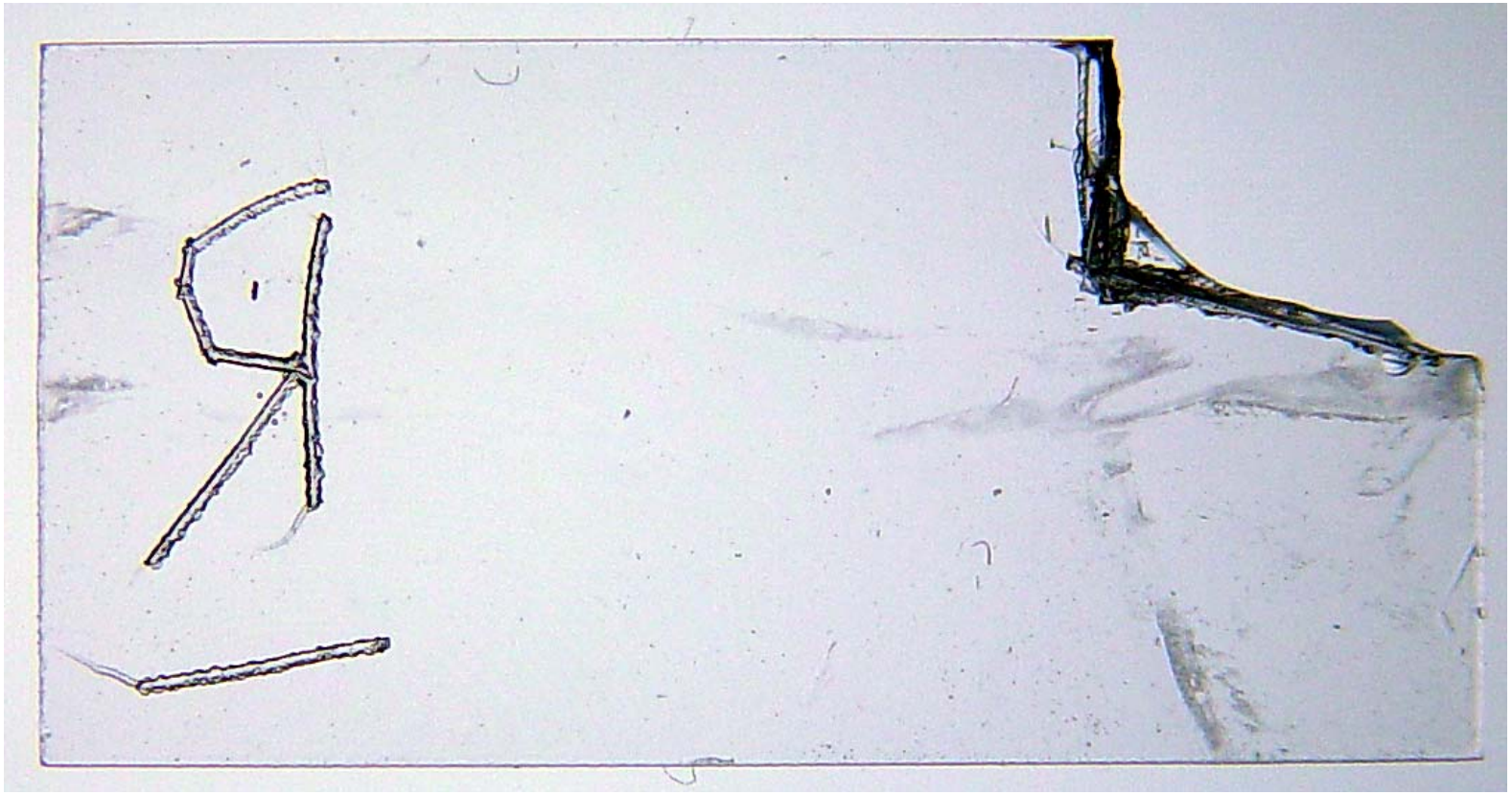
Tracks become microscopically visible after etching in hot NaOH for several hours.

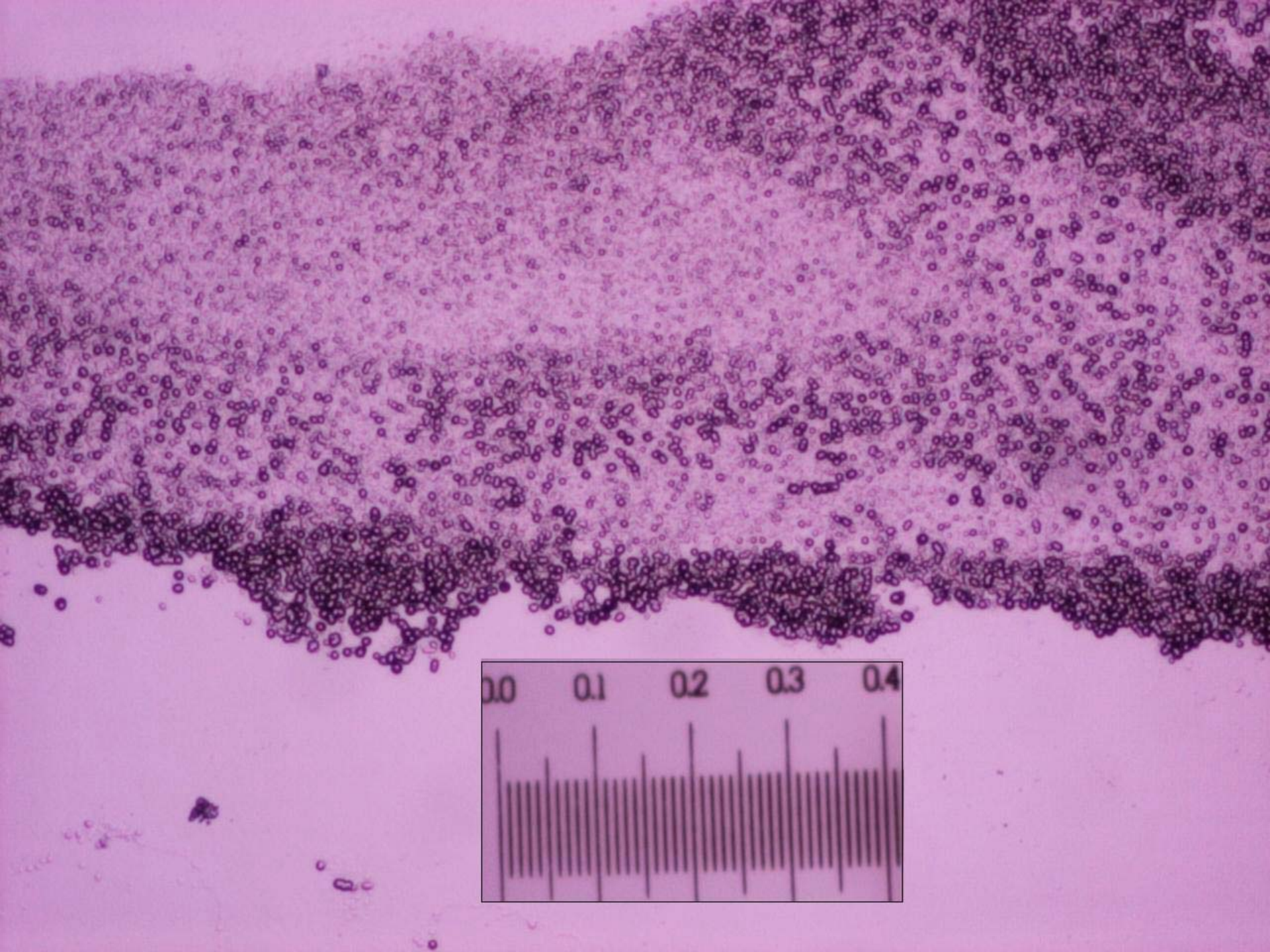
Duration of electrolysis

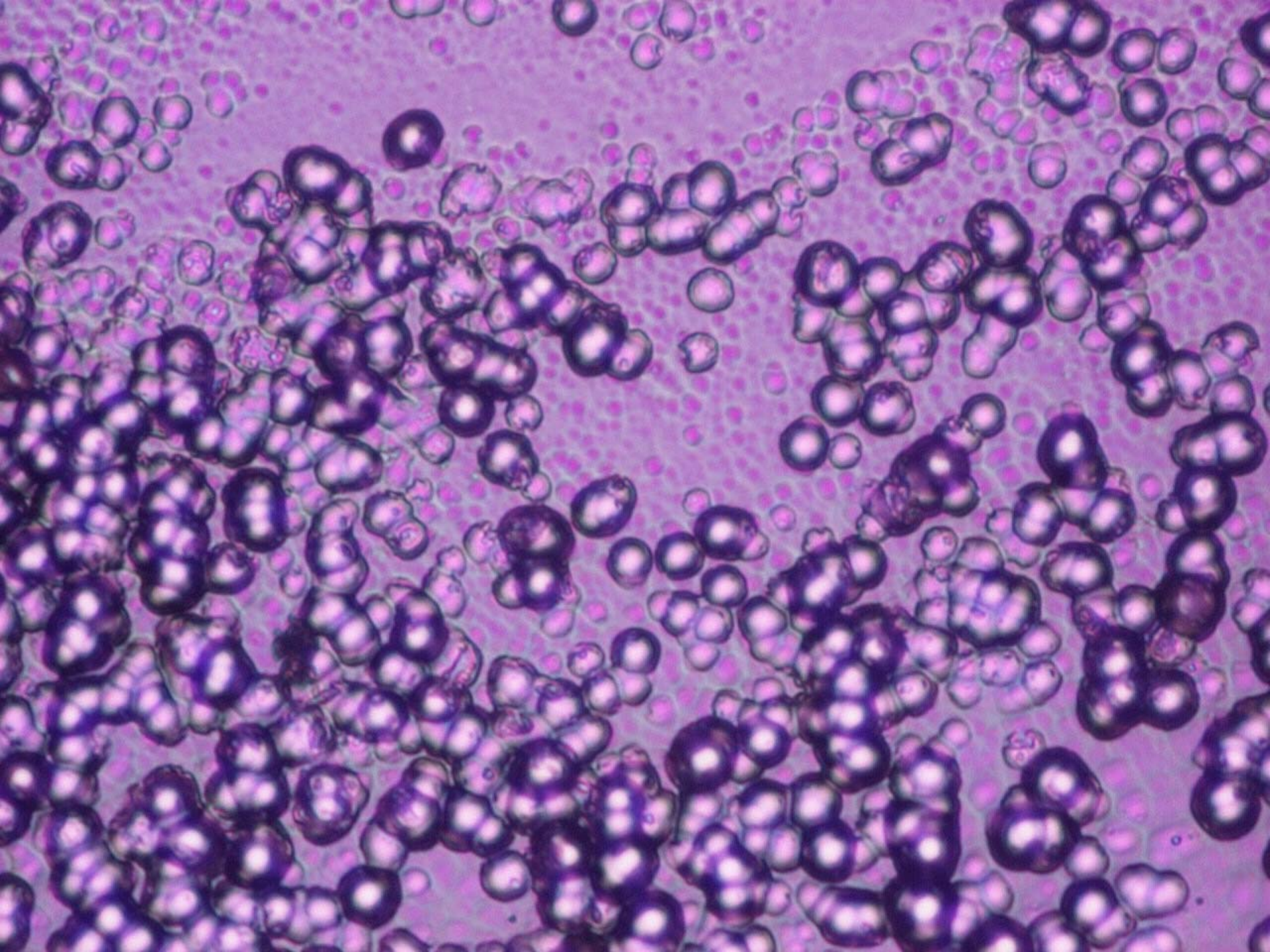
- Current 0.1 mA, 1 day
- Current 0.2 mA, 1 day
- Current 0.6 mA, 12 days, till the electrolyte became transparent

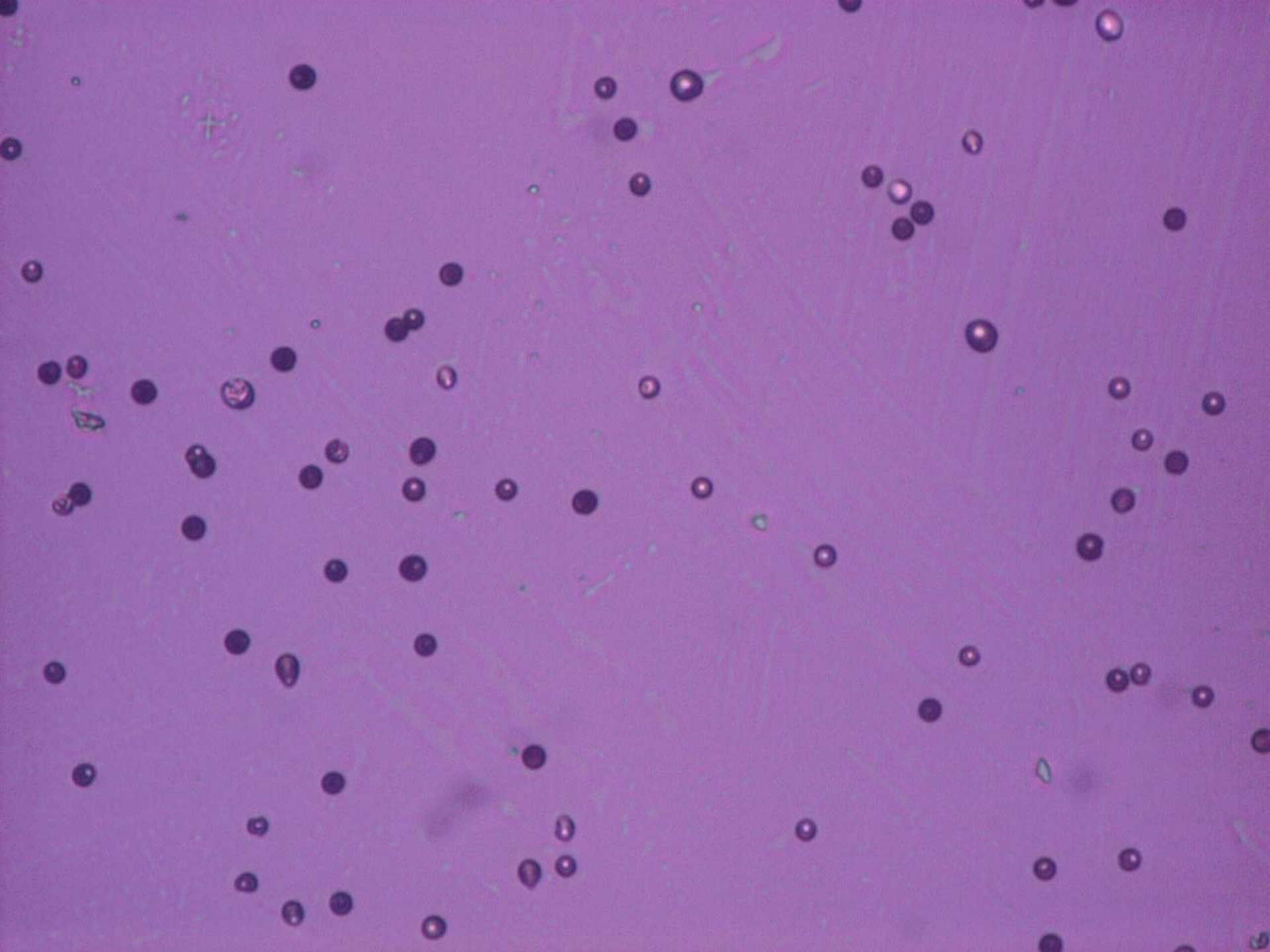
- Current 1.0 mA, 1 day
- Current 5.0 mA, 1 day
- Current 10 mA, 1 day
- Current 27 mA, 1 day
- Current 55 mA, 1 day
- Current 127 mA, 1 day

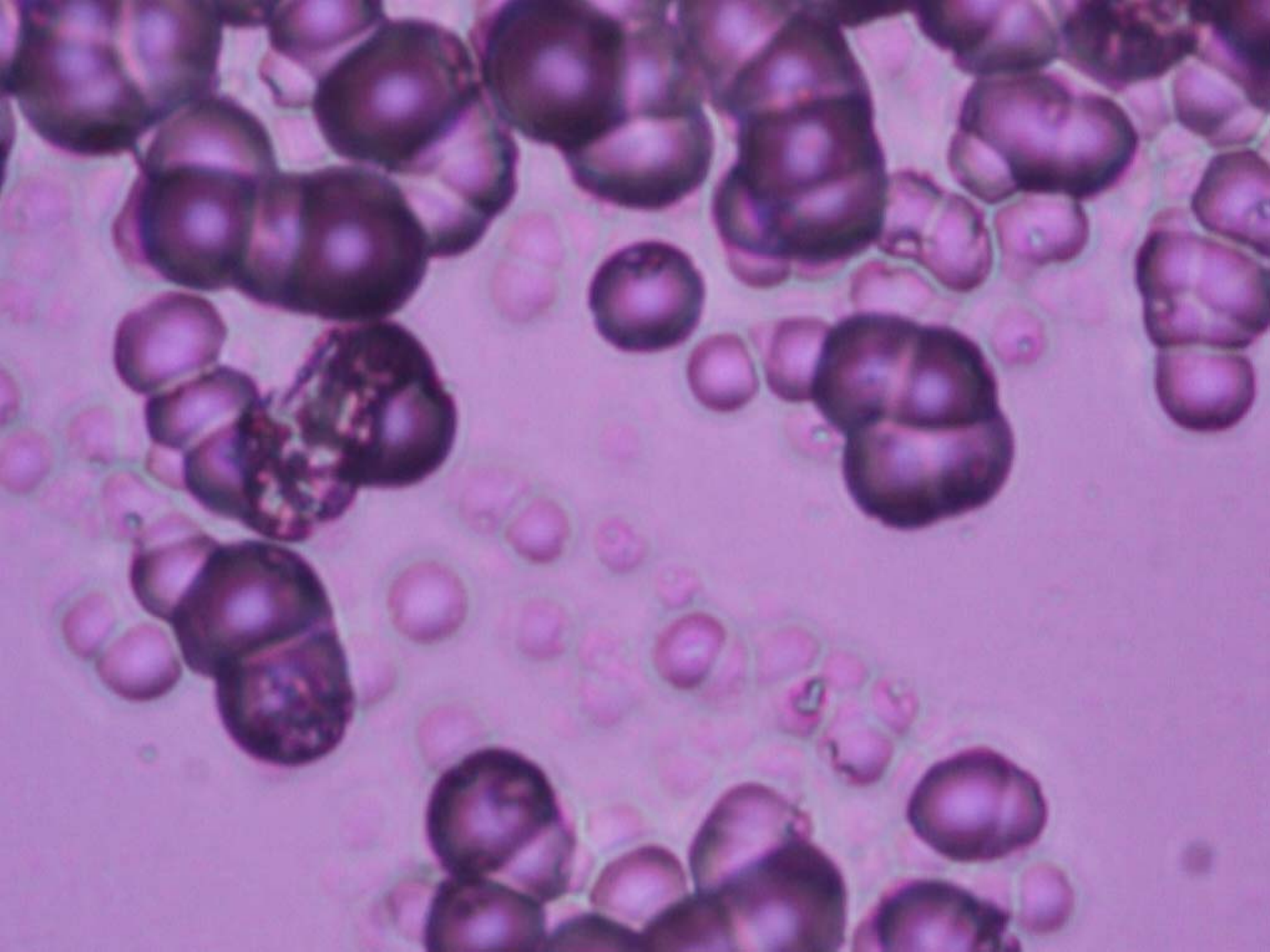
A digital camera picture

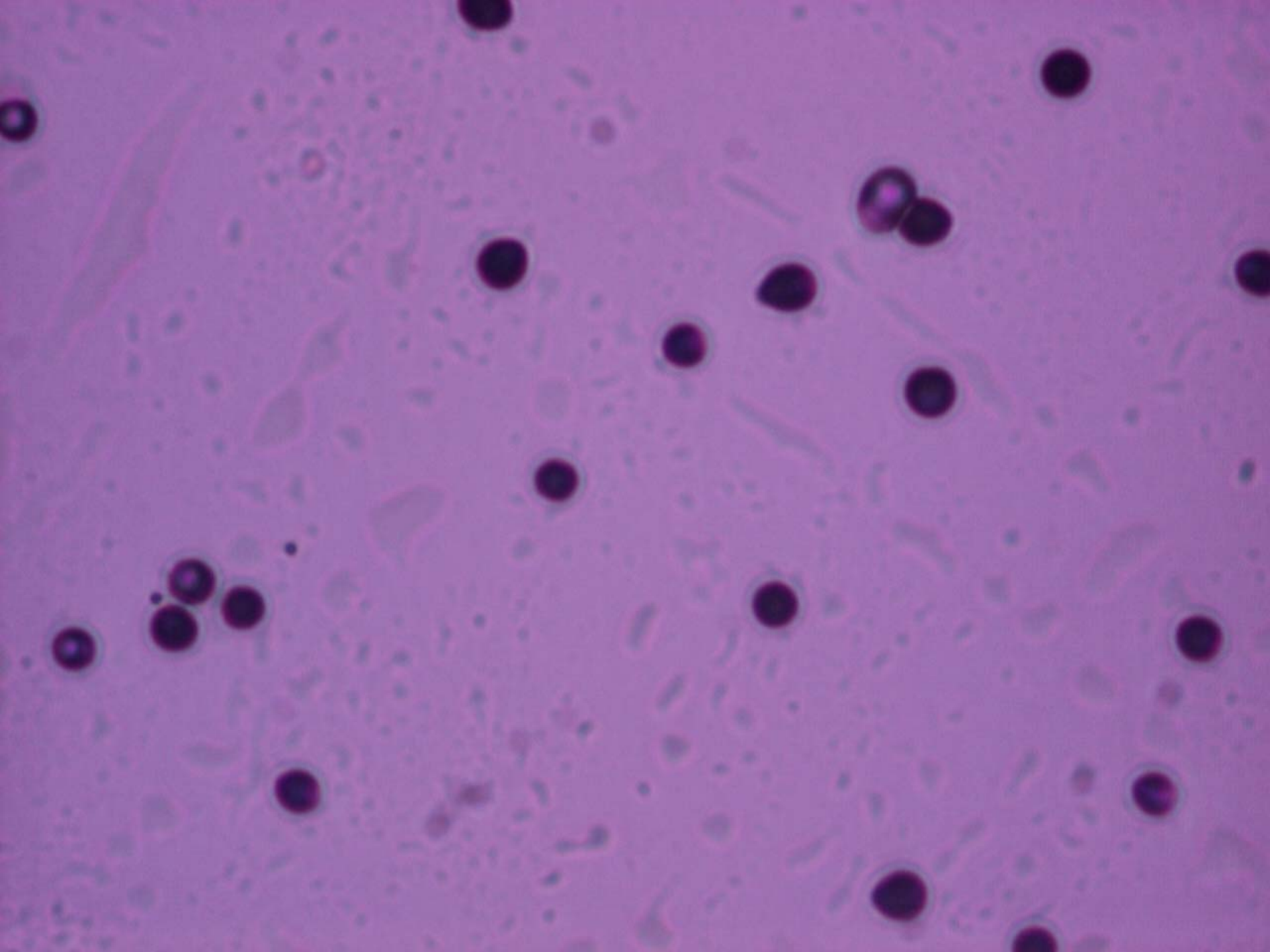



0.0
0.1
0.2
0.3
0.4









A.S. Roussetski et al. Proceedings of the 10th International Conference on Cold Fusion, pages 559 - 566

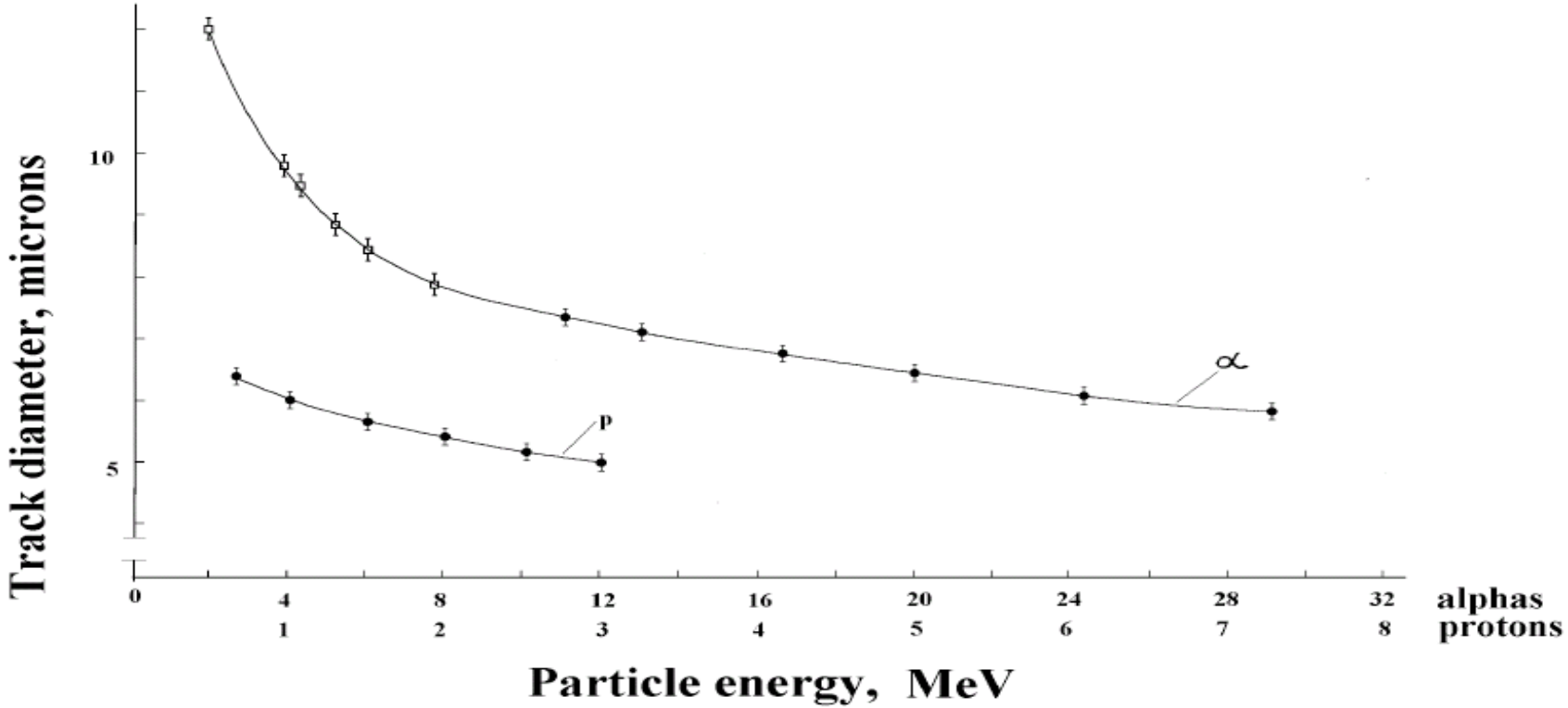
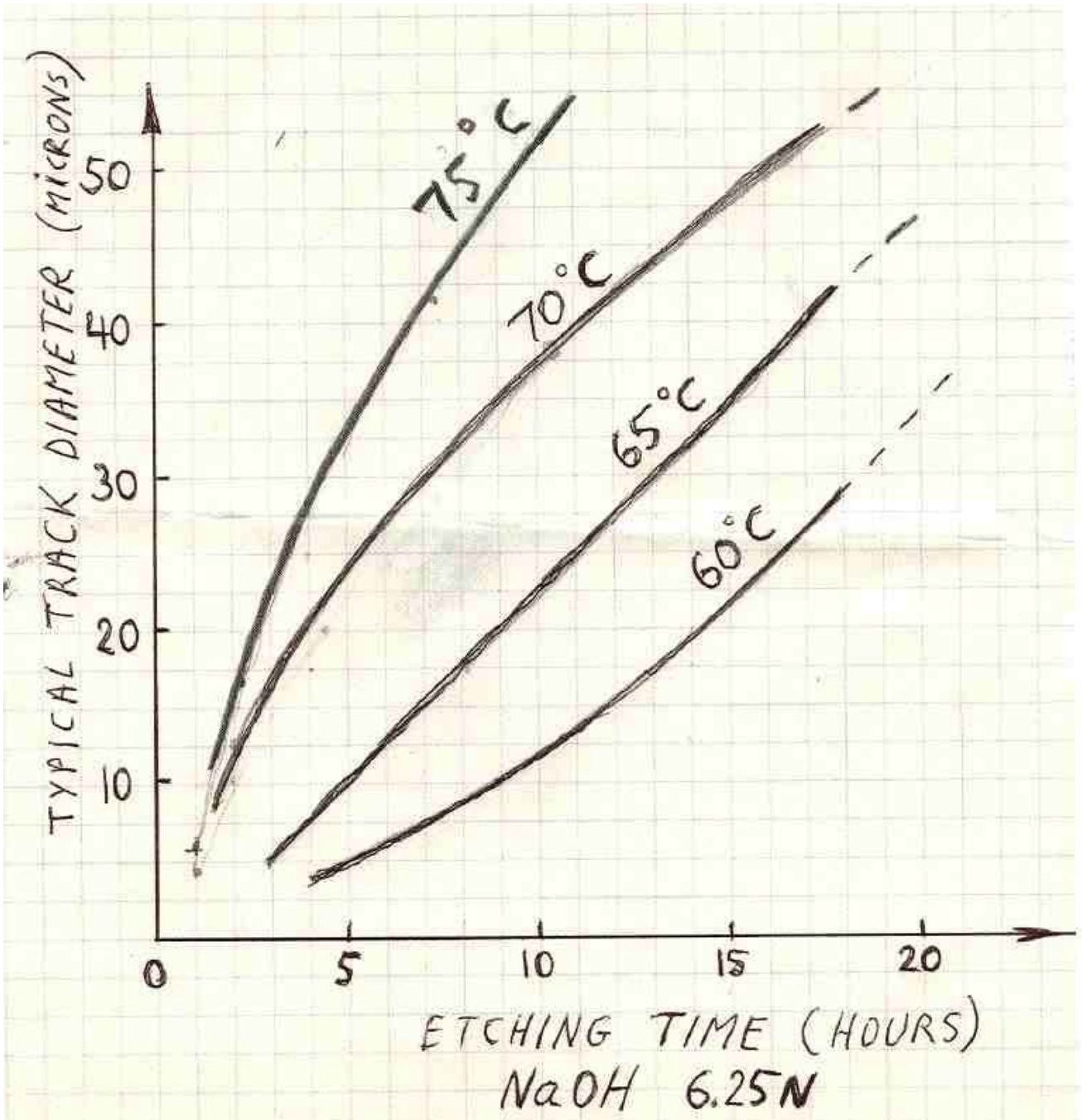
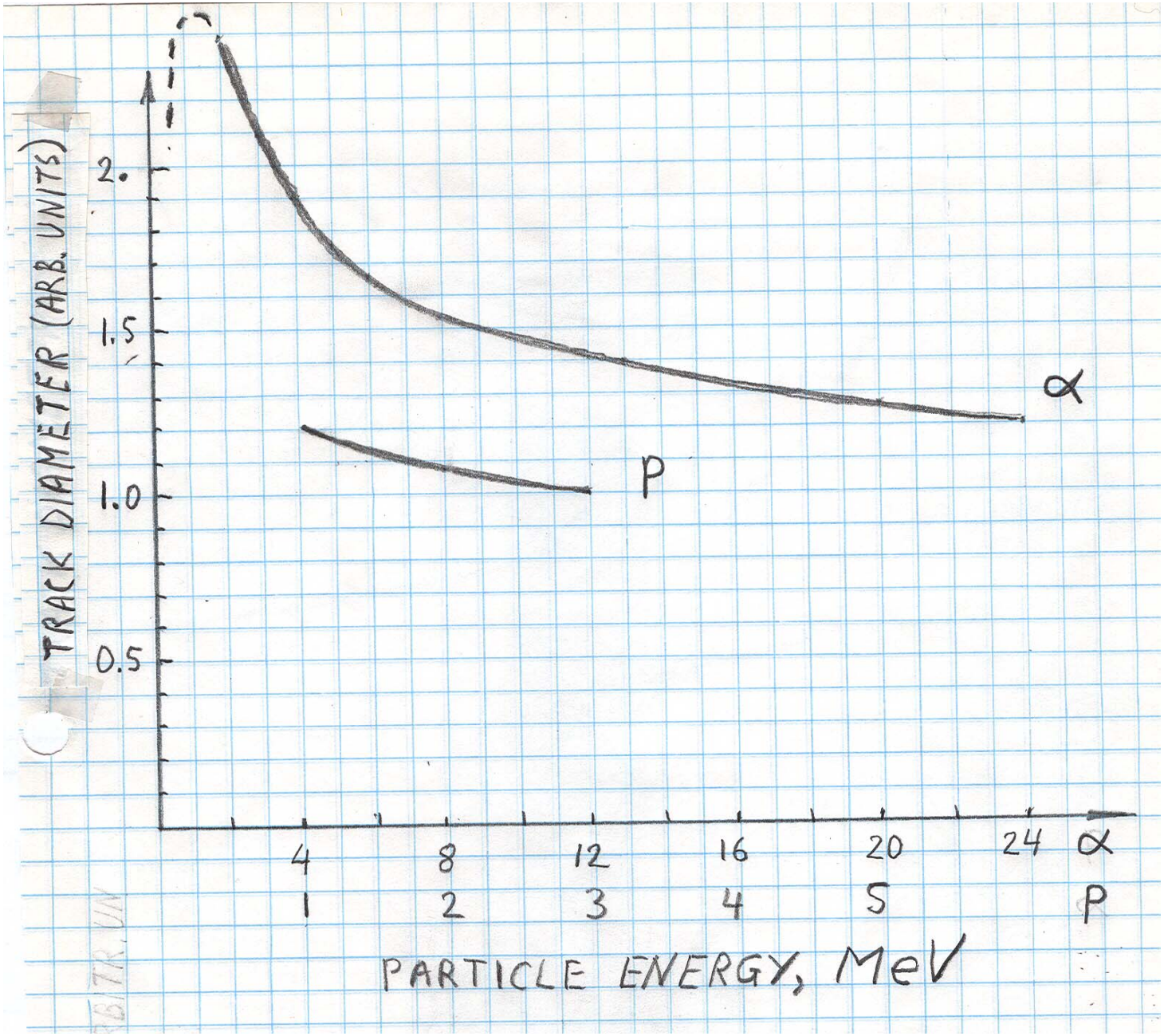


Fig. 2. The calibration dependence of track diameters of alpha-particles and protons on their energy. □ - radioactive alpha-sources, ● - particle beams.


TYPICAL TRACK DIAMETER (MICRONS)
50
40
30
20
10
75°C
70°C
65°C
60°C
0
5
10
15
20
ETCHING TIME (HOURS)
NaOH 6.25N


TRACK DIAMETER (ARB. UNITS)
2.
1.5
1.0
0.5
α
P
4
8
12
16
20
24
α
1
2
3
4
5
P
PARTICLE ENERGY, MeV

Large pits we observed cannot be attributed to alpha particles or protons, or neutrons.

Why not? Because of their diameters:

1.7*2.5 = 4.25 prots

Fission fragments would produce such pits. But I am not claiming that our pits are due to massive nuclear projectiles.

The magnetic field effect

The pits (large and small) were created only in the presence of a magnetic field (from a pair of neodymium magnets). How can this be explained?

We do not know how to answer this puzzling question.

Please be aware that

I am reporting on the basis of an experiment that was performed only one time. The SPAWAR researchers, on the other hand, performed numerous experiments, used several different instruments and published several articles in refereed journals in the last decade. At least two of them are recognized authorities in the field of electrochemistry.

We are amateurs in comparison. But we feel that the method of analysis of our CR-39 results is valuable. It might help to deal the basic issue of ”nuclear versus not nuclear” origin of CR-39 pits.

Final comments

- It is possible to wrap CR-39 detectors into foils that are thick enough to prevent chemical corrosion but thin enough to transmit alpha particles and protons.
- Such experiments are now in progress, in several laboratories. Results will probably be known in a month or two. Then one will be in a better position to decide whether or not a nuclear process is responsible for large pits on CR-39.
- For the time being the issue should be considered unresolved. It is conceivable that large pits will disappear while small pits will remain. That would be consistent with nuclear origin of some pits.