Electrodeposition Experiments planned @ TASCA

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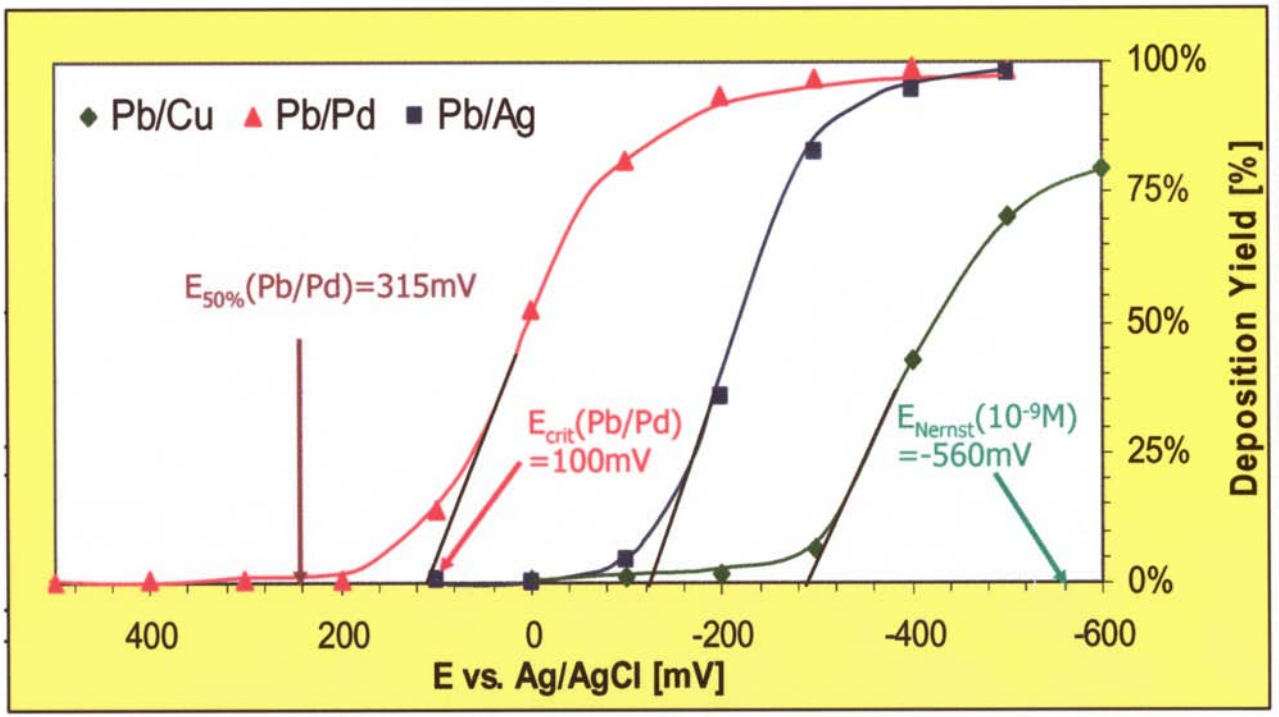
Determination of Critical Potentials



Deposition of ^{212}Pb on Pd, Ag and Cu from 0.1 M $HClO_4$. Electrolyte Volume V=1mL, Electrode Area A=1cm², stirring at 600rpm. The tangents show the E_{crit} values.

The Velocity of Deposition

$$\frac{dN_{dep}}{dt} = \frac{DF_E}{\delta V}(kN_{tot} - N_{dep})$$

F. Joliot, J. Chim. Phys. **27,** 119 (1930)

k = maximum fraction deposited, becomes 1 for a sufficiently negative potential

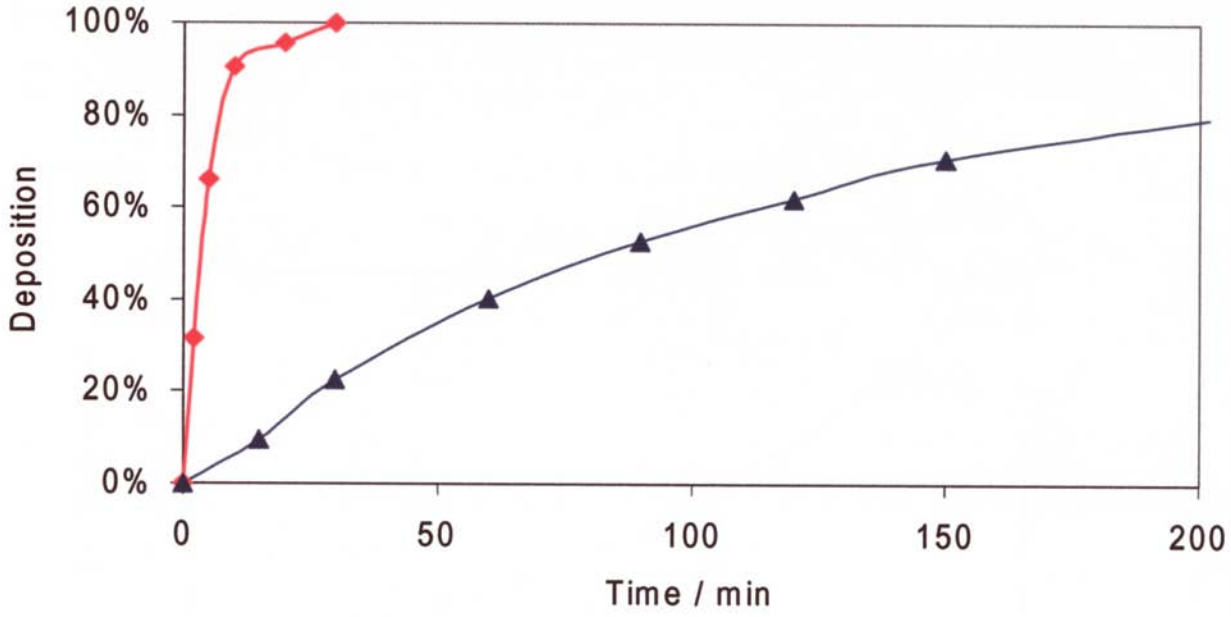
V = volume of electrolyte

FE = area of electrode

D = diffusion coefficient

δ = Nernst diffusion layer

Influence of the V/FE ratio on the Velocity of Deposition

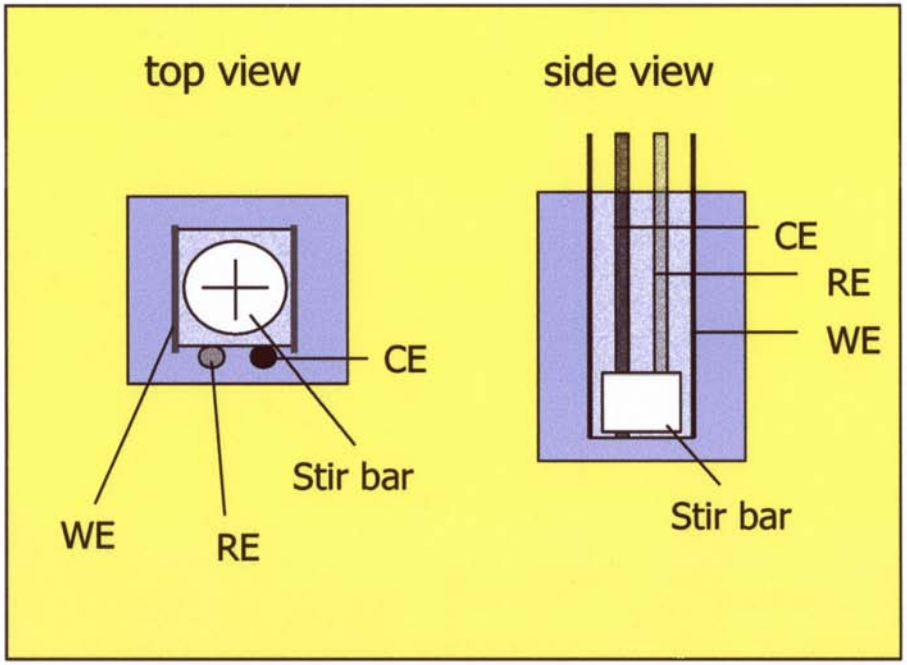


V = 20 ml, FE = 2 cm², V/FE= 10 ml/cm²

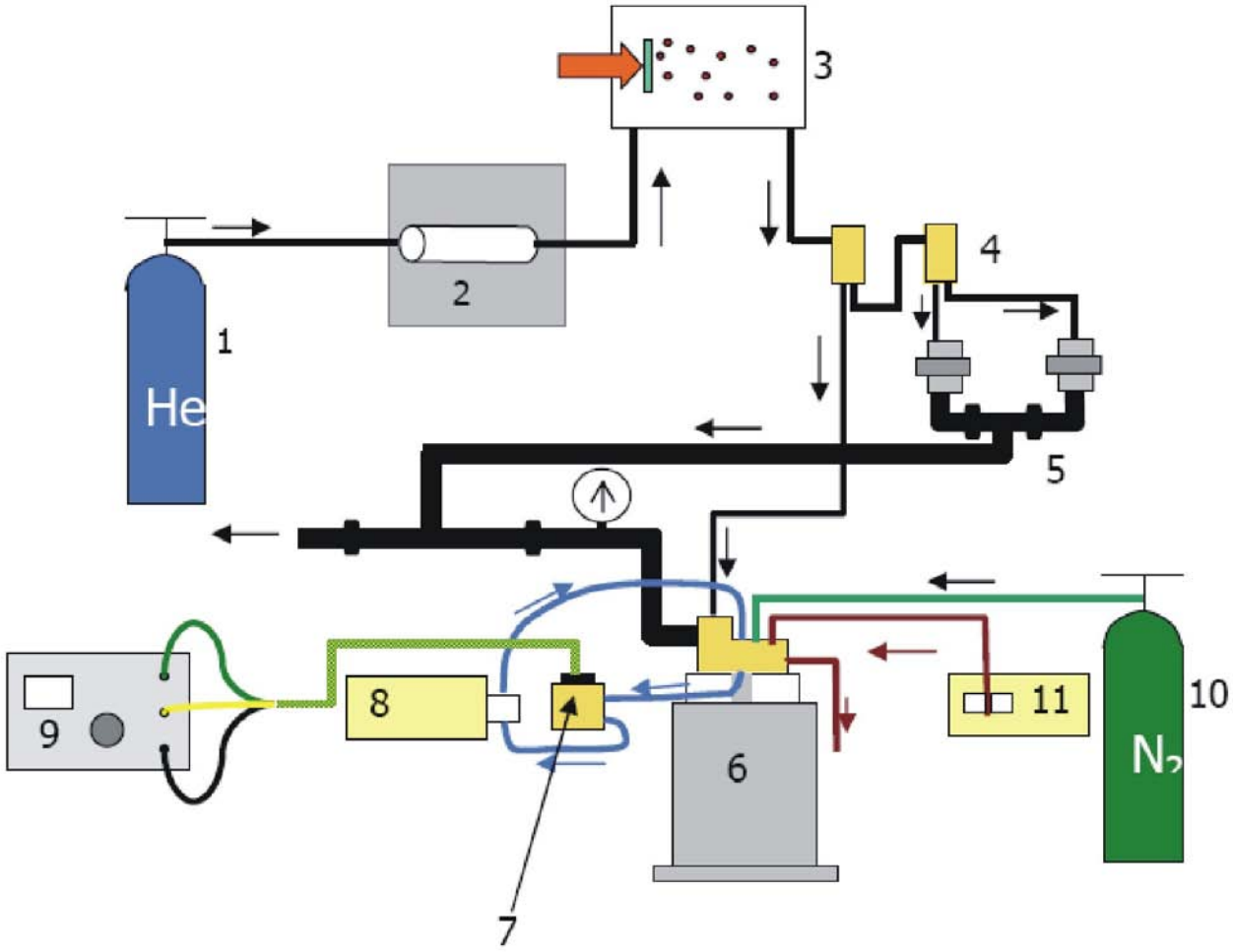
V = 0,15 ml, FE = 0,36 cm², V/FE = 0,42 ml/cm²

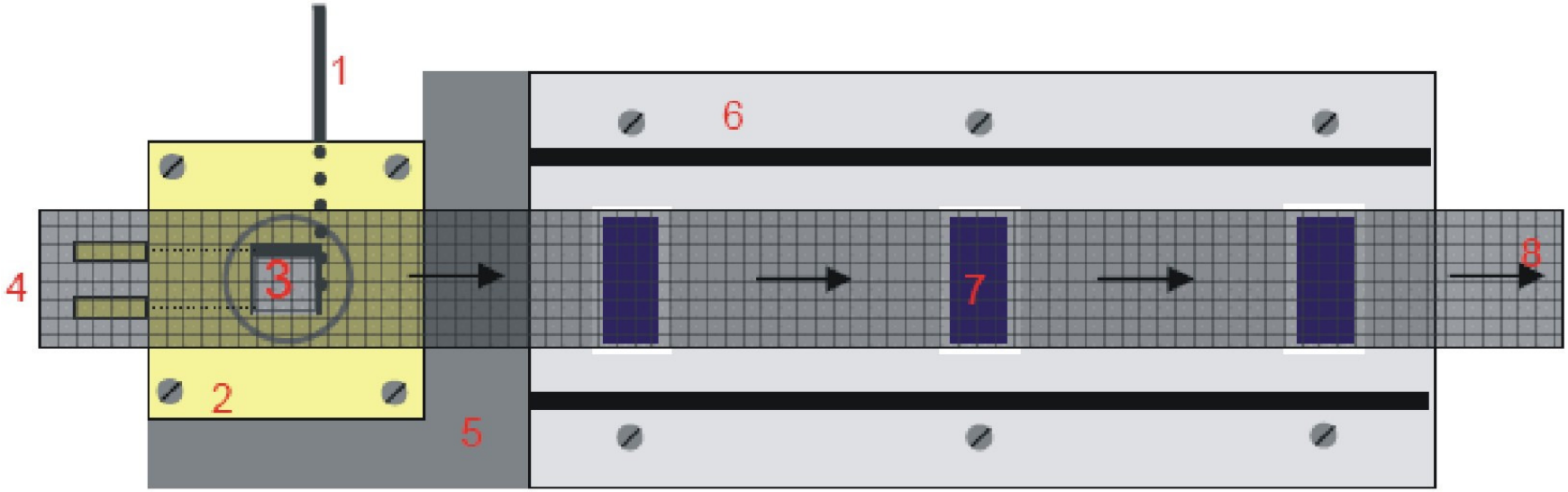
→ Factor 24

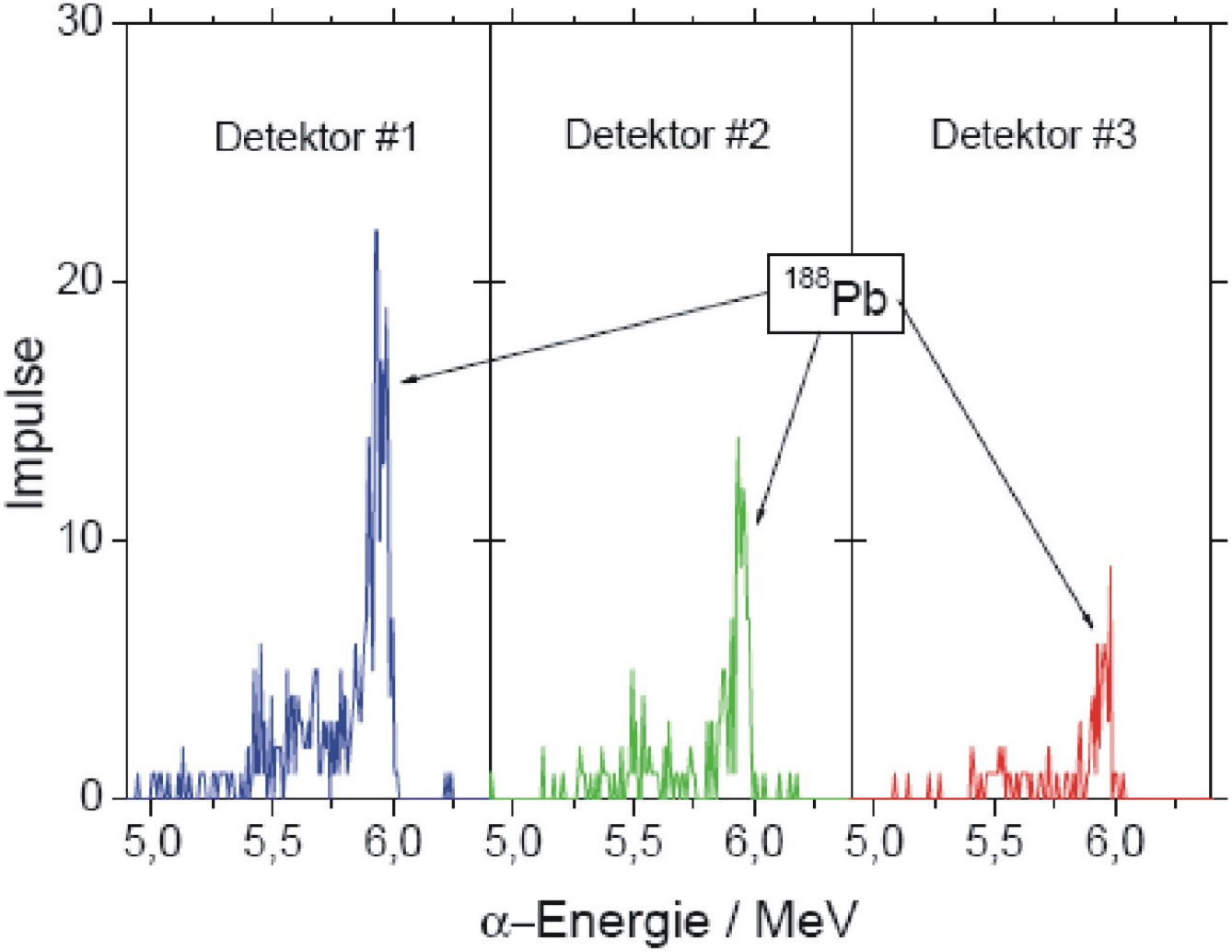
Fast Electrodeposition Cell

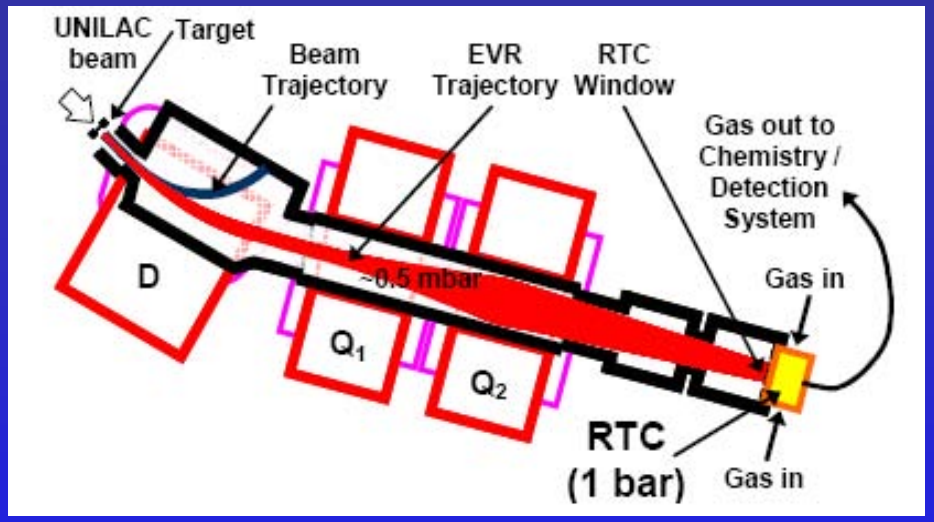


$t_{50\%}$ = 5s for the deposition of Pb on Pd from 0.1M $HClO_4$,
A = 2cm² and V = 400µl at 90°.
Stirring with high volume magnetic stirrer at 1400rpm.


3
2
1
He
4
5
9
8
7
6
11
10
N₂

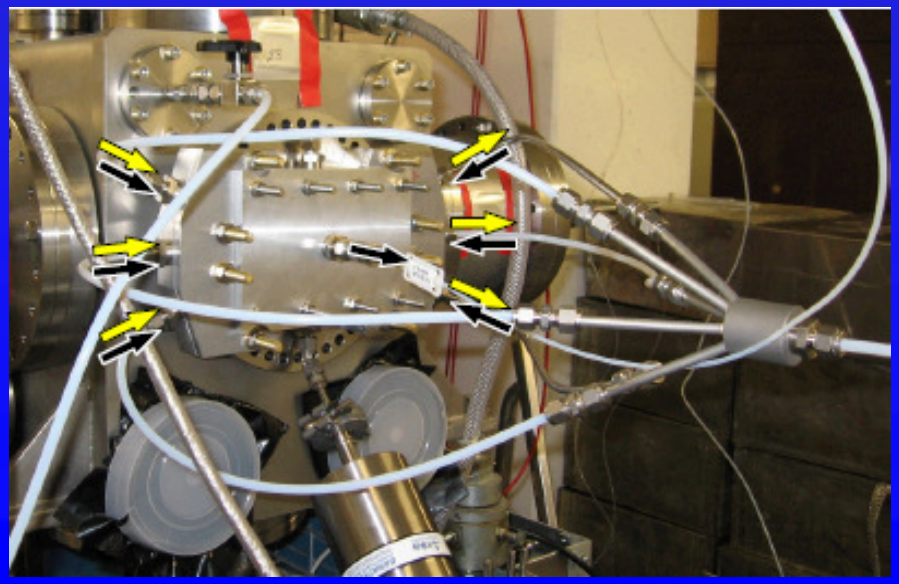

1
2
3
4
5
6
7
8

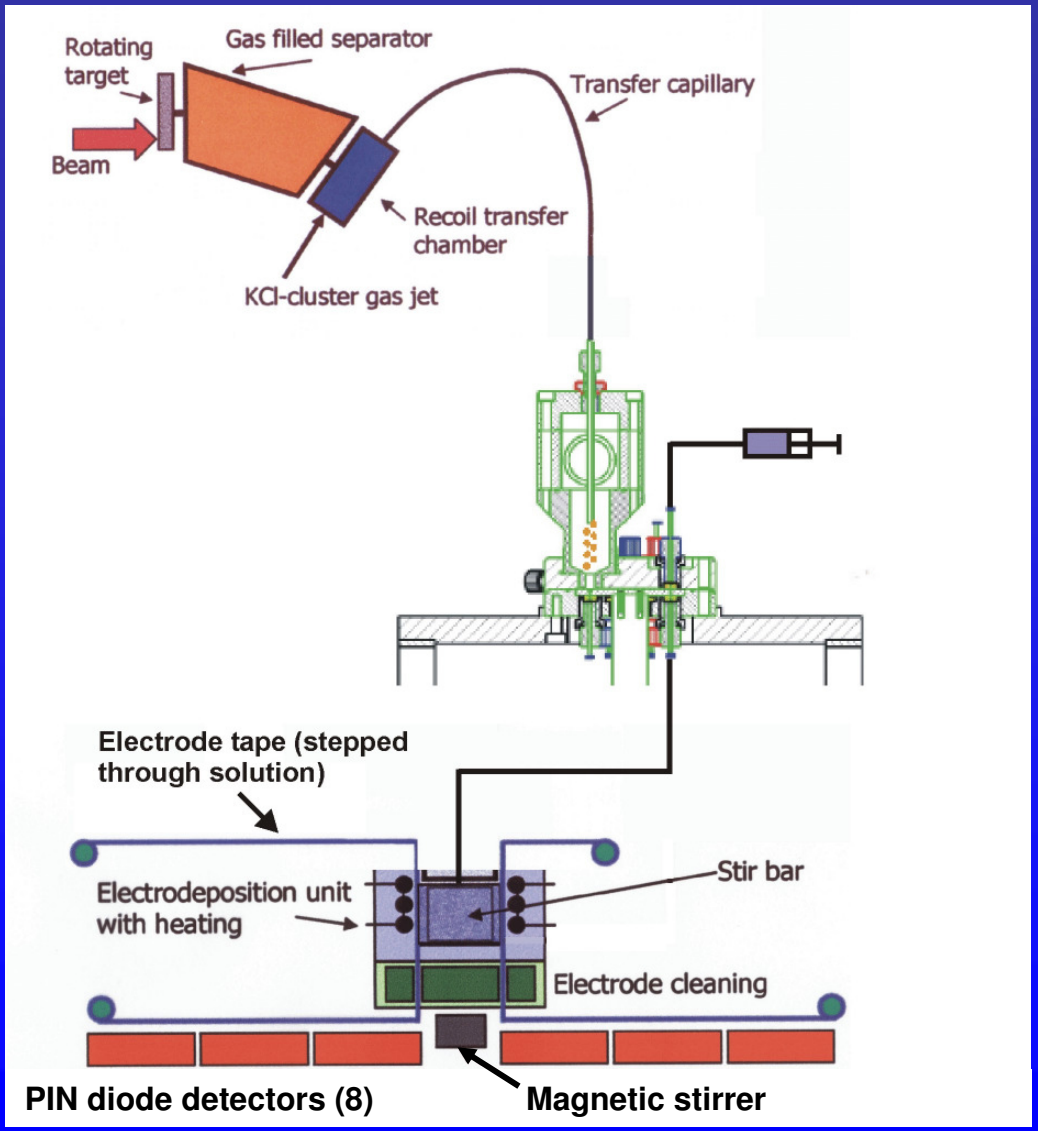

Detektor #1
Detektor #2
Detektor #3
^{188}Pb
Impulse
30
20
10
0
5,0
5,5
6,0
α–Energie / MeV



TASCA in the preseparator configuration

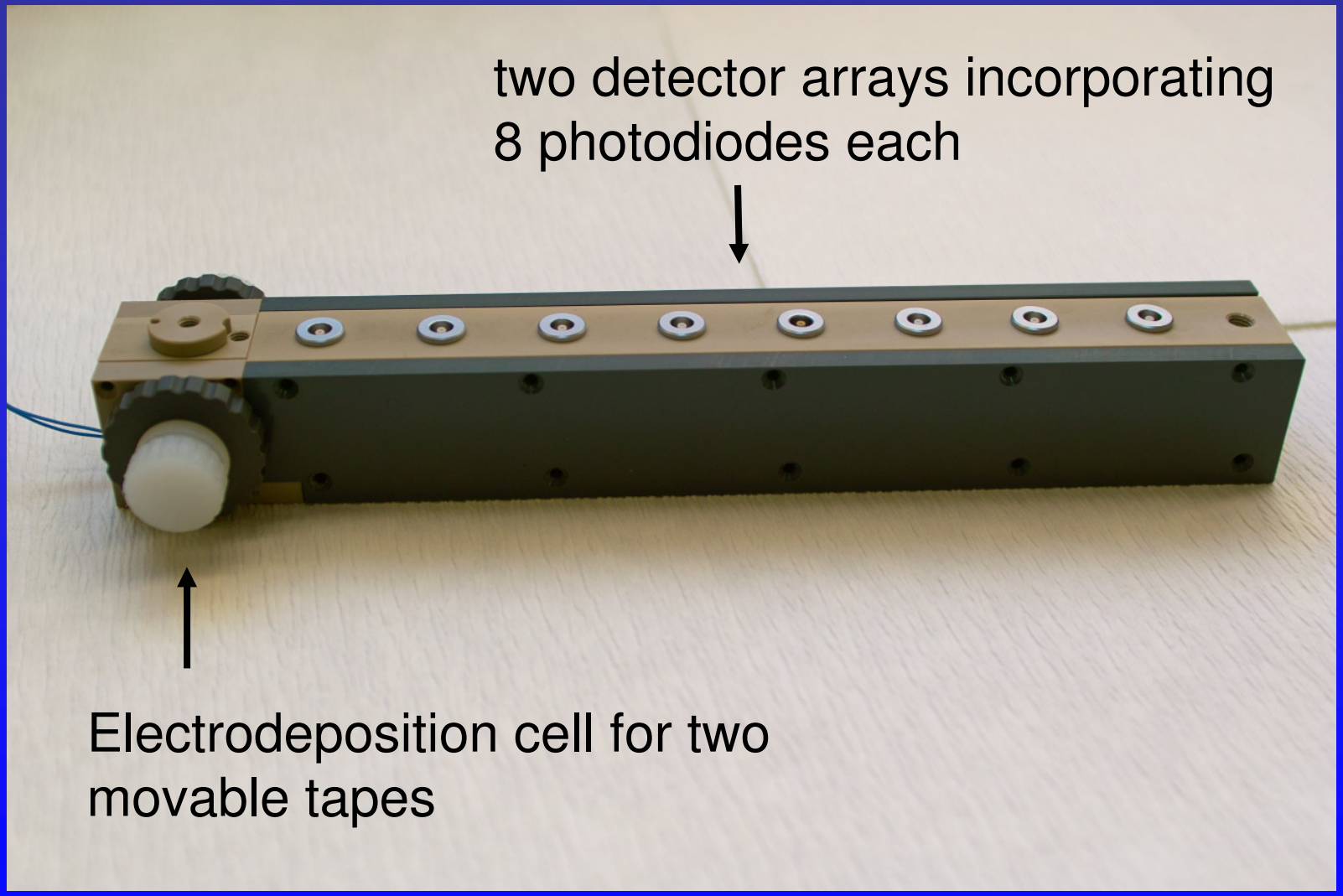
The HTM RTC mounted @TASCA.
The two gas – flow regimes are indicated by light and dark arrows.

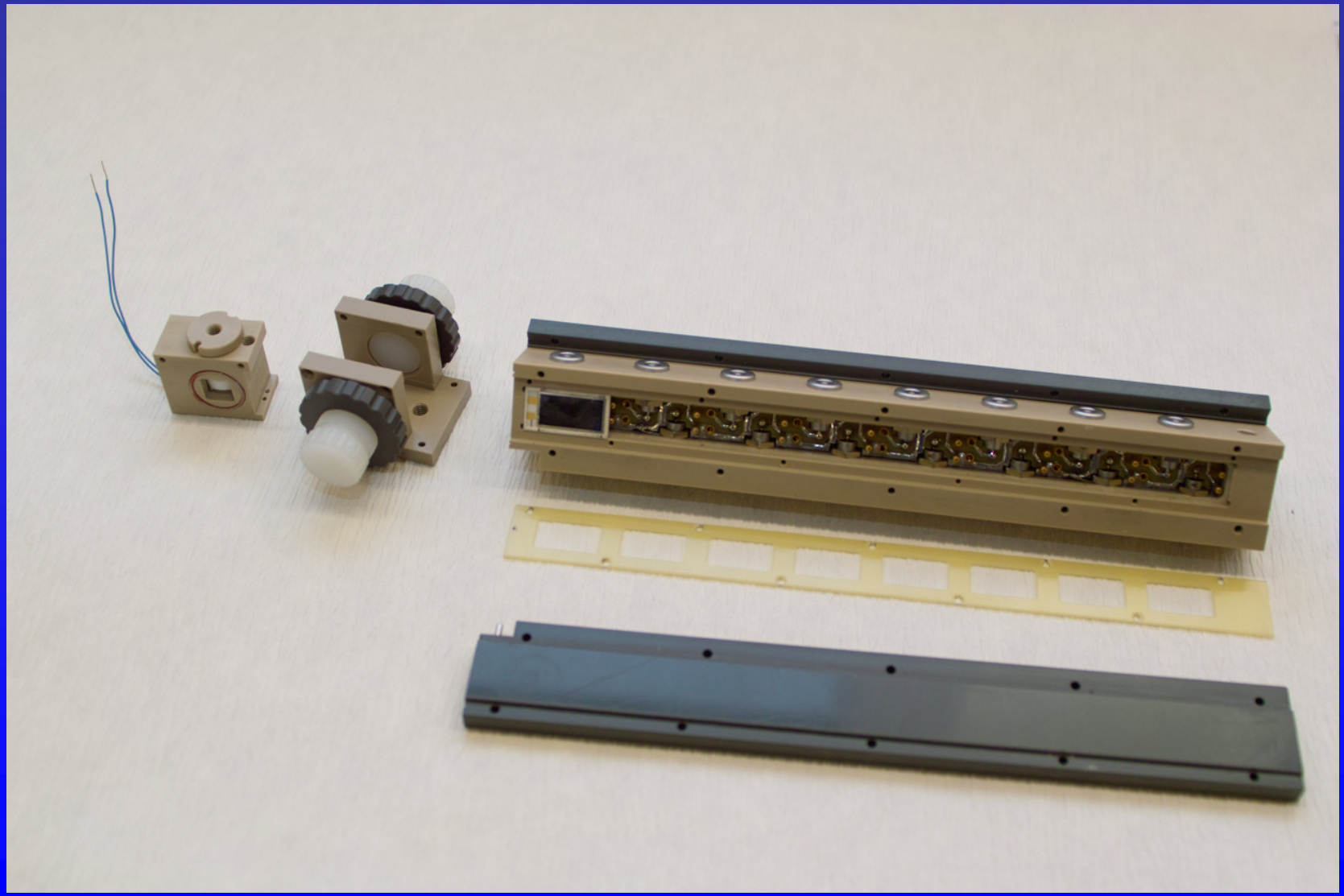


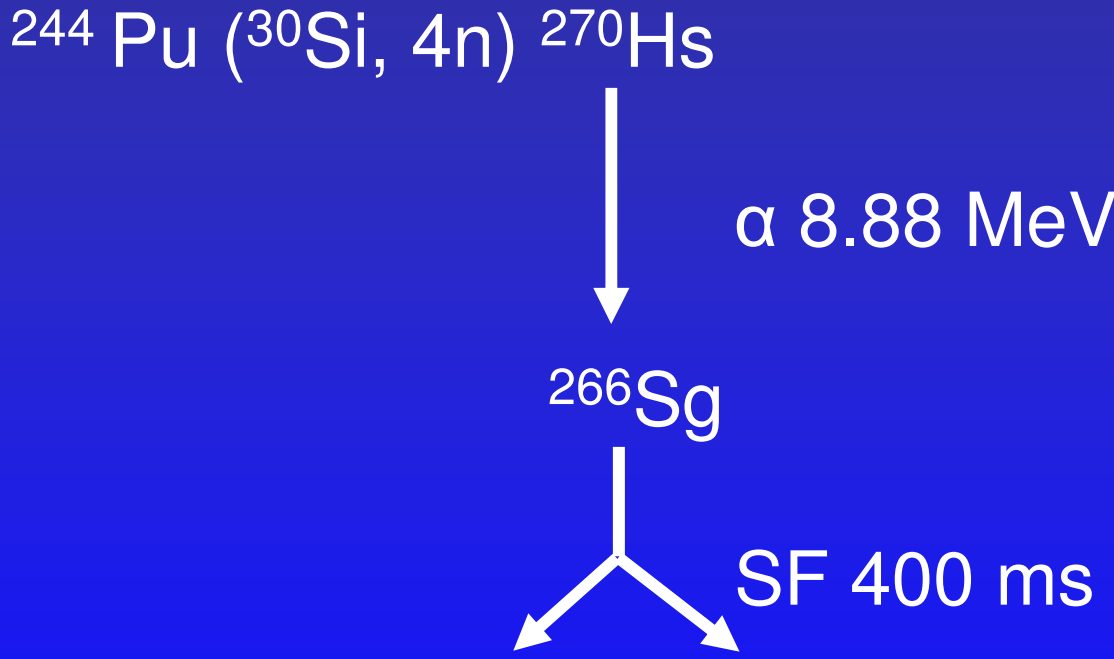


Coupling scheme of

TASCA – RTC – ALOHA – ELECTRODEPOSITION with two electrode tapes and two detector arrays


two detector arrays incorporating
8 photodiodes each
Electrodeposition cell for two
movable tapes




^{244}Pu (^{30}Si, 4n) ^{270}Hs
α 8.88 MeV
^{266}Sg
SF 400 ms