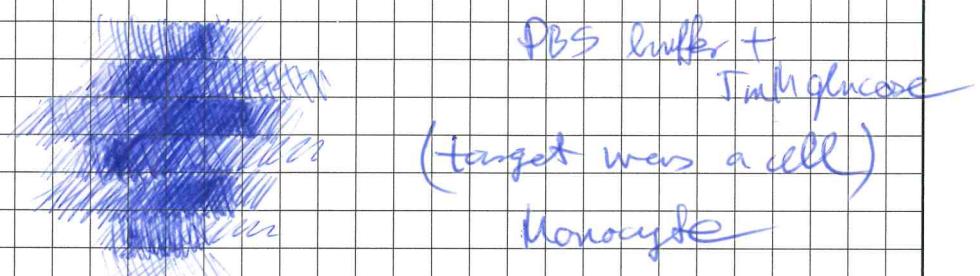


From Page No. _____

Book No. _____

This is an attempt to deconvolute an alod raster scan measured by Dr. Monika Dorem and Phillip Knapp on 2014.01.28. This is an anaglyphic metric raster scan, showing meander distortion.



$E = 670 \text{ mV}$ vs. Ag/AgCl
measuring H_2O_2

The data is in the format:

0 0.00E+00 1 1.23E-12
1 / |
2 / |
3 / |
4 / |
| |
↓ ↓
common separator x-coordinate in (m)! common separator
numerical measurement current in A

The data is not in chronological order!

This should be the correct one:

9
1
2
3
4
5
6
7
8
9 To Page No.

Witnessed and understood by me

Date

Invented by

Date

Recorded by

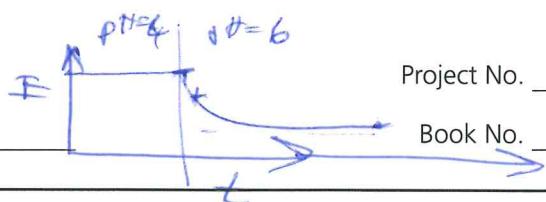
2018.06.14.

Project No. _____

Book No. _____

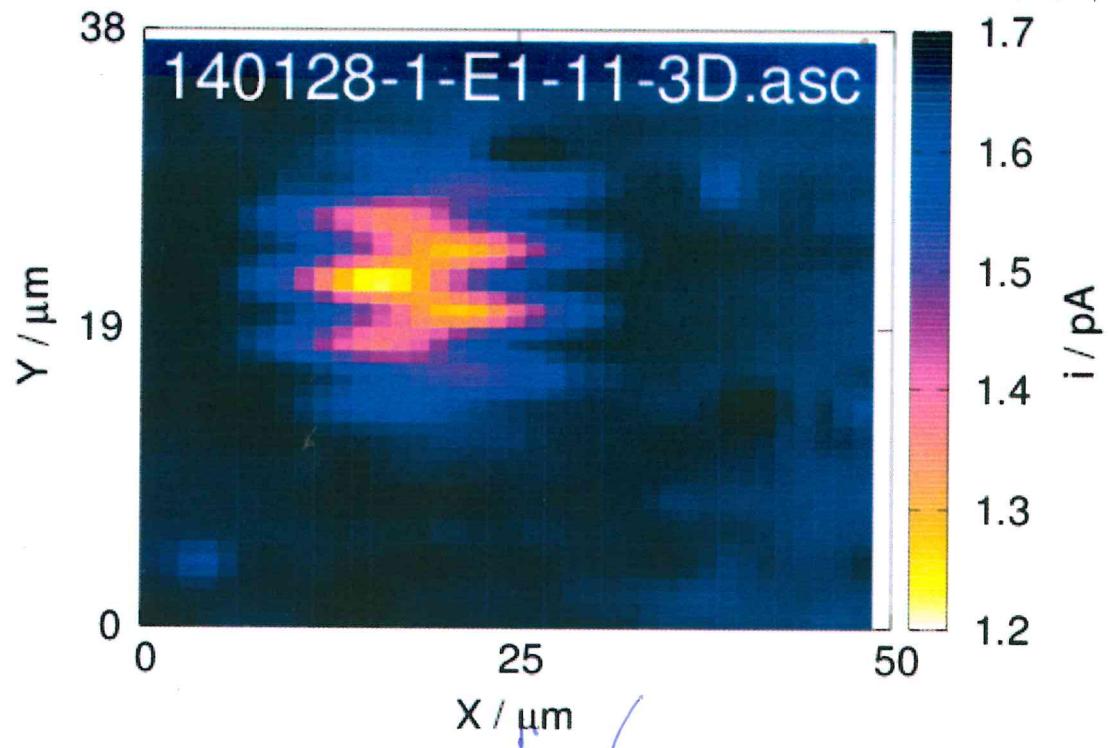
TITLE _____

From Page No. _____

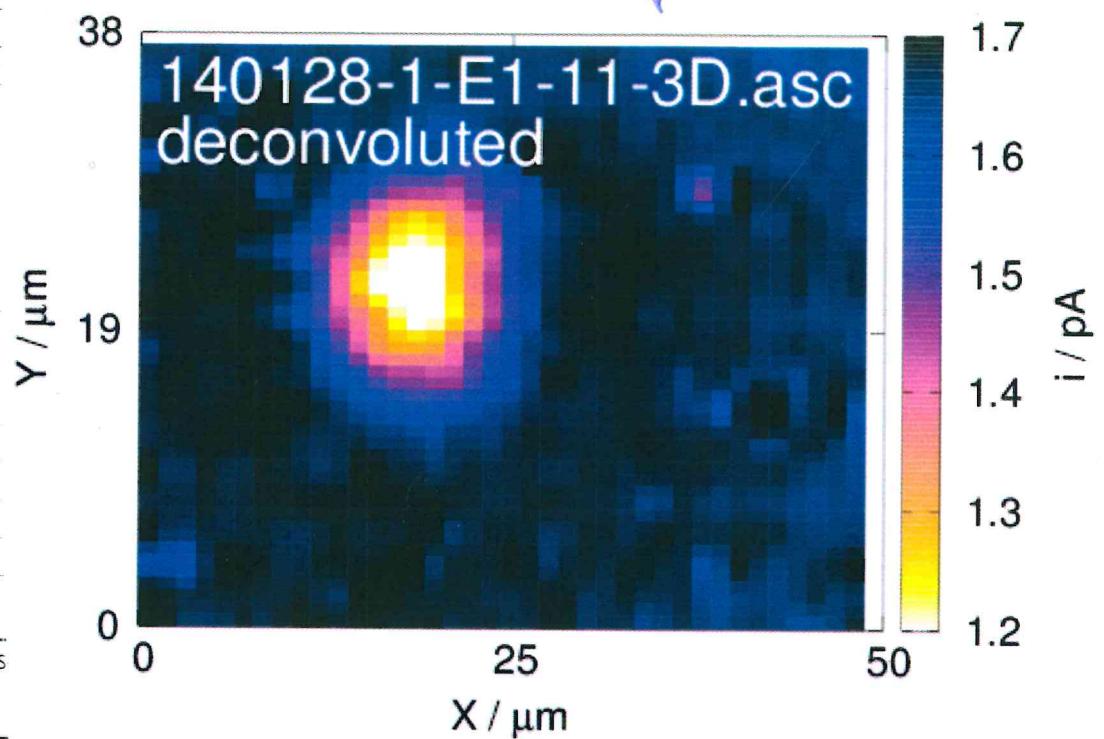


$$\frac{E_t}{E_0} = \left(\frac{E_0 - E_{t0}}{E_0} \right) e^{-\frac{t}{Rc}} + E_{t0}$$

$$E_t = E_{t0} + \left[\left(E_0 - E_{t0} \right) e^{-\frac{t}{Rc}} + E_{t0} \right]$$



$$\frac{t}{\pi} = 0.985$$



Color scheme in red palette right formulae 22, 13, -31

TITLE (Handwritten)

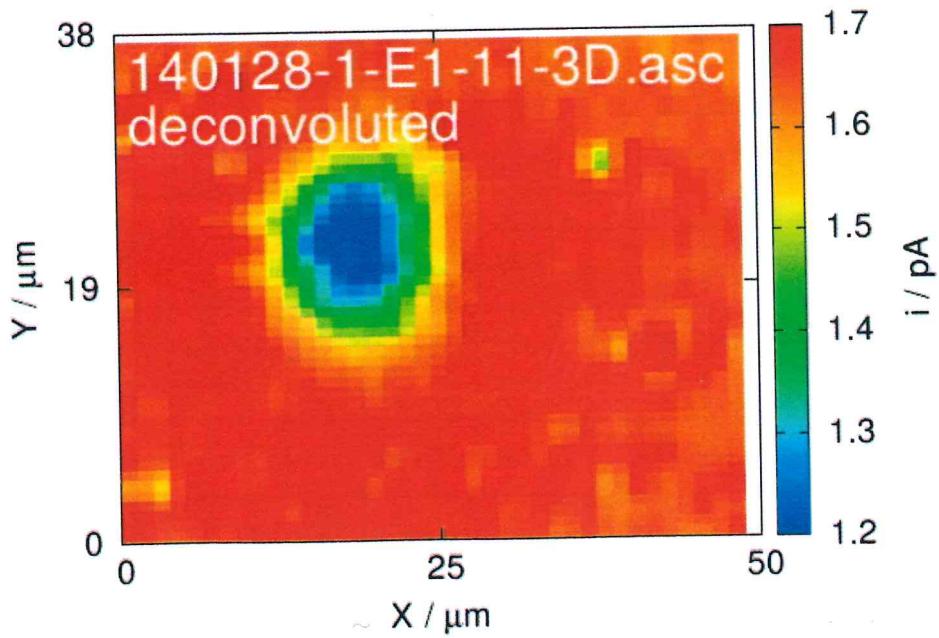
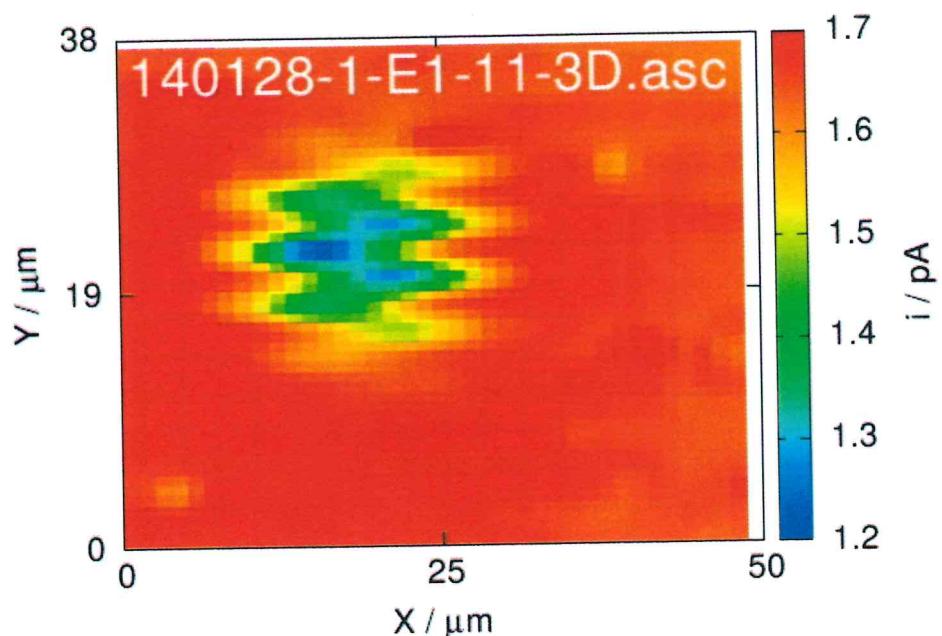
Project No. _____

Book No. _____

From Page No. _____

11. Nernst-equation

$$P_p = \frac{RT}{4\pi} \lg \frac{P_{O_2}}{P_{N_2}} [m^2] + \text{const.}$$



To Page No. _____

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Date

Invented by

Recorded by

Date

TITLE _____

Book No. _____

From Page No. _____

Labseminar 2018

(Biophysics)

Monday at 11.00

Auditorium CIPMM

Presentation

January, 8 th	-----	August, 6 th	Dalia
January, 15 th	Markus	August, 13 th	Girish
January, 22 nd	Leticia	August, 20 st	Diana
January, 29 th	Katerina	August, 27 th	Reinhard
February, 5 th	Bin	September, 3 rd	Janina
February, 12 th	no seminar	September, 10 th	Lea
February, 19 th	Kim	September, 17 th	Anni
February, 26 th	Arne	September, 24 th	Maylin
March, 5 th	Renping	October, 1 st	Lucas
March, 12 th	Eva	October, 8 th	Carsten
March, 19 th	Mona	October, 15 th	Nikolina
March, 26 th	no seminar	October, 22 nd	Monika
April, 9 th	Monika	October, 29 th	Michelle
April, 16 th	general points	November, 5 th	Phillip
April, 23 rd	Maik	November, 12 th	Adrian
April, 30 th	no seminar	November, 19 th	Julia
May, 7 th		November, 26 th	Sylvia
May, 14 th	Jie Zhu	December, 3 rd	Barbara N.
May, 28 th	Ewa J.	December, 10 th	
June, 4 th	Denise	December, 17 th	
June, 11 th	Remy		
June, 18 th	Vanessa		
June, 25.-Aug, 3.	no seminar		

To Page No. _____

Witnessed and understood by me

Date

Invented by

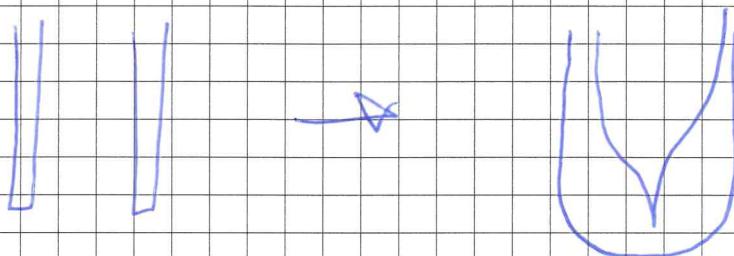
Date

Recorded by

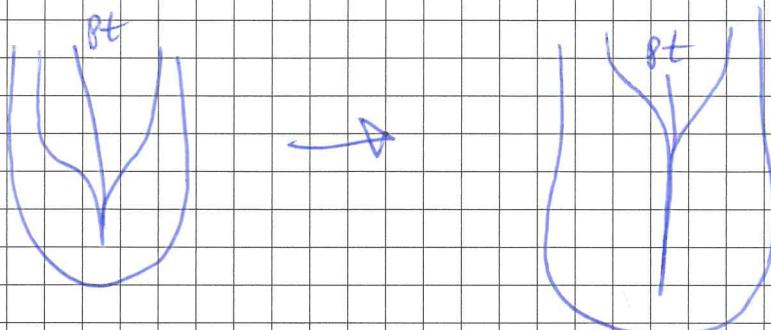
From Page No. _____

I wanted to show Marlon and Phillip how do we prepare the UMEs in recs.

First, we sealed a $d_o=2\text{mm}$ $d_i=1\text{mm}$ borosilicate capillary at one end:



Then, I put in the $R \approx 1\text{cm}$ $d=10\text{ }\mu\text{m}$ Pt wire, and seal it with a propane-butane burner:



Then, I push the solder into the capillary, close to the Pt wire. After that I melted it in the same flame

To Page No. _____

Witnessed and understood by me

Date

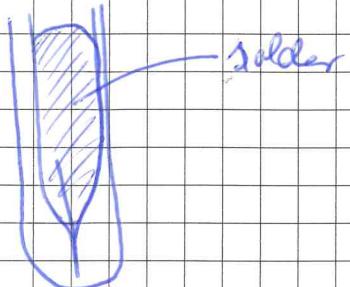
Invented by

Date

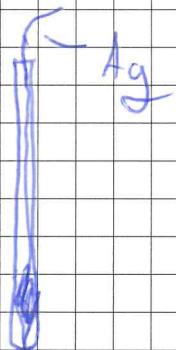
Recorded by

2018.06.20.

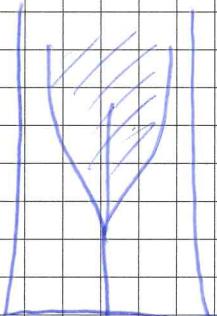
From Page No. _____



Then, while the solder was still molten,
I pushed in an 0.78 cm silver wire
to provide electric connection to the poten-
tialstat



Then, I ground the sealed end to
expose the Pt-wire.



To Page No. _____

Witnessed and understood by me

Date

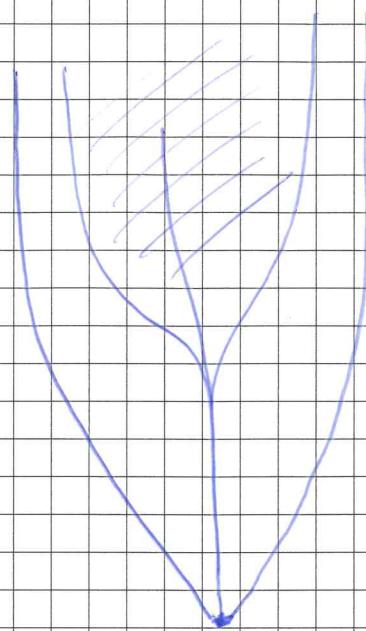
Invented by

Date

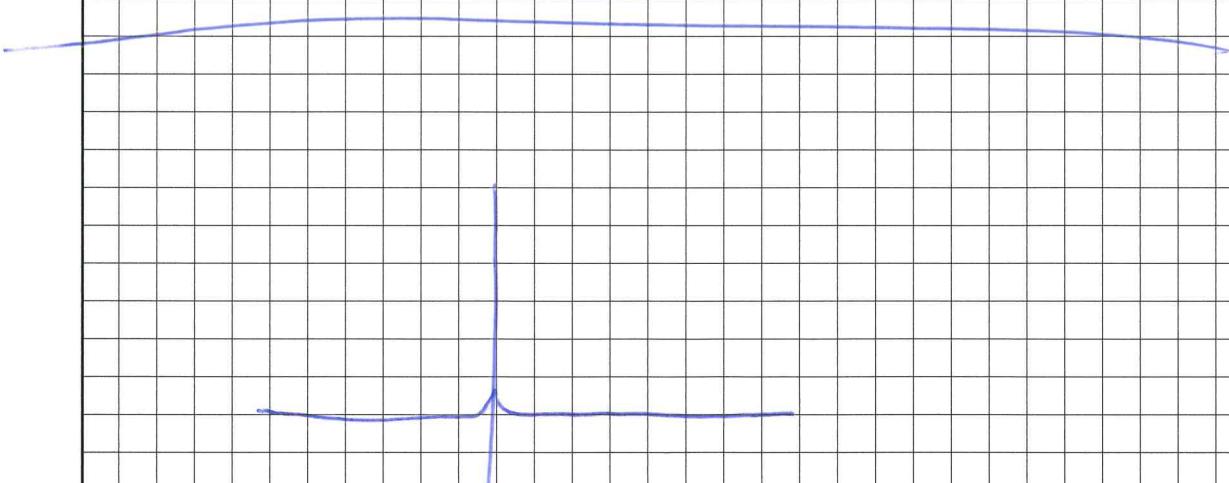
Recorded by

From Page No. _____

Then, I ground the benzene:



Tested with CV in 2mM ferrocene / 100mM KCl.



To Page No. _____

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Date

Invented by

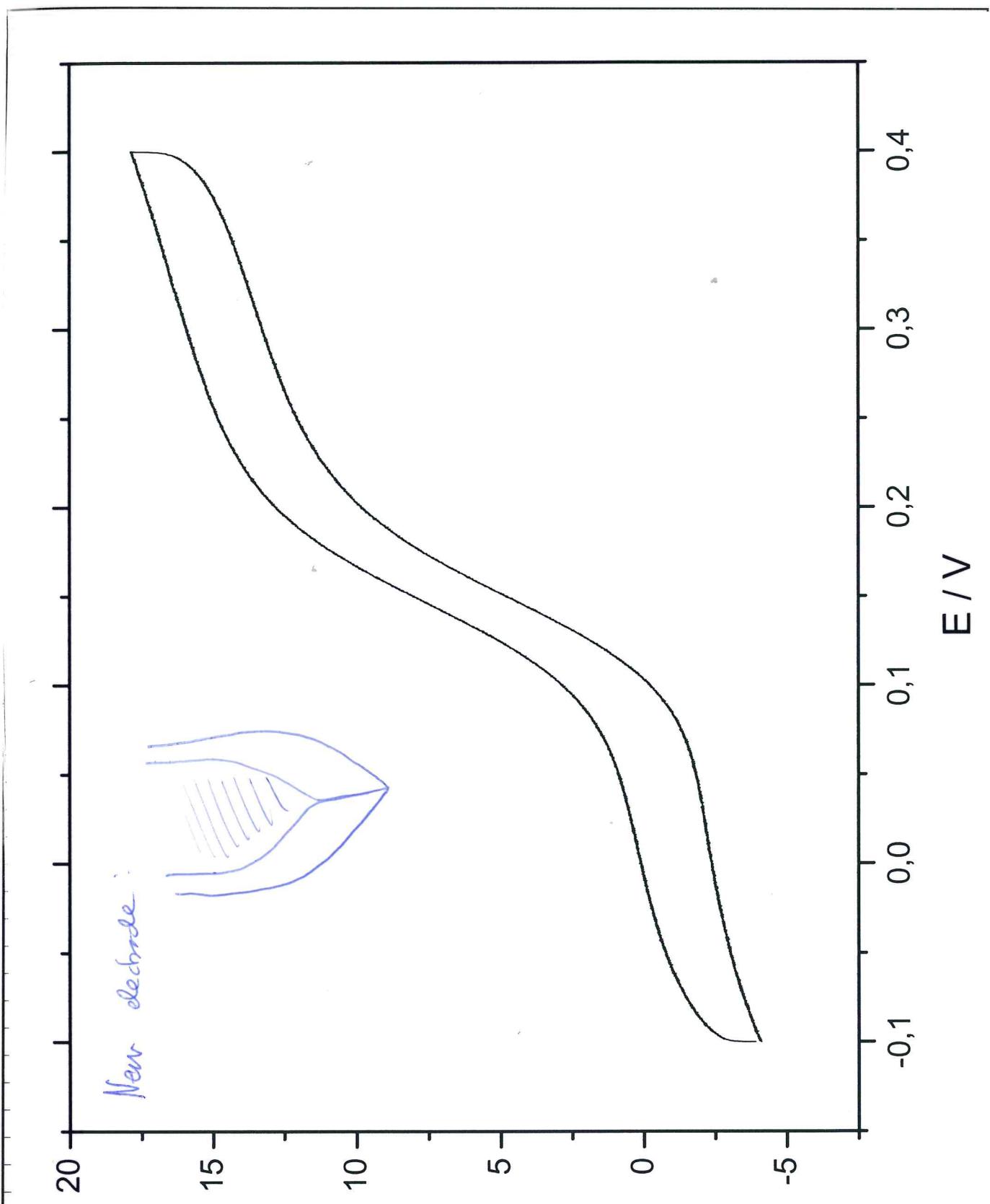
Date

Recorded by

Project No. _____

TITLE _____

Book No. _____



A / D

10 Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE H_2O_2 chronoamperometric calibration

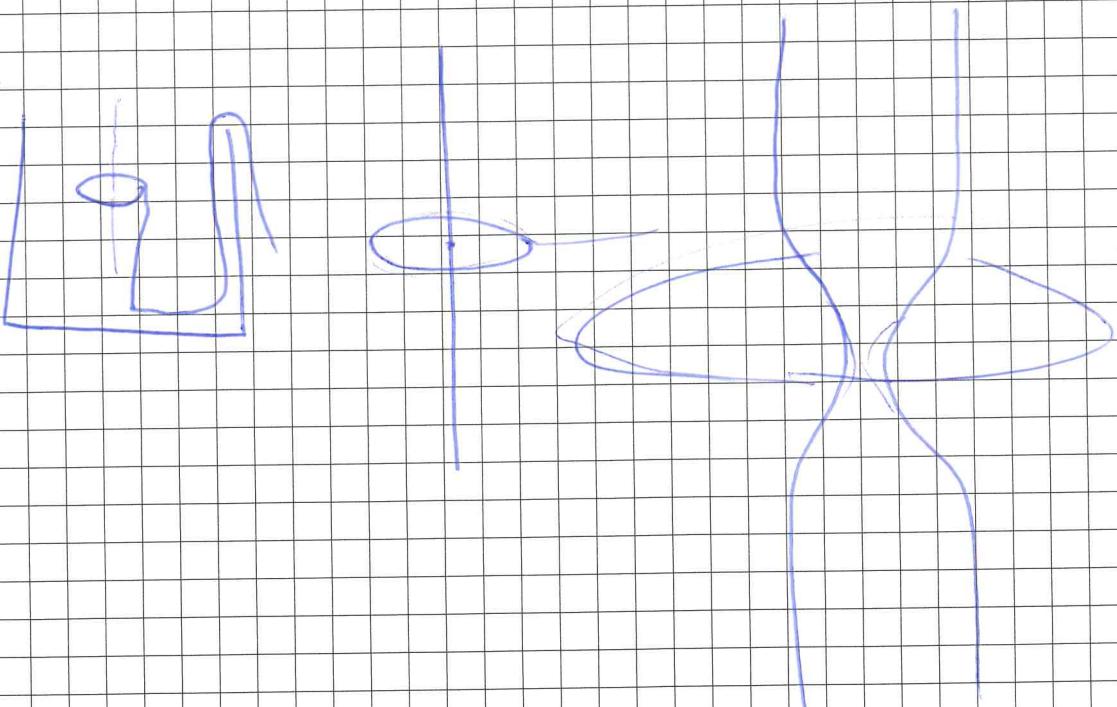
From Page No. _____

With the new electrode.

10-100 µl 1mM H_2O_2 stock
2 ml 10mM PBS

increase in H_2O_2 : 5 µM each addition

24.5°C

 H_2O_2 stock solution prepared by Phillips

To Page No. _____

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Invented by

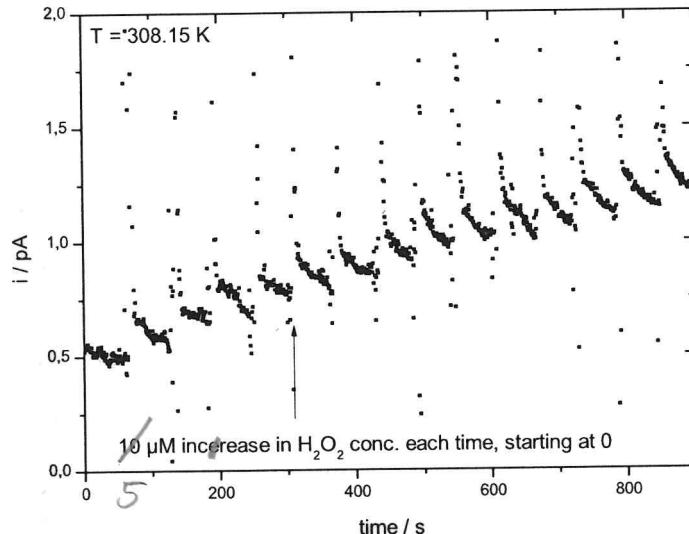
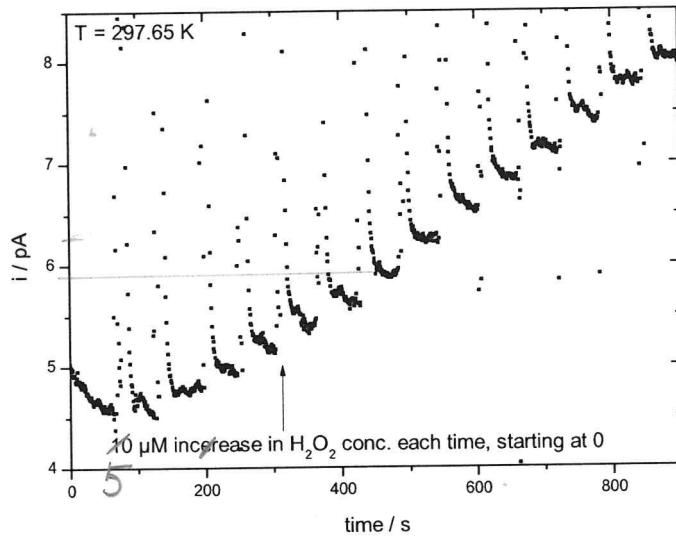
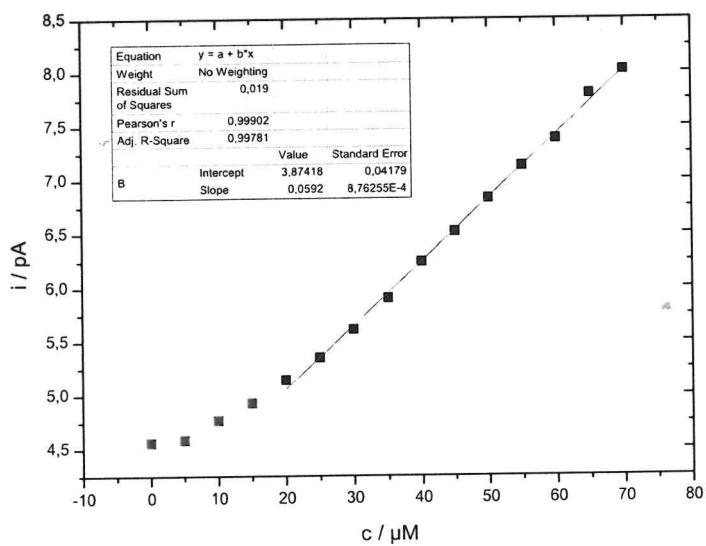
Date

Recorded by

TITLE _____

Book No. _____

From Page No. _____



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

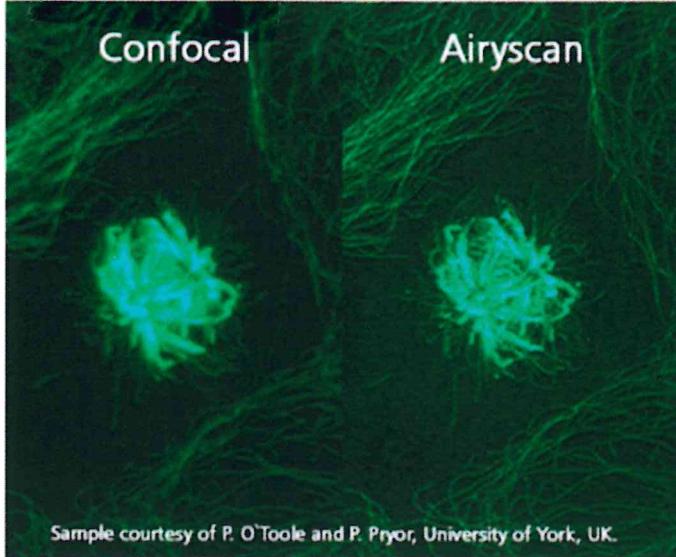
Recorded by

Project No. _____

TITLE Zein Warkany

Book No. _____

From Page No. _____



ZEISS Airyscan is revolutionizing confocal imaging.



Download the free white paper to learn how this new detector concept for confocal provides higher signal-to-noise, less bleaching, faster imaging and super resolution with any fluorophore.

140514-1.dat

① 6

E1-1, maybe

beads

(E1-3)

To Page No. _____

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Date

Invented by

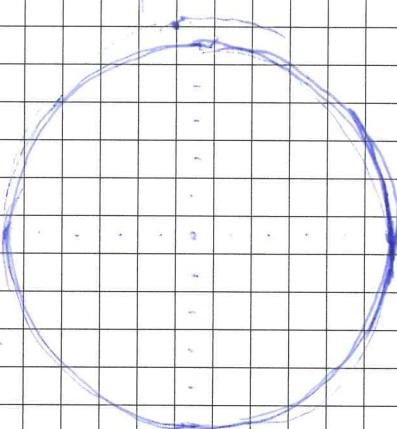
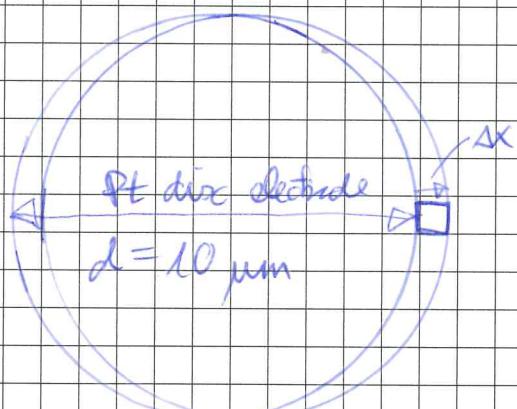
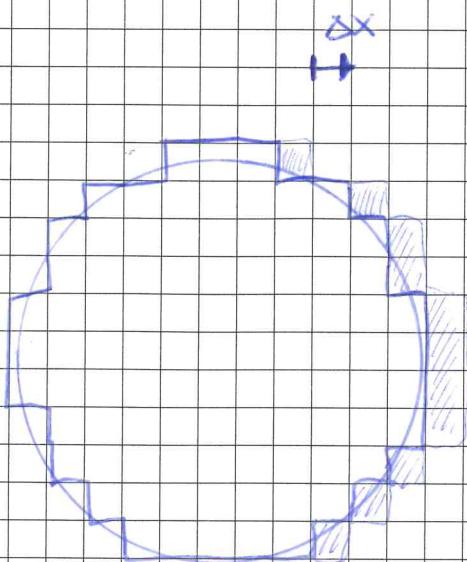
Date

Recorded by

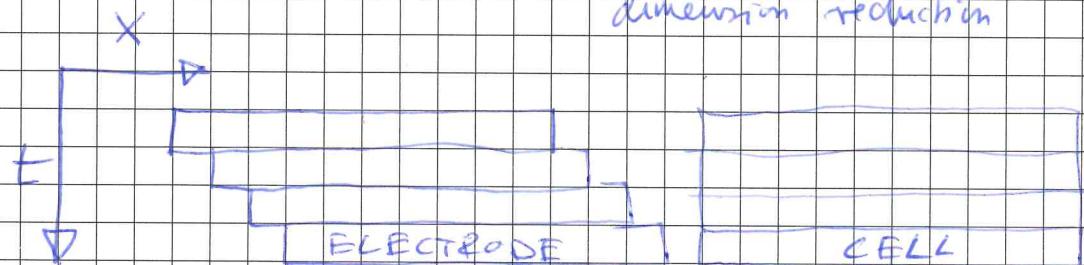
TITLE _____

Book No. _____

From Page No. _____



↓ Simplification
dimension reduction



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE 140514-1.dat

Book No. _____

From Page No. _____

E1-7

45 $\mu\text{m} \times 45 \mu\text{m}$ 2 $\mu\text{m}/\text{s}$ $\mu\text{m step} : 2 \mu\text{m}$

26 scanlines

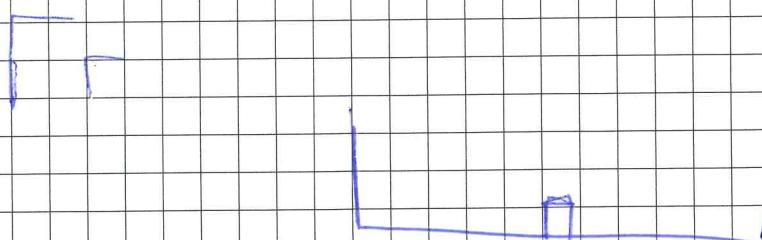
x: 0 - 45 (401 row)

y:

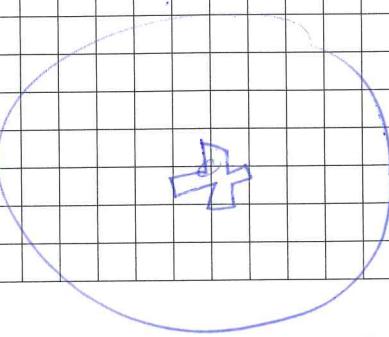
Lines in the file: 13026

$$\frac{13026}{466} = 26$$

1301

TO
401 45 $\mu\text{m} \times 45 \mu\text{m}$ 

0.9



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE _____

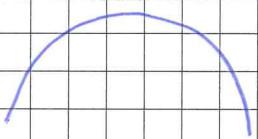
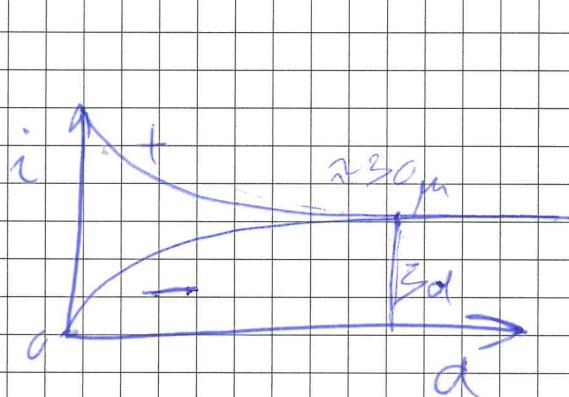
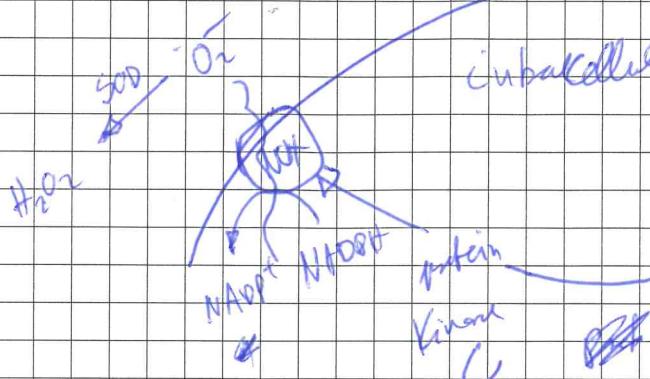
Book No. _____

From Page No. _____

M1

18626-1.dat

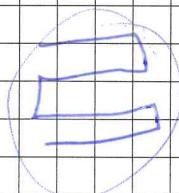
exha

TPA
or
PFA

cell attached to UVE and dragged along during the scan

E1-11-4

0.5 mM TPA
+ 5 μ l to 2 ml



1 μ M TPA for the cells
in DMSO

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

From Page No. _____

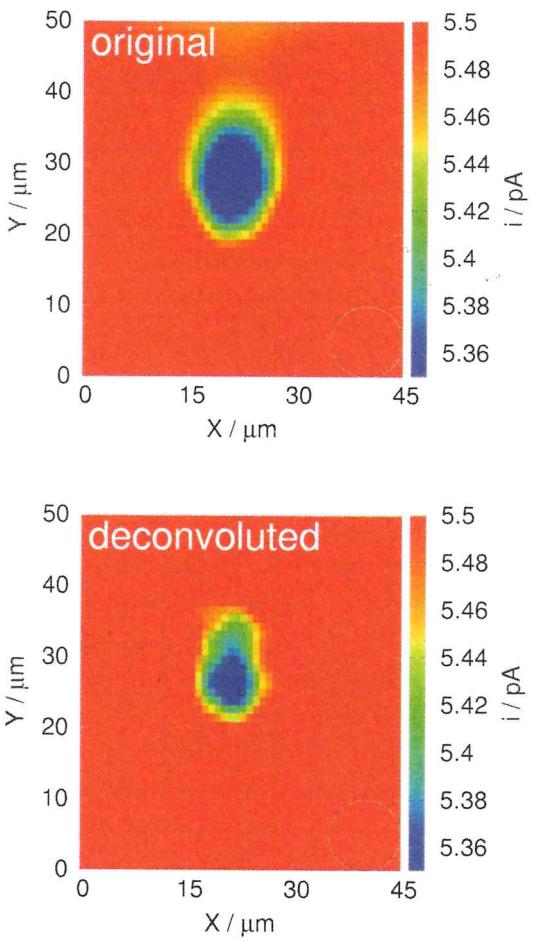


Figure 1

Witnessed and understood by me

Date



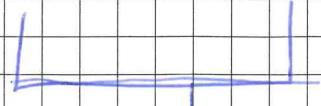
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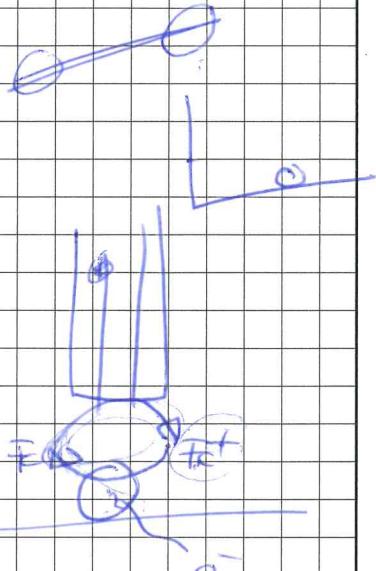
TITLE 180627 New cell experiment

From Page No. _____

1, Wash cell culture 2ml PBS



fibronectin
+
cells



Put 2ml PBS in

2, Place electrodes

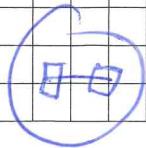
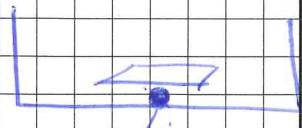
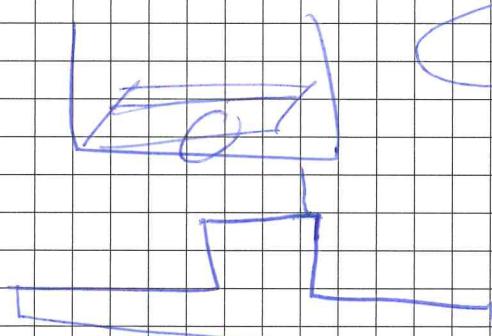
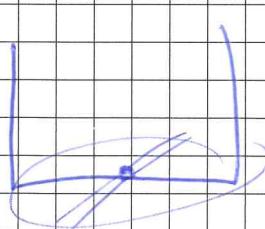
3, Load her cells (Jouyshik mode)

4, Set origin

5, clean electrode 970 μ mV ($\pm 70 \mu$ V)

for Pan records

1mM TPA



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

target
Pt wire measurements for
spectral deconvolution

From Page No. _____

3: meander
4: fast comb

10 $\mu\text{m/s}$ 200 mV 5 mV/ μA

10 $\mu\text{m} \times 50 \mu\text{m}$

1 $\mu\text{m} \times 1 \mu\text{m}$ step size

51 \times 51 μm^2 0 - 50

5:



5 $\mu\text{m/s}$

meander

6:

best set for
2 electrode

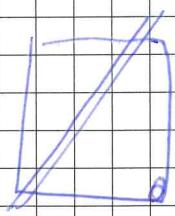
5 $\mu\text{m/s}$

51 \times 51

7:

even better

$\Delta t = 5 \mu\text{m}$



start photo: 007

8:

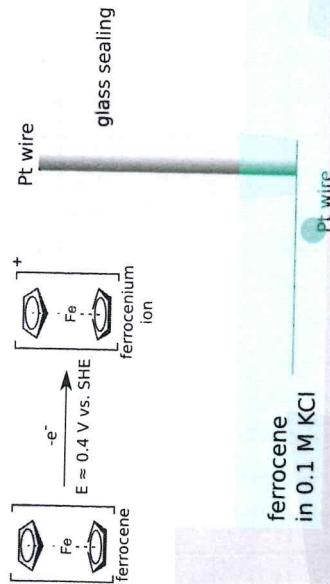


electrode focus: 5.88 μm
wire edge focus: -3.82 μm

ϕ 20 μm Pt

start: 010

stop: 011



To Page No. _____

Witnessed and understood by me

Date

180627

Invented by

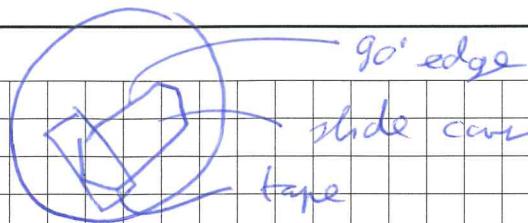
Recorded by

Date

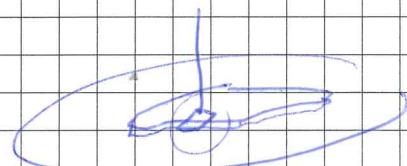
TITLE Image of broken microscope slide cover Book No. _____

From Page No. _____

ZnM ferrocene in 0.1M KCl



E1-2 - 50x70 $\mu\text{m} \times \mu\text{m}$
 $1\mu\text{m} \times 1\mu\text{m}$



E1-3 -
 fast comb

E1-4 -
 fast comb $5\mu\text{m}/\text{s}$ start end picture: 004

E1-5 -
 meander
 $50\mu\text{m}/\text{s}$

E1-6 -
 meander
 $100\mu\text{m}/\text{s}$

m. f.c.
 2.1 15 16 ✓
 5 3 ✓ 4 17 ✓
 10 2 19 ✓ 3 18 ✓
 20 5 10 ✓
 100 6

E1-13: finish: 076

E1-17: finish: 8

E1-32: finish 13

$5\mu\text{m}/\text{s}$
 101×101

 $1\mu\text{m} \times 1\mu\text{m}$ res.

E1-33: finish 14

~~40x101~~ To Page No. _____
 201

Witnessed and understood by me

Date

Invented by

1x1

Date

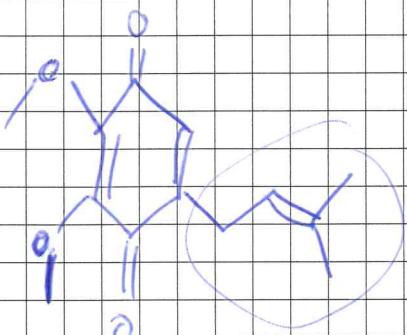
180628

Recorded by

From Page No. _____

Ca^{2+} affinity of decylubiquinone in organic solvents

(Valentin Mirceski (SMM)
Lovic was his supervisor)

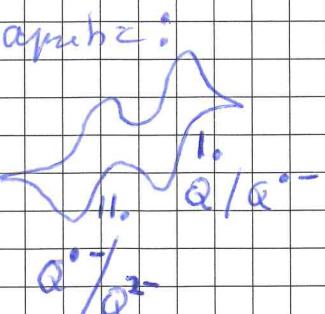
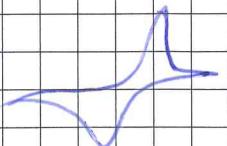
Coenzyme Q₁

decylubiquinone

Coenzyme Q₁₀

apotic \rightarrow non-proton donating solvent

apotic solvent:



- molar: SVV \rightarrow SVV
- activity instead of conc.
temp?

To Page No. _____

Witnessed and understood by me

Date

Invented by

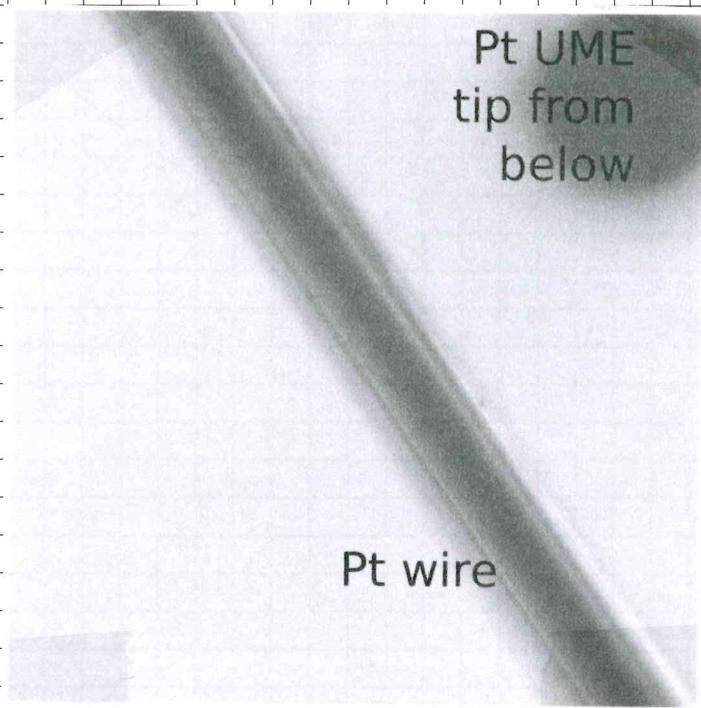
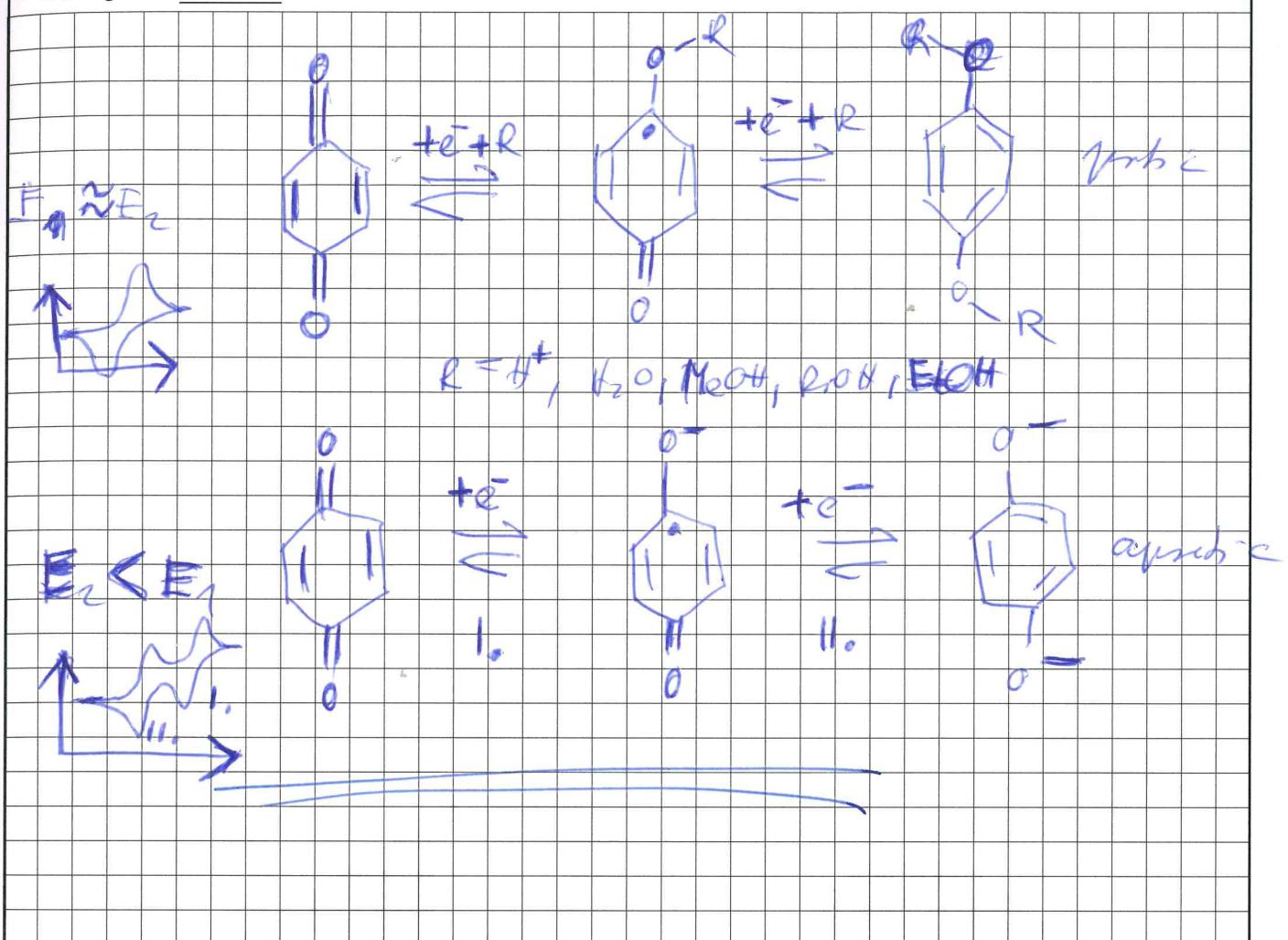
Date

Recorded by

TITLE _____

Book No. _____

From Page No. _____



referred to on
page 19

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE _____

Book No. _____

From Page No. _____

'32_xyz_separated_lines.txt'

current is out of range!

*i/pA*200
190
180
170
160
150
140
130
120
110
100

0 20 40 60 80 1000

100

80

60

40

20

*y / μm**x / μm*

All of the scans from 180628 are
clipped at ~200 pA!

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

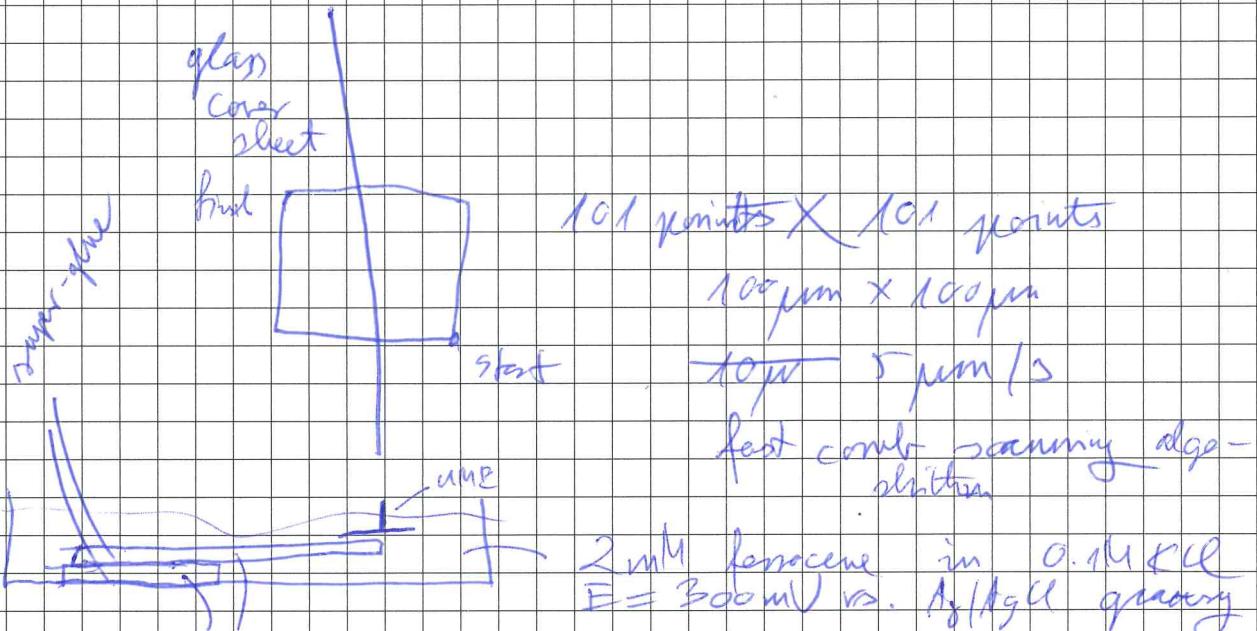
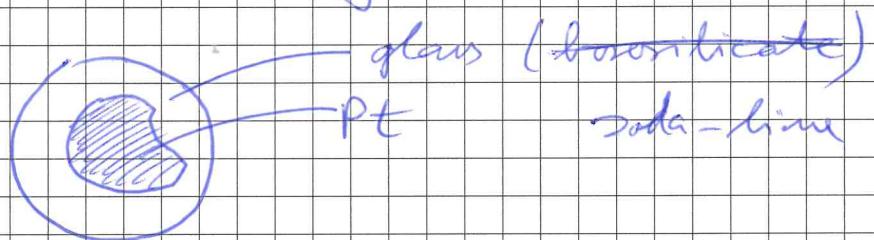
Recorded by

TITLE Soda-lime glass pulling

From Page No. _____

Sutter Instrument P-1000

Program 88

180704. Scanning with electrode #8 prepared
yesterday $h = 100 \mu\text{m}$ glass cover sheetsgain : 20 mV/pA

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

Continued on next page

TITLE _____

From Page No. _____

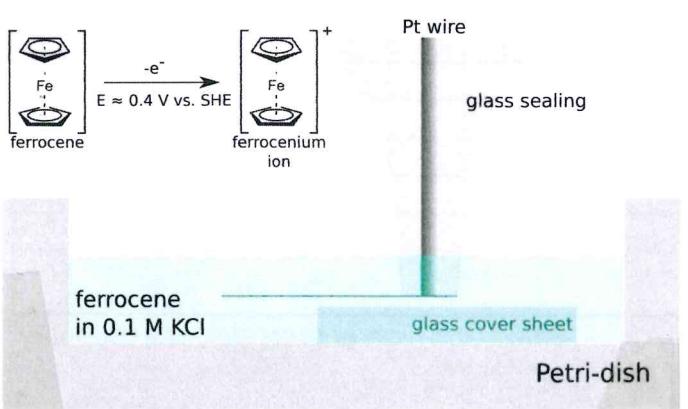
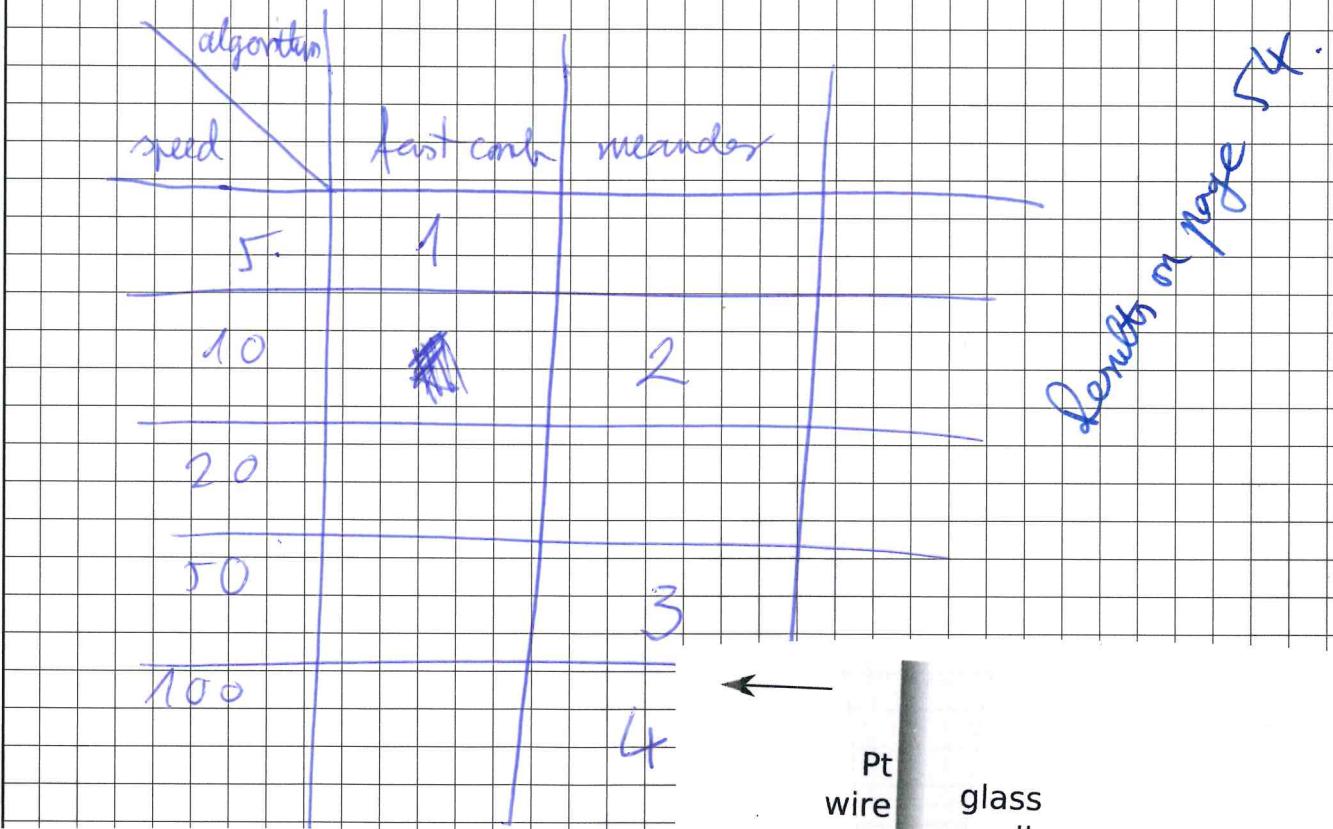
Continued from previous page

- 180704/E1-1

joints: cell 180704-003, TIF

 101×101
 10×10 5 $\mu\text{m/s}$
fast comb

- 18070406/E1-2

10 $\mu\text{m/s}$ meander

time distance

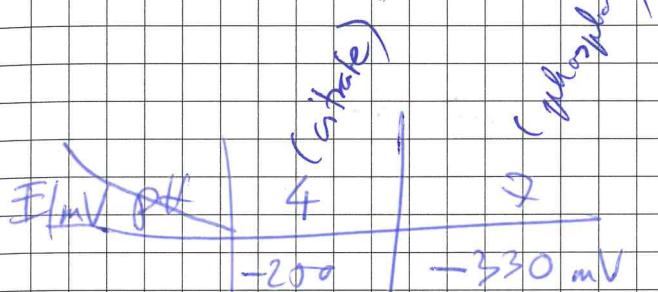
TITLE Autoway microelectrode tests

From Page No. _____

Hannah instruments pH meter

pH 211

microscrews pH meter



80mV / 3

26 mV / pH



Buffers were kindly provided by Katerina.

dilute

E/mV

E/mV

-368

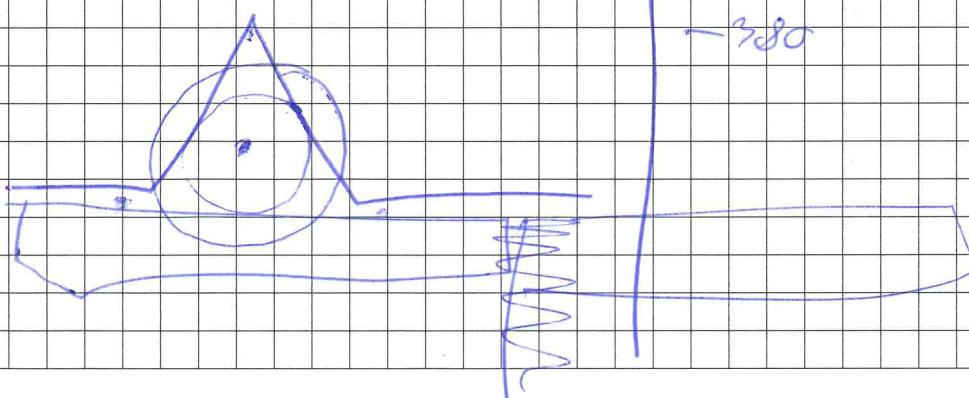
117 / 3

39mV / pH

4

-262

-380



To Page No. _____

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Date

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Date

Recorded by

TITLE Writing a script to fix the meander algorithm

From Page No. _____

Problem :

X Y Z

0	0	}
1	0	
2	0	
3	0	
4	0	
0	1	}
1	1	
2	1	
3	1	
4	1	

1st line

2nd line



The direction should be reversed for the even numbered lines, like this:

X Y Z

0	0
1	0
2	0
3	0
4	0
4	1
3	1
2	1
1	1
0	1

To Page No. _____

Witnessed and understood by me

Date

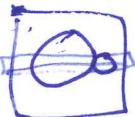
Invented by

Date

Recorded by

180705

HEKA



From Page No. _____

fc2m.sh "Fast curl to meander"

inputs : 1 # of ~~point~~ points in a line (x)

example from the left : x=5

2 # of lines (r)

example from the left : y=2

usage: fc2m -x 5 -y 2 -f test.txt
-o test-o.txt

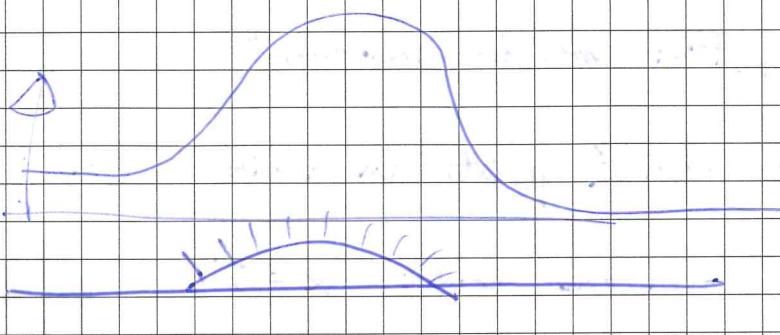
bash arguments : getopt

```
while getopt u:d:p:f: option
do
case "$OPTARG" in
in
u) USR=$OPTARG;;
d) DST=$OPTARG;;
p) PRT=$OPTARG;;
f) FNC=$OPTARG;;
:
esac
done
```

→ finished script on next page!

To Page No. _____

From Page No. _____



```

#!/bin/bash

POSITIONAL=()
while [[ $# -gt 0 ]]
do
key="$1"

case $key in
-x|--x)
x="$2"
shift # past argument
shift # past value
;;
-y|--y)
y="$2"
shift # past argument
shift # past value
;;
-if|--inputfile)
inputfile="$2"
shift # past argument
shift # past value
;;
-of|--outputfile)
outputfile="$2"
shift # past argument
shift # past value
;;
*)      # unknown option
POSITIONAL+=("$1") # save it in an array for later
shift # past argument
;;
esac
done
set -- "${POSITIONAL[@]}" # restore positional parameters

#old version done with sed, not complete
#cp /dev/null $outputfile
#for i in $(seq 0 2 $y); do
# sed -n "$((i*x+1)),${((i*x+x))} p" "$inputfile" >> "$outputfile"
# sed -n "$(((i+1)*x+1)),${((i+1)*x+x))} p" "$inputfile" | tac >> "$outputfile"
#done

#with awk
cp /dev/null $outputfile
for i in $(seq 0 2 $y); do
awk -v line="$i" "NR>=${((i*x+1))} && NR<=${((i*x+x))}" '{print $2*1000000, line, $3*1000000000000}' \
$inputfile >> $outputfile
awk -v line="$i" "NR>=${((i+1)*x+1))} && NR<=${((i+1)*x+x))}" '{print $2*1000000, line+1,
$3*1000000000000}' "$inputfile" | tac >> "$outputfile"
done

```

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

TITLE Trying out a new technique to fabricate Sb microelectrodes

From Page No. _____

~~borosilicate glass~~
~~antimony powder~~

P-1000 borosil. glass

180710

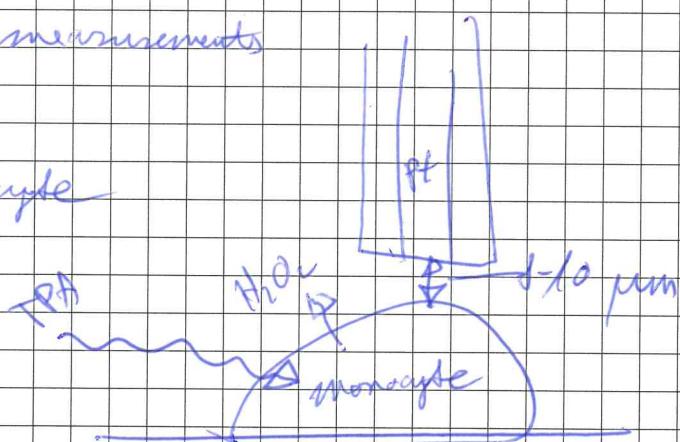
H_2O_2 measurements

above monocyte

$$E = 650 \text{ mV}$$

$$50 \mu\text{m} / 50 \mu\text{m}$$

$$2 \mu\text{m} / 2 \mu\text{m}$$



180710-1. dat

1. 3D-scan: fast calc $5 \mu\text{m}/\text{h}$

2. ~~an~~ - meander $10 \mu\text{m}/\text{h}$

plate omitted

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

180709

3
TITLE Testing antimony microspheres prepared yesterday

From Page No. _____

 $E@ pH=7 PBS$ (mV)

- | | |
|----|---------|
| 1 | — |
| 2 | -403.16 |
| 3 | -394 |
| 4 | -378 |
| T | -363 |
| 6 | -350 |
| 7 | -358 |
| 8 | -350 |
| 9 | -358 |
| 10 | -357 |

9/10

 $62 \text{ pixel} = 10 \mu\text{m}$ (40X)

cell	bulk
-415	-413
-416	-413

17th bulk
24 cell
25 bulk

+ E. coli.

31 bulk
35 cell
41 (monocyte)
52 4:30
 6:30

-430mV $\xrightarrow{300\mu\text{l}}$ -696mV
1N NaOH

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE Attempting to image yeast cell CO₂ output

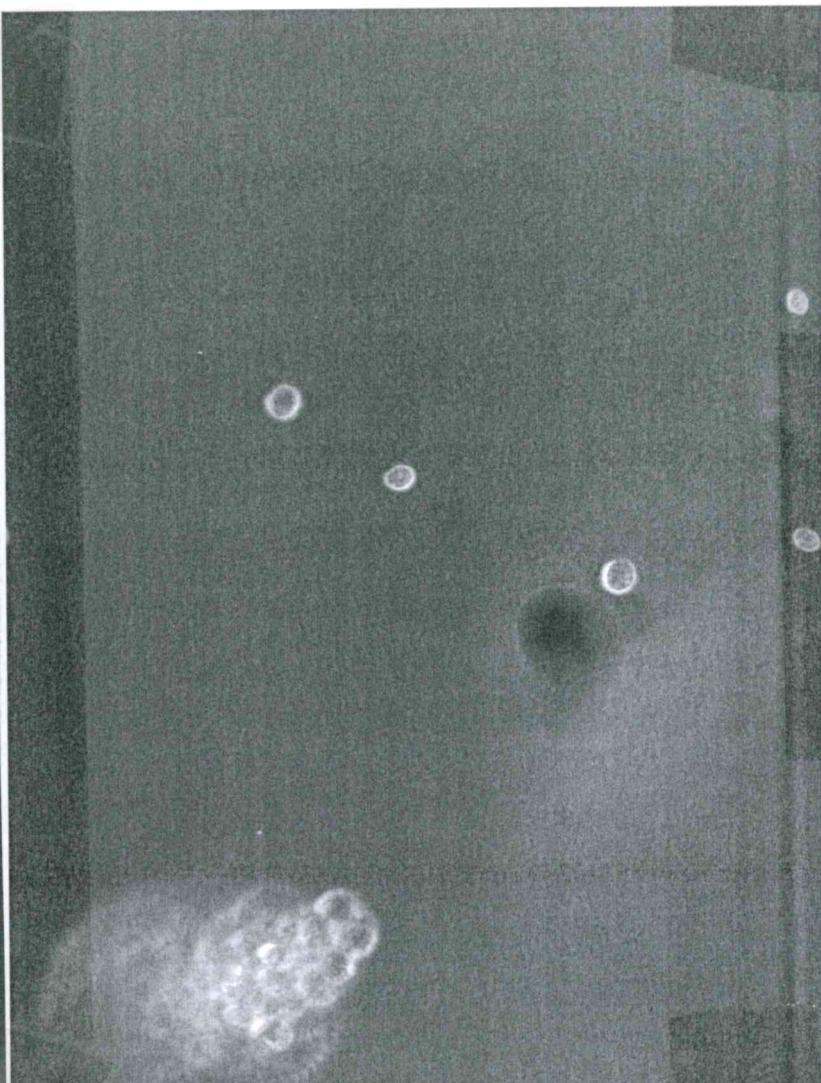
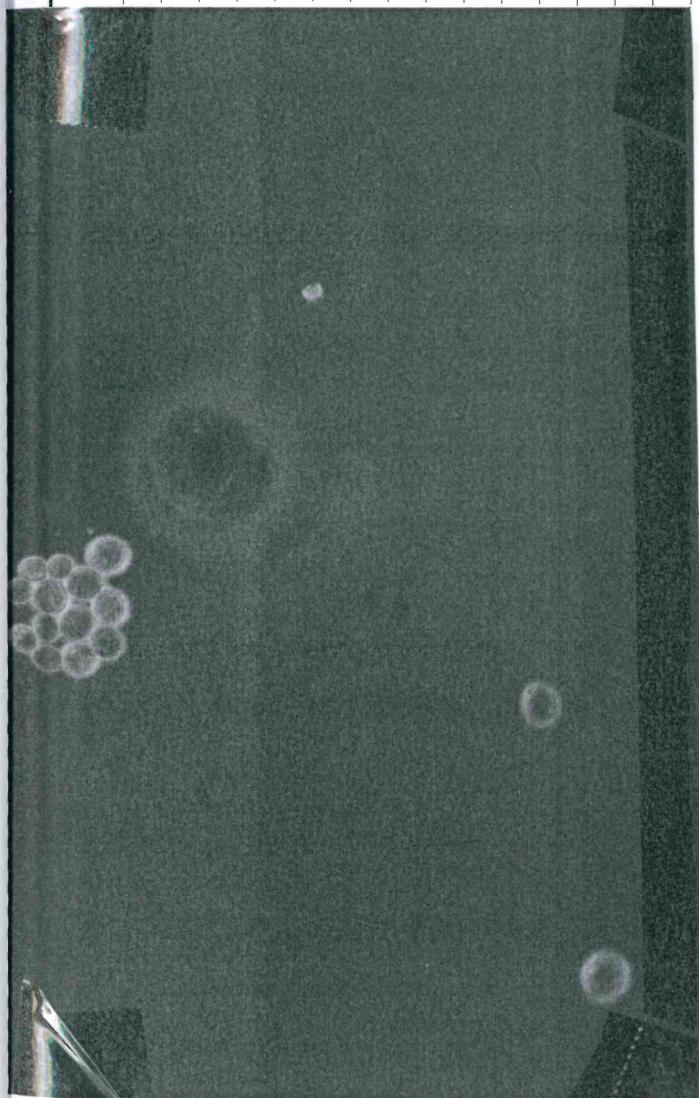
From Page No. _____

Broth : 2g glucose in 100 ml d.w.

Yeast : "Oma's Ur-Hefe Universal" from Edeka

I could not observe any pH change above
the yeast cells.

(Pt electrode #7 broke.)



Witnessed and understood by me

Date

Recorded by

Date

180713

TITLE Masuring oxygen above the human monocytes

From Page No. _____

180716-01

E1 - ?

incomplete



Monocytes 6 days old

$100\mu\text{m} \times 100\mu\text{m}$ area
 101×101 points



$1\mu\text{m} \times 1\mu\text{m}$ step size

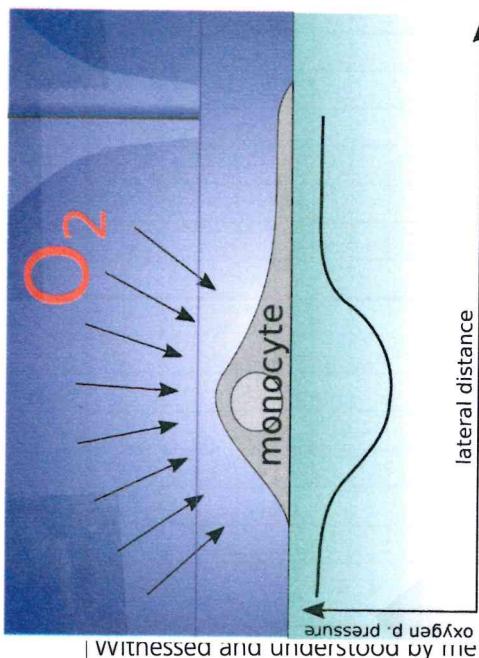
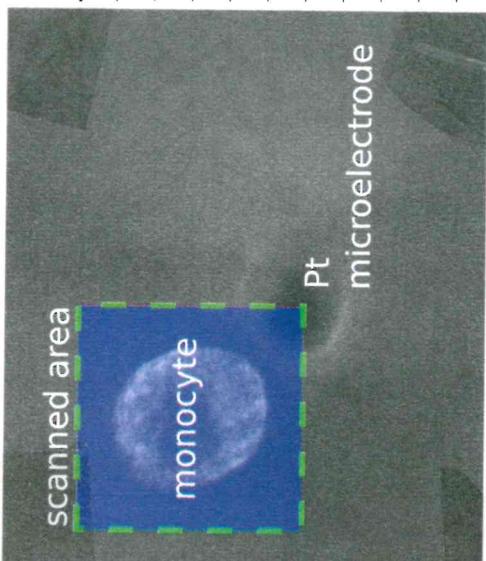
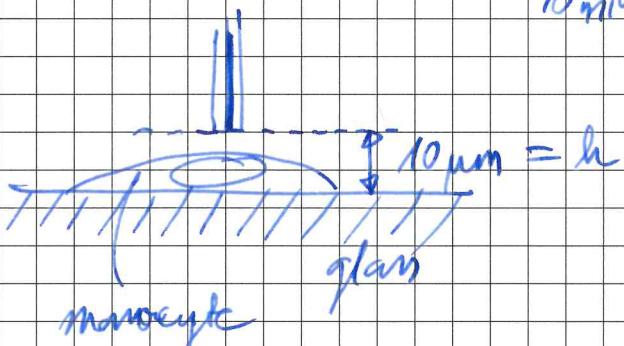
$10\mu\text{m}/\text{s}$ scanning speed
meander algorithm
electrode #8



$E = -700\text{mV}$ vs. quasi-reference

(dissolved oxygen in

medium + electrolyte: PBS
 10mM glucose



To Page No. _____

Date

Invented by

Date

180716

Recorded by

TITLE _____

Book No. _____

From Page No. _____

E1-3

40 μm / 60 μm

41 X 41

5 $\mu\text{m/s}$ meander

incomplete

start: 3

finish: 4

(Cell 180716_003.TIF)

E1-4

40 μm X 40 μm

41 X 41

incomplete

1 $\mu\text{m/s}$ fast comb

E1-5

40 μm X 40 μm

41 X 41

 $h = 3.15 \mu\text{m}$ 10 $\mu\text{m/s}$ meander

E2-1

60 μm X 60 μm

61 X 61

0.7 $\mu\text{m/s}$ fast comb

neur cell

 $z = -26.71 \mu\text{m}$

E2-8

x y

40 X 40

801 X 41

fast comb

1 $\mu\text{m/s}$

40 X 40

401 X 41

meander

10 $\mu\text{m/s}$

E2-10-11-

20 $\mu\text{m/s}$ meander

E2-9

Only → 401, because it's 10 times faster

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

HEKA

E2-11-11

10 $\mu\text{m/s}$
meanderE2-11-11
0.7 $\mu\text{m/s}$
fast comb

From Page No. _____

$v(\mu\text{m/s})$ fast comb meander

1 (E2-13)

5 E2-8

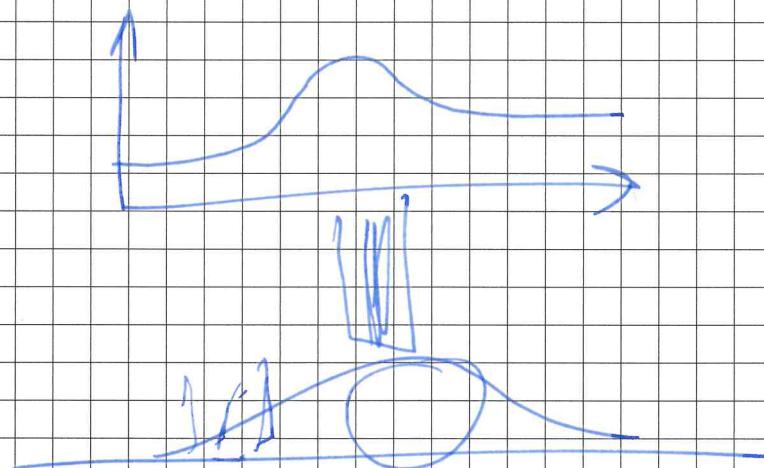
10 E2-9

20 E2-10

50 E2-11

+ step response? 

cell dead: E2-15



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

From Page No. _____

 $+ 20\text{ }\mu\text{l of } 100\text{ mM H}_2\text{O}_2$

$$V_{\text{total}} = 2 \text{ ml}$$

$$20 \cdot 10^{-6} \text{ dm}^3 \cdot 0.1 \frac{\text{mM}}{\text{dm}^3}$$

~~$2 \cdot 10^{-5}$~~

$2 \cdot 10^{-5} \text{ dm}^3$

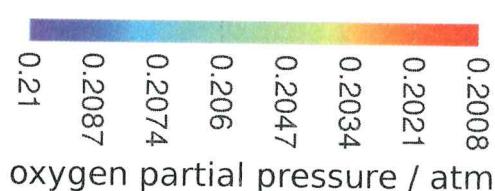
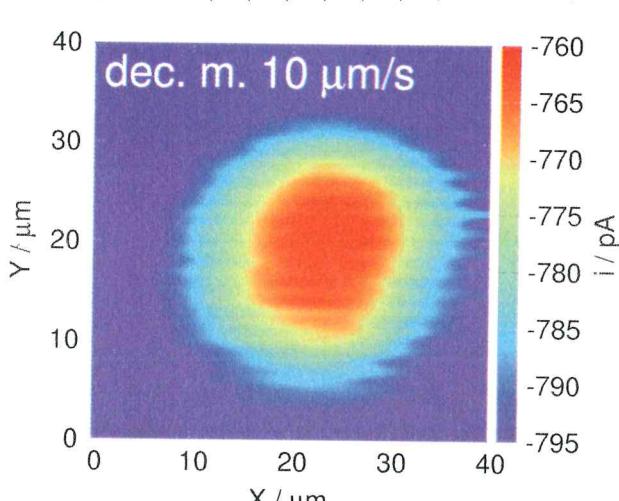
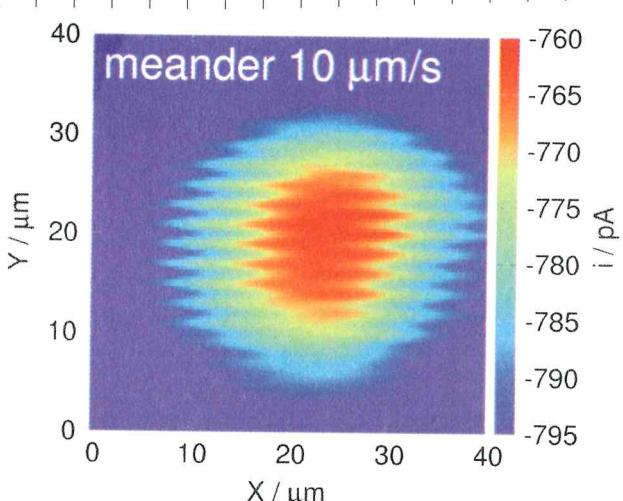
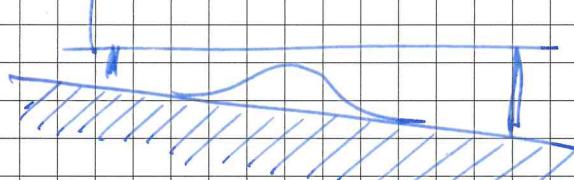
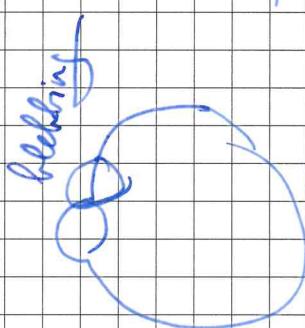
$2 \cdot 10^{-8} \text{ mol}$

$2 \text{ pmol in } 0.002 \text{ dm}^3$

$c = \frac{0.00002 \text{ mol}}{0.002 \text{ dm}^3}$

~~\downarrow~~

$c = 1 \text{ mM H}_2\text{O}_2$



E2-9

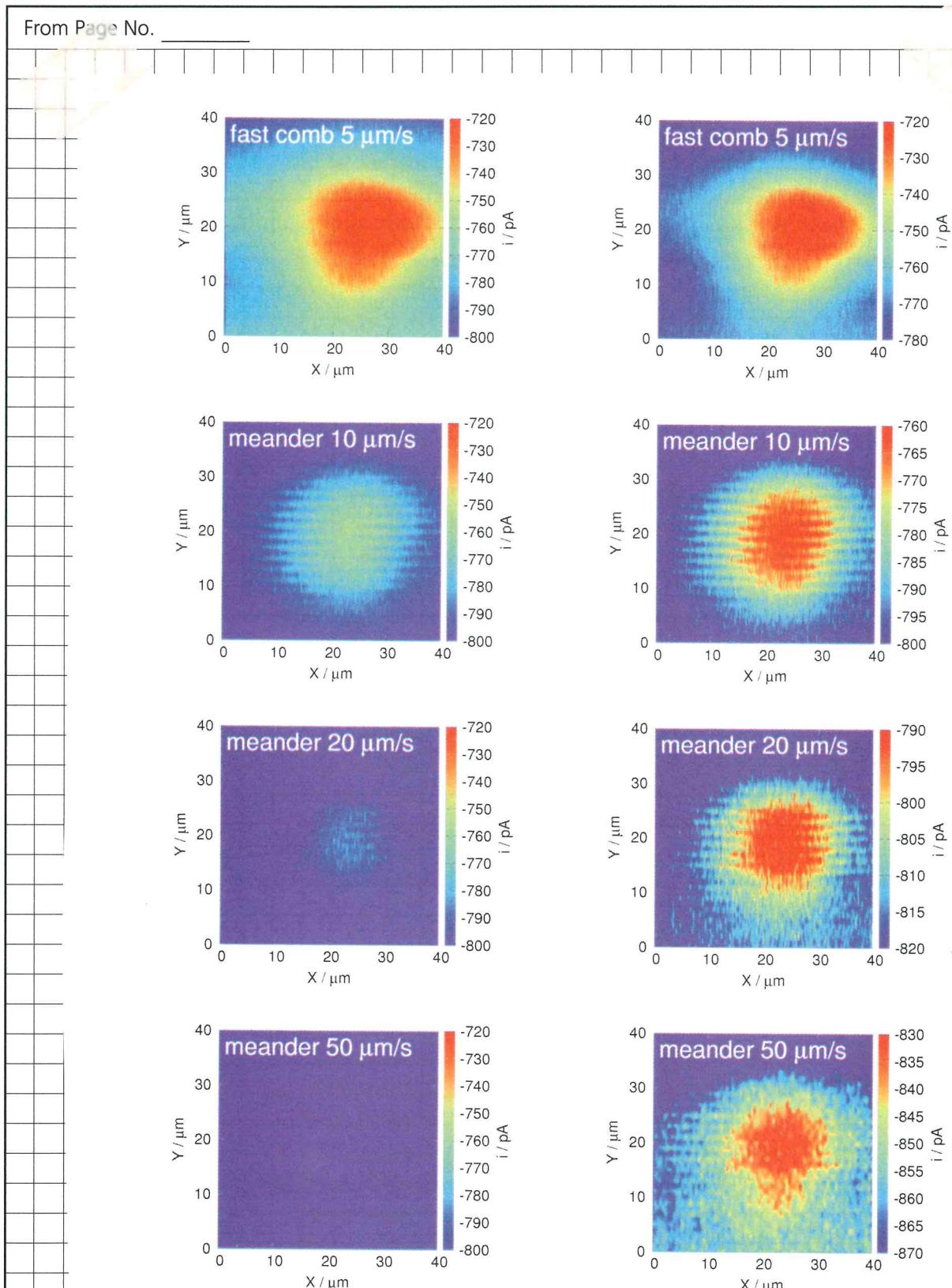


Figure 1: Oxygen reduction current above a human monocyte at $h = 10 \mu\text{m}$ relative to the glass bottom of the Petri-dish. Working electrode: $d = 10 \mu\text{m}$ Pt UME. $\text{RG} \approx 2.5$. $E = -700 \text{ mV}$ vs. Ag/AgCl quasi-reference electrode. Medium/electrolyte: PBS + 10 mM glucose. Date: 2018.07.16. Left column: fixed scale -800 pA to -720 pA. Right column: autoscale.

10 page in

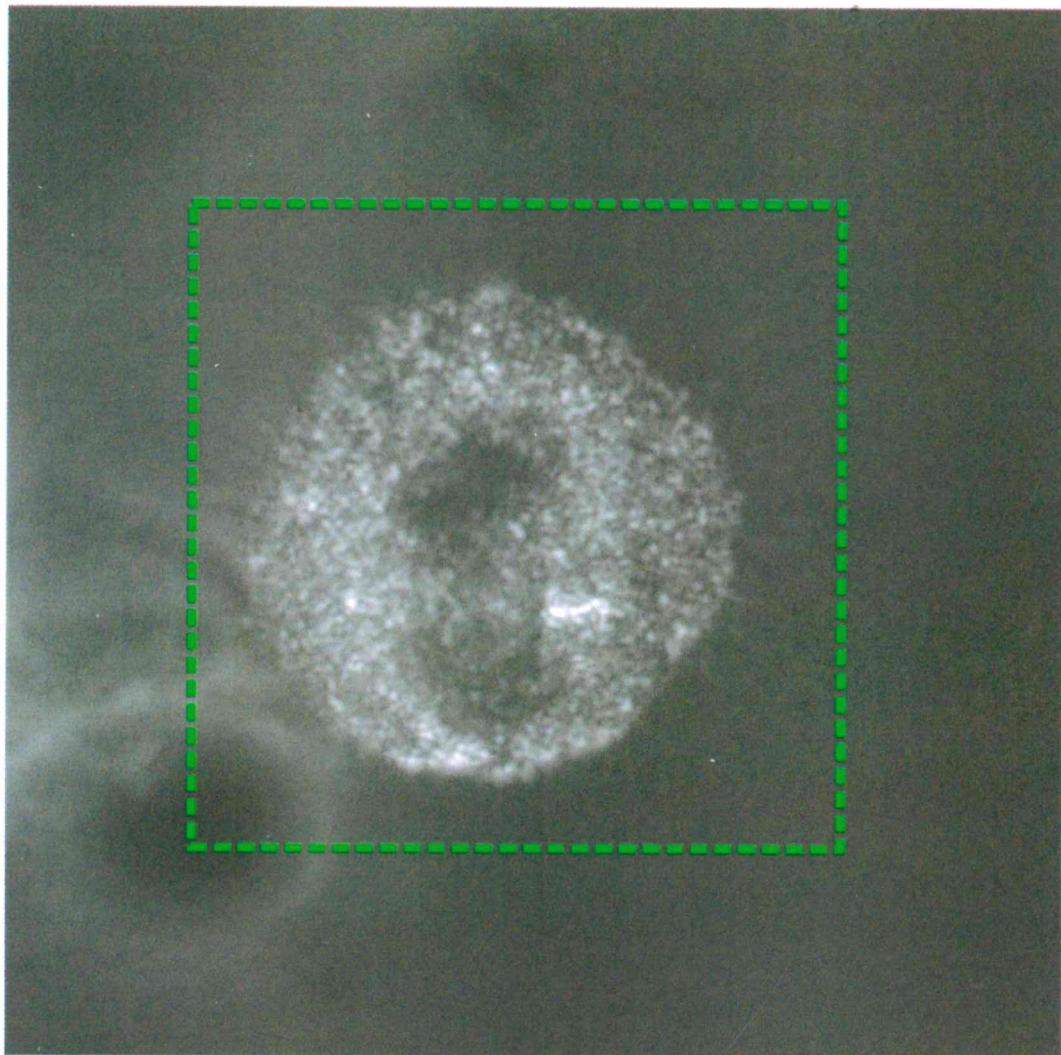
Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

Project No. _____

TITLE _____

Book No. _____

From Page No. _____



To Page No. _____

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Invented by

Date

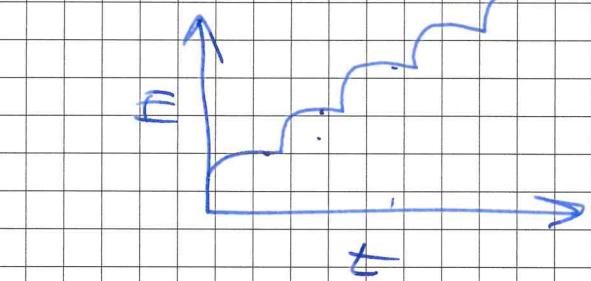
Recorded by

From Page No. _____

1, Create pH = 6 6.5 + 7.0 + 7.5 + 8.0 buffer
 ↓ (PPS) ↓ ↓ ↓ ↓
 real pH 6.06 6.17 7.06 7.0 8.03 8.42
 8.42
 adjusted with 1N HCl and 1N NaOH

measured with Hanna pH 211

pH	E/mV
6.06	-293.1
6.57	-318
7.06	-344
7.5	-364
8.03	-388
8.42	-403



D. Nehrbom

Ag/AgCl/3M KCl
ref. electrode

with HEKA
patch-clamp
EPC 10 USB

To Page No. _____

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Date

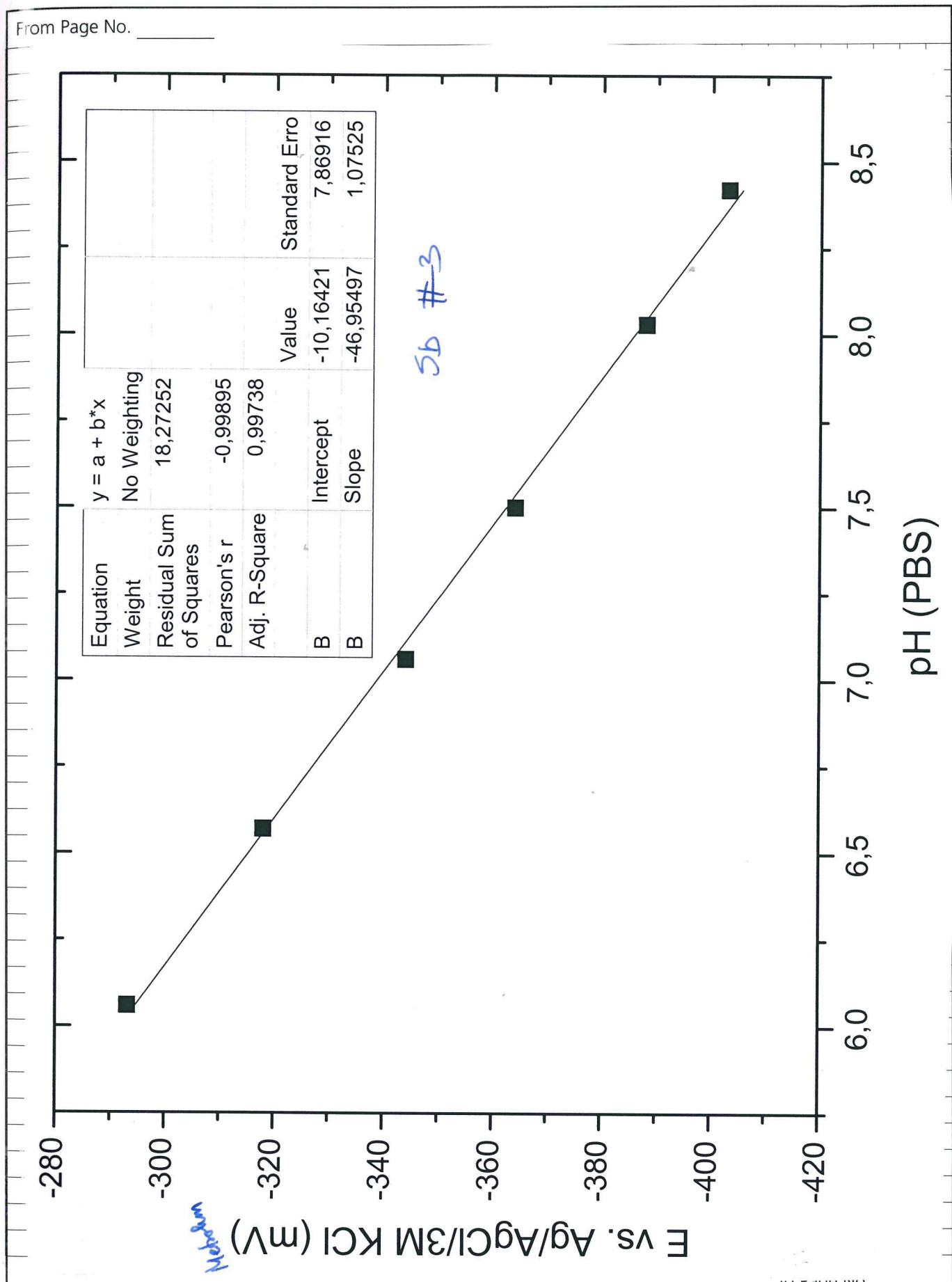
Recorded by

Project No. _____

TITLE _____

Book No. _____

From Page No. _____



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Date

Invented by

Date

Recorded by

On day of

From Page No. _____

ph	$E\text{ (mV)}$ vs Ag/AgCl quan- ^{ag.} (chlorinated silver wire)
6.06	-315
6.57	-336
7.06	-358
7.5	-377
8.03	-397
8.42	-415

The slope is similar to that of V measured with an $\text{Ag}/\text{AgCl}/3\text{M KCl}$ reference ref. electrode.

The potentials are shifted by about -20mV , as a consequence of the shift in the potential of the reference half-cell.

The minor difference ^{of} a^-ce^- of the buffers doesn't seem to effect the response noticeably.

To Page No. _____

Witnessed and understood by me

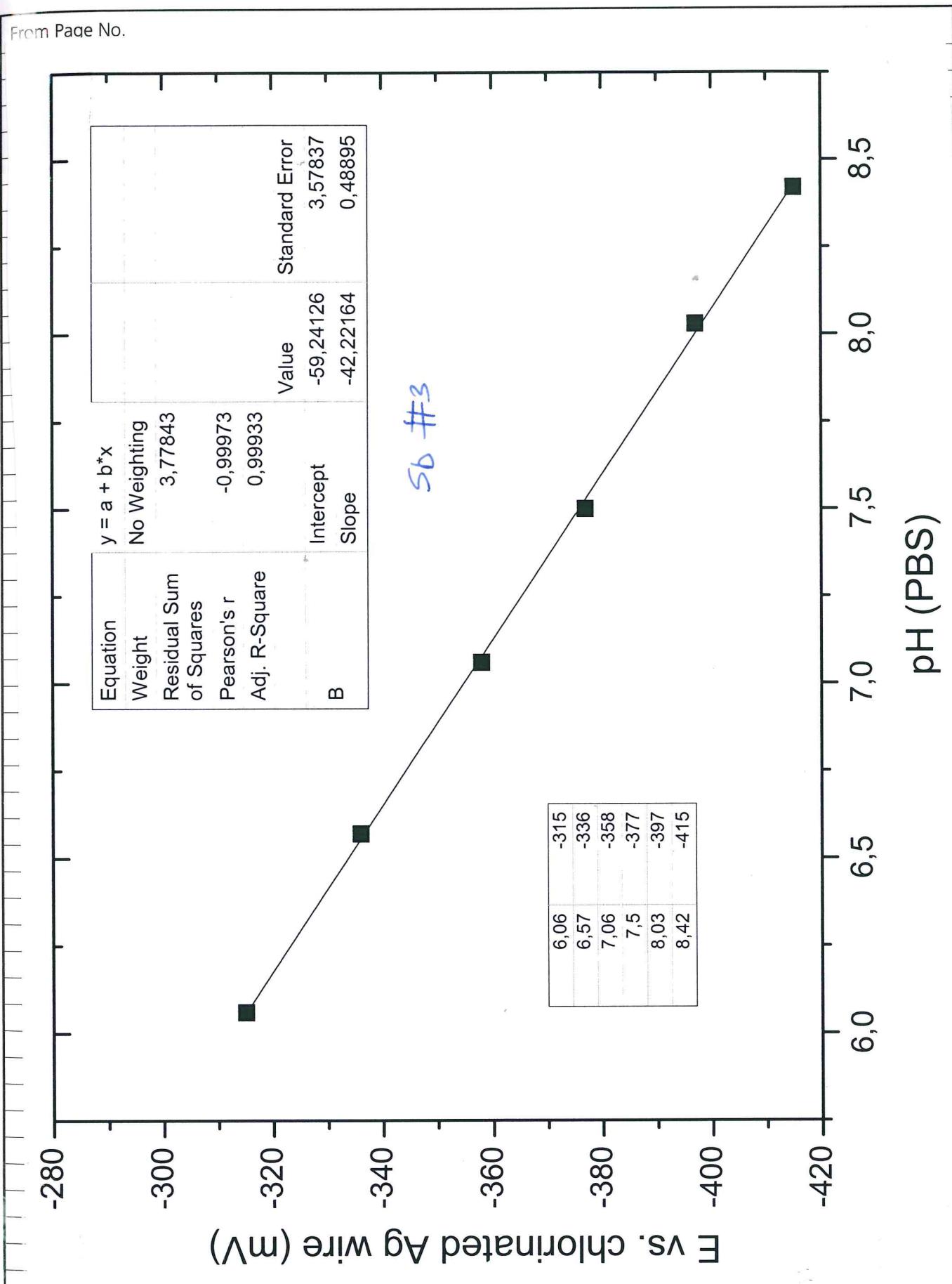
Date

Invented by

Date

Recorded by

From Page No.



To Page No. _____

Witnessed and understood by me

Date

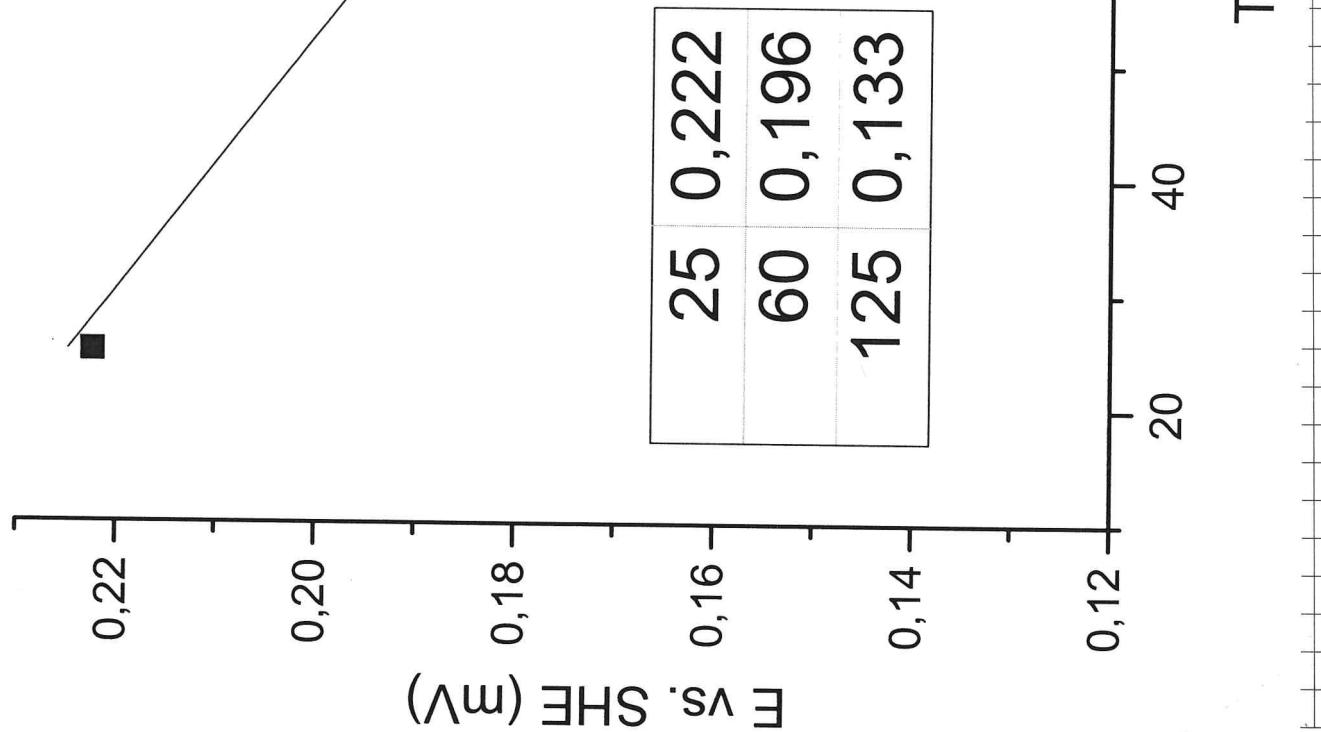
Invented by

Date

Recorded by

From Page No.

$y = a + b*x$	
Weight	No Weighting 2,12919E-5
Residual Sum of Squares	
Pearson's r	-0,99748
Adj. R-Square	0,98994
B	
Value	
Intercept	0,24735
Slope	-9,04437E-4
Standard Error	0,00523
	6,42989E-5



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Date

Invented by

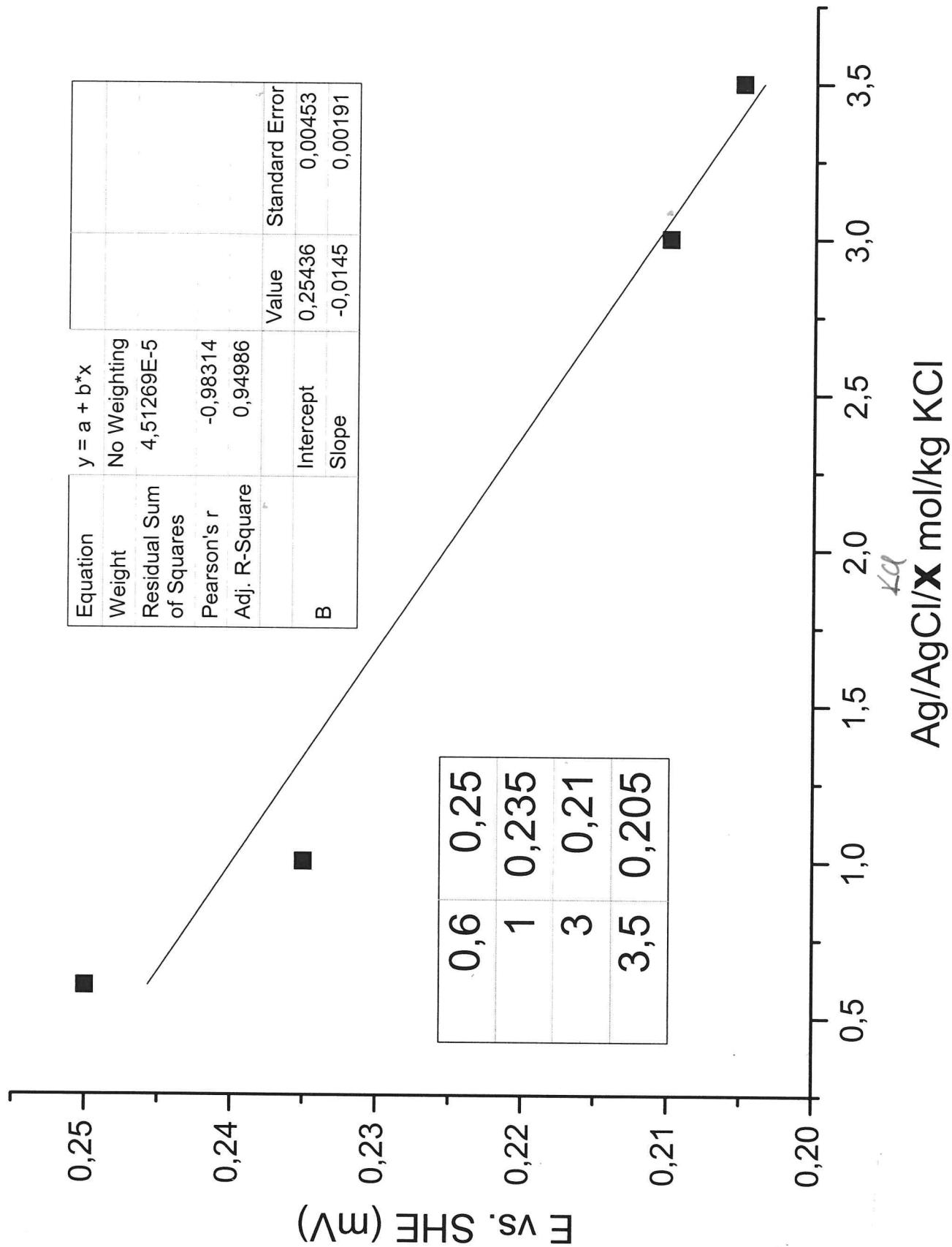
Date

Recorded by

TITLE _____

From Page No. _____

	$y = a + b \cdot x$
Equation	No Weighting
Weight	4,51269E-5
Residual Sum of Squares	
Pearson's r	-0,98314
Adj. R-Square	0,94986
B	
Intercept	0,25436
Slope	-0,0145
	Value Standard Error
	0,00453
	0,00191



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TITLE Investigating the noise problem

Book No. _____

From Page No. _____

The noise in chronoamperometric measurements increased as temperature increases.

2ml PBS

 $E = 650 \text{ mV}$

Pt UME # 8

 $t = 36.8^\circ\text{C}$

$$\{\text{noise} \approx 3.48 \text{ pA} - 3.53 \text{ pA} \approx 305 \text{ fA}$$

1:22:30 thermostat off

$t / ^\circ\text{C}$	$\approx \text{noise}$
36.8	305 fA
32.8	270 fA
31.3	200 fA
30.0	150 fA - 150 fA
28.0	130 fA
22.0	110 fA
20.0	90 fA
23.0	60

Arrhenius - equation

$$k = A e^{-\frac{E_a}{RT}}$$

(1:51 :00 + ice $\approx 18^\circ\text{C}$)
 (1:54 :00 + ice)

16°C	58 fA
--------------------	-------

To Page No. _____

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Date

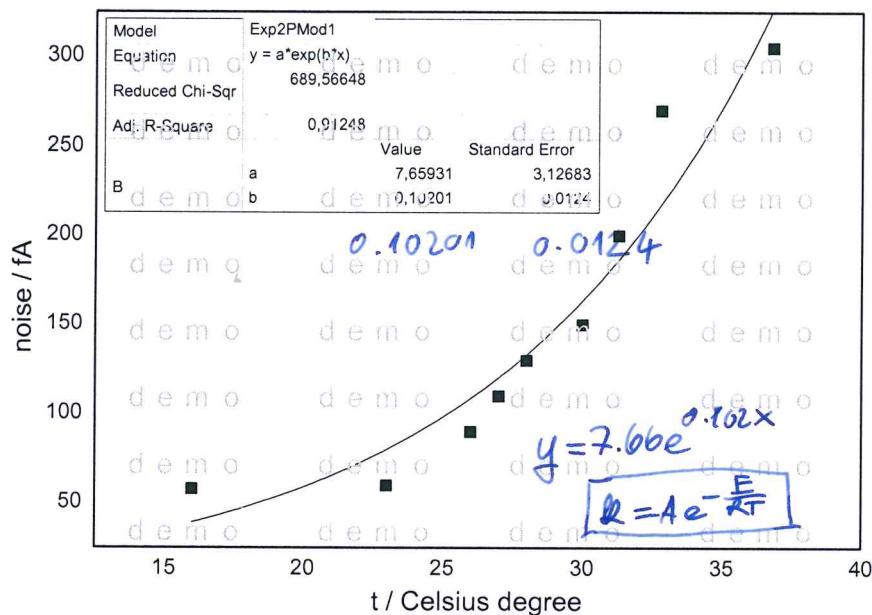
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180719

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From Page No. _____



The observed noise might be caused by the increased reacbin rate. It appears that the magnitude of the noise follows the Anderius Law.

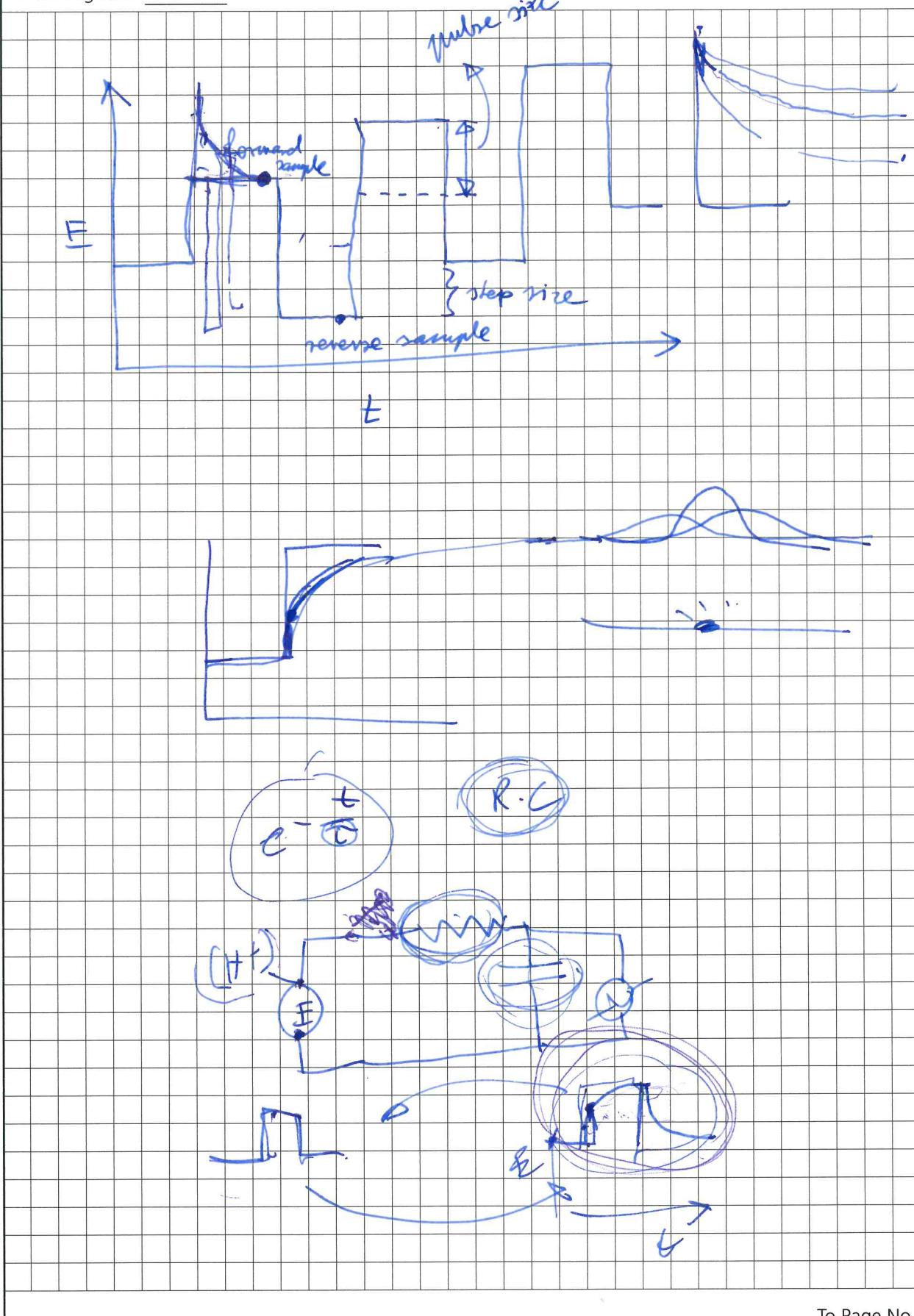
$$R = A e^{-\frac{E}{RT}}$$

Note on 2010.08.07:
The signal is not increasing with temp., as reacbin, because the rate limiting step is not the electrode reaction. Its transport limited.

TITLE Square wave voltammetry

(Dianovin with Valentin)

From Page No. _____



To Page No. _____

Witnessed and understood by me

Date _____

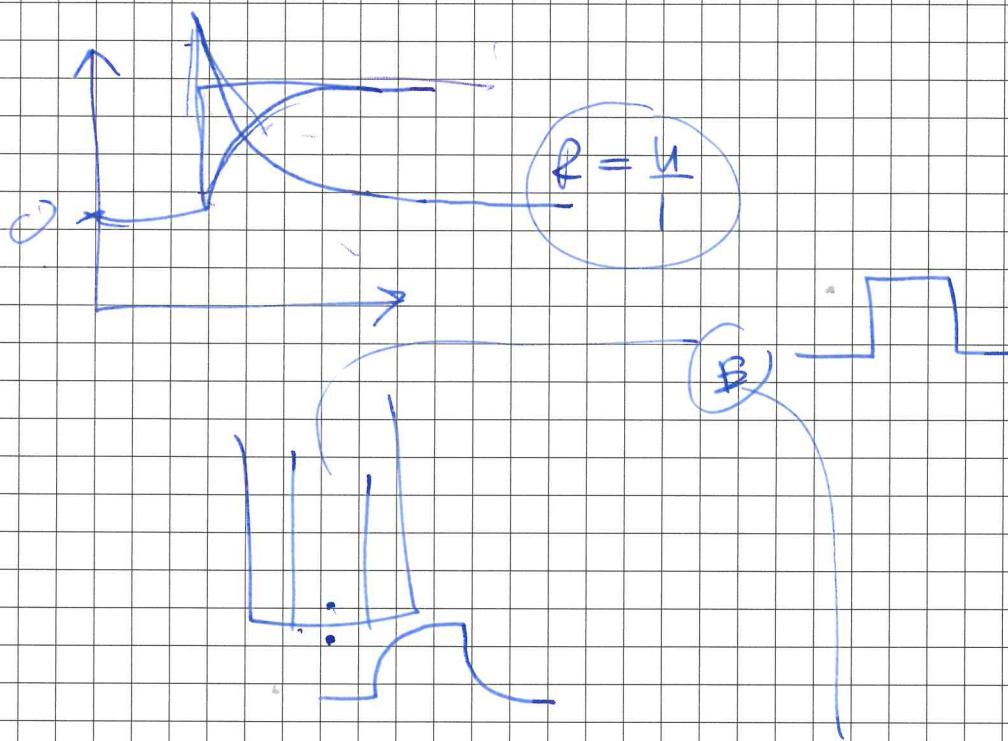
Invented by _____

Date _____

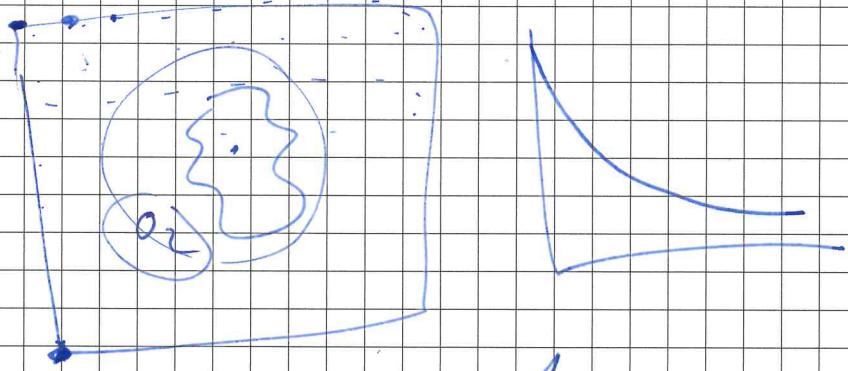
Recorded by _____

TITLE _____

From Page No. _____

Discussion with Valentine

$$i_t = a e^{-\frac{t}{\tau}} + \frac{1}{\sqrt{t}} b e^{-\frac{t}{\tau}}$$



$$\frac{1}{\sqrt{t}}$$

$$y = \frac{1}{\sqrt{x}}$$

$$x = \left(\frac{1}{y}\right)^2$$

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE Platinum etching in aqua regia

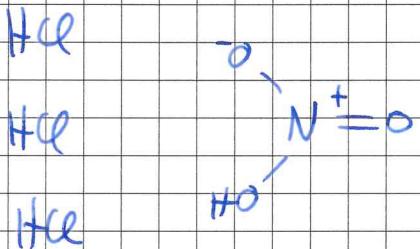
Book No. _____

3

From Page No. _____

mole ratio

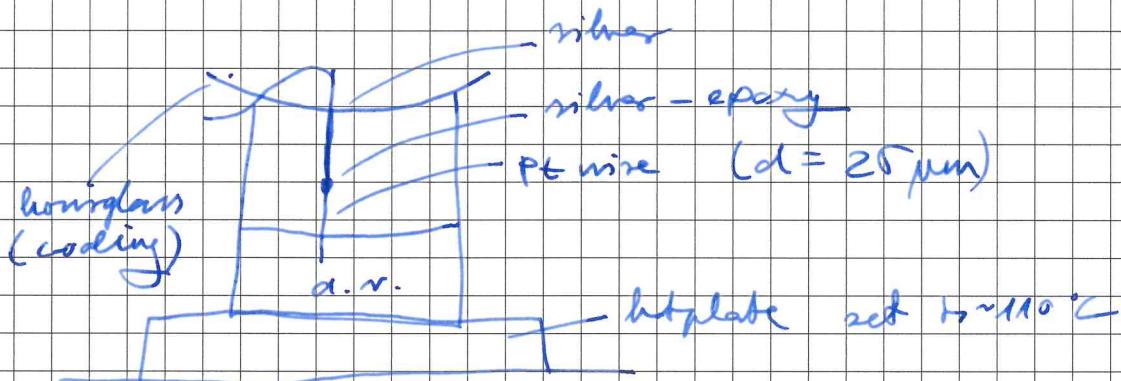
Aqua regia : 1:3 V mixture of HNO_3 and HCl
 cc. cc.



(Mordet) $[\text{HNO}_3] = 6.66 \frac{\text{mol}}{\text{dm}^3}$ (not cc.) this was a very old solution
 $[\text{HCl}] = 11.65 \frac{\text{mol}}{\text{dm}^3}$, 321. (cc)

2 ml HNO_3 sol.
 3.3 ml HCl sol.

$t \approx 100^\circ\text{C}$



etch start : 13:00
 finish : 13:40

10 μm Pt wire was etched
 down to ~2.5 μm

To Page No. _____

Witnessed and understood by me

Date

180724

Invented by

Recorded by

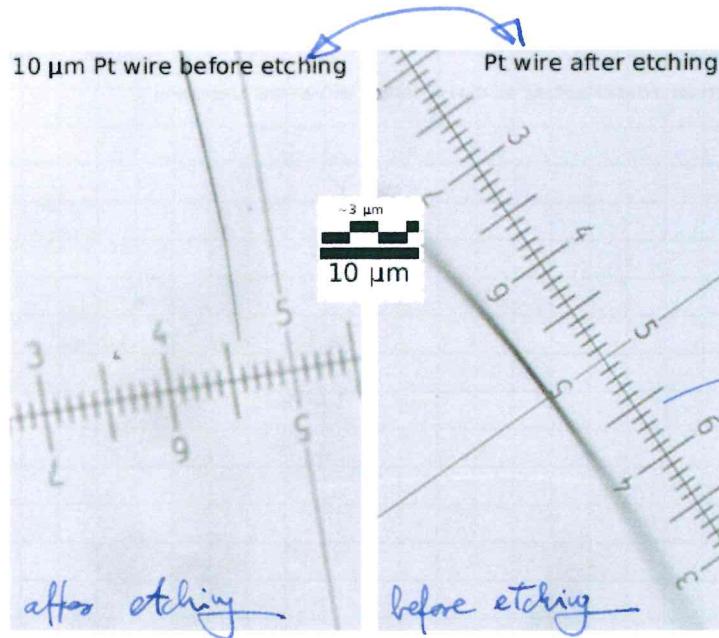
Date

Project No. _____

TITLE _____

Book No. _____

From Page No. _____



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

From Page No. _____

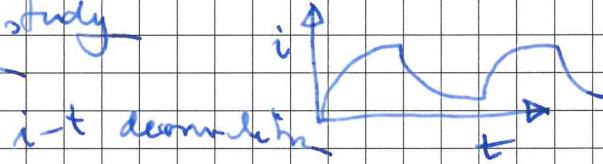
- 1, introduction ↗ what is SECM
- 2, previous work ↗ potentiometry
- 3, SECM Conference Würm
- 4, question: "Can it be done for amperometric SECM?"

5, YES: page 3. ↗ amperometric cell, feedback ...

6, I've started a vigorous study ↗

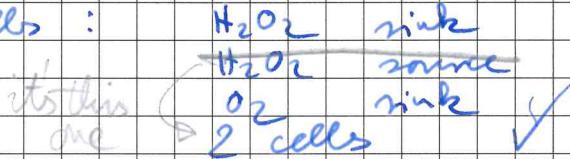
7, glass sheet ↗

8, Pt wire ↗



deconvolution worked
surprisingly well!

9, cells:



PSF

:

10, thank you ↗ photos from PECs

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

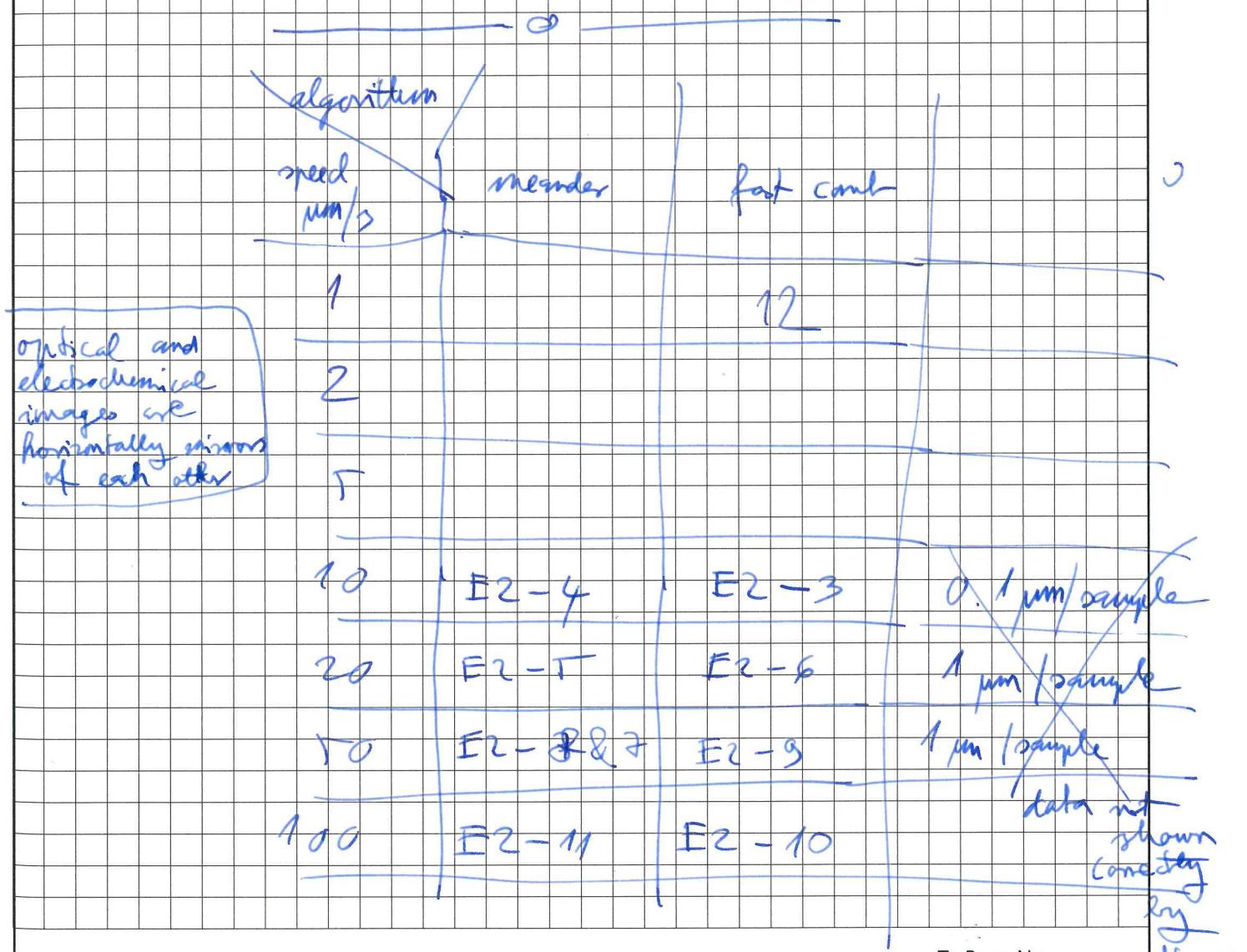
160726

Recorded by

From Page No. _____

- 1, O₂ reduction above glass sheet / bulk
- 2, ~~O₂~~ change response
- 3, very slow scan (O₂ reduction) for spatial deconvolution
(slowest possible)
0.1 $\mu\text{m}/\text{s}$?

- with circular Pt electrode 10 μm
- electrolyte: PBS + 10 mM glucose (same as for monocytes)



Witnessed and understood by me

Date

Invented by

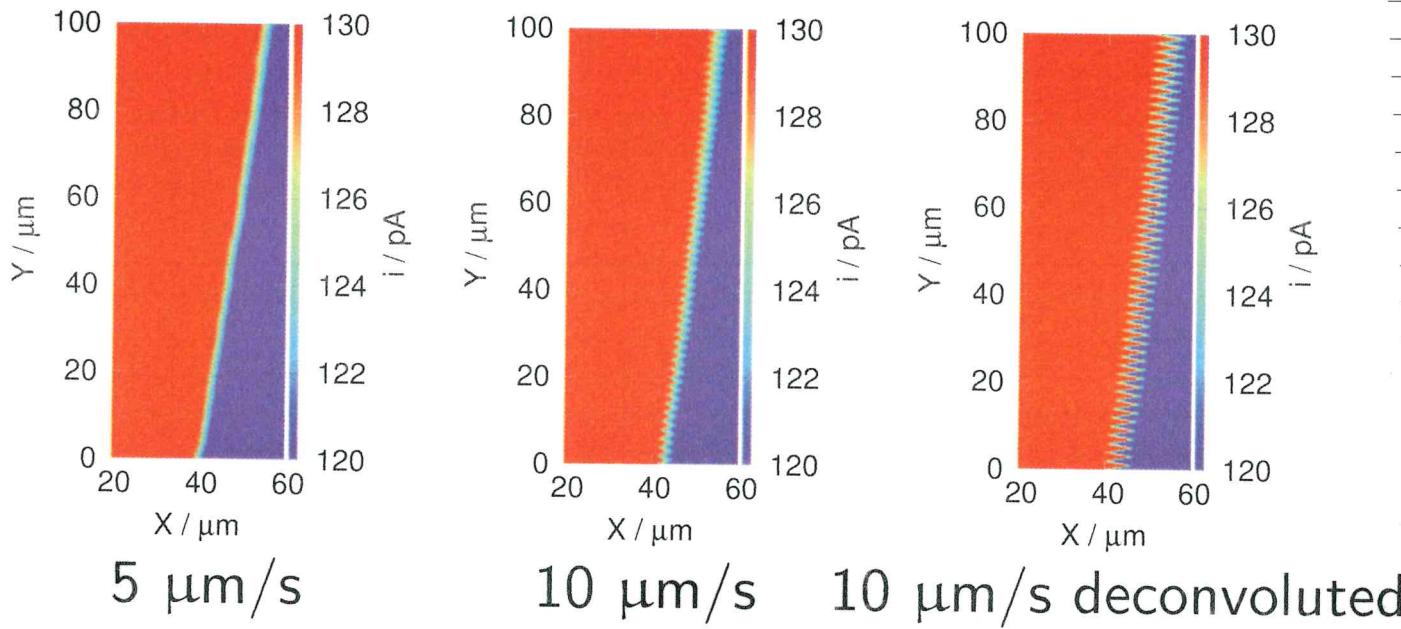
Date

Recorded by

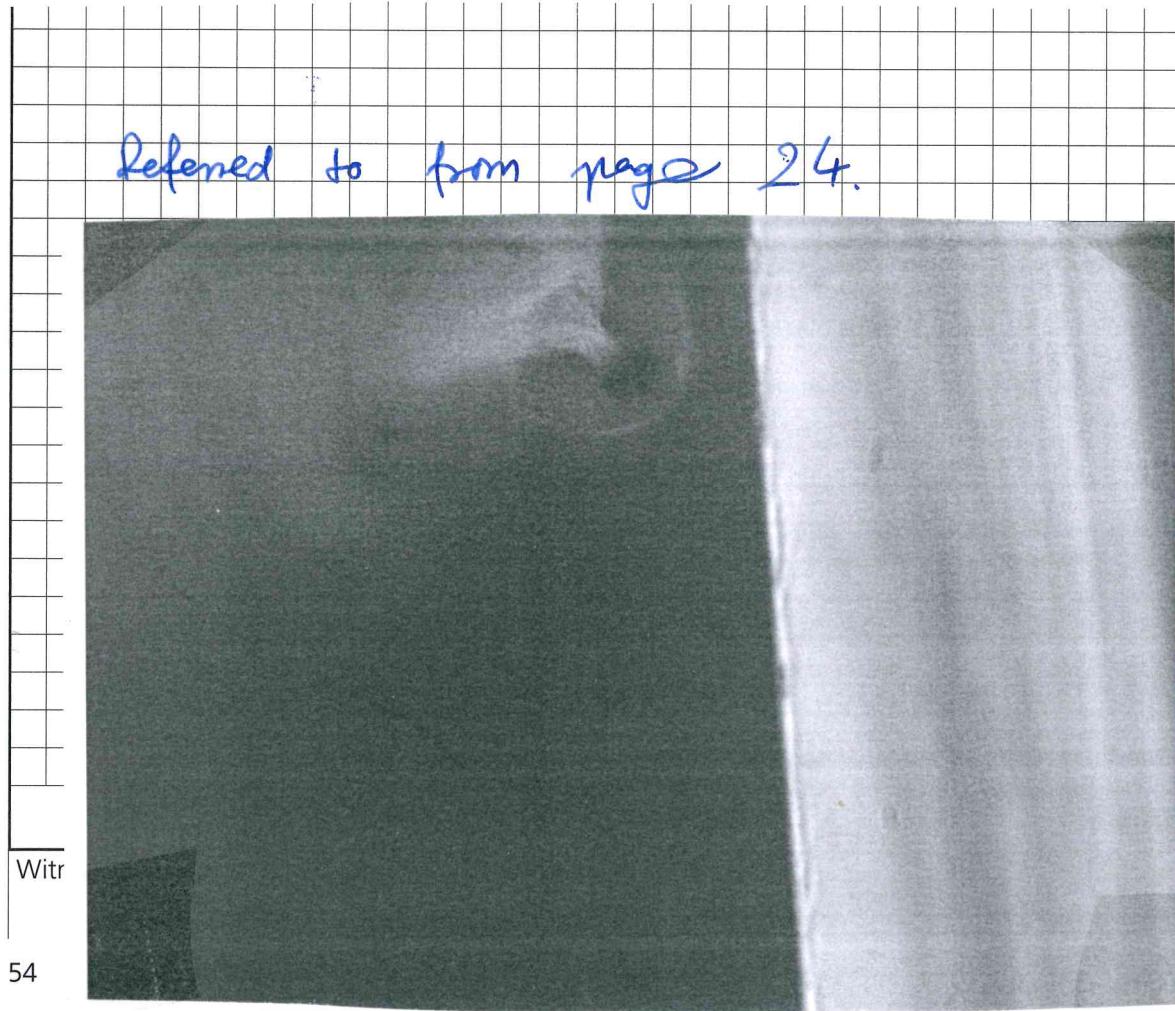
E2-13 is far spatial deconvolution!

53

From Page No. _____



Referred to from page 24.



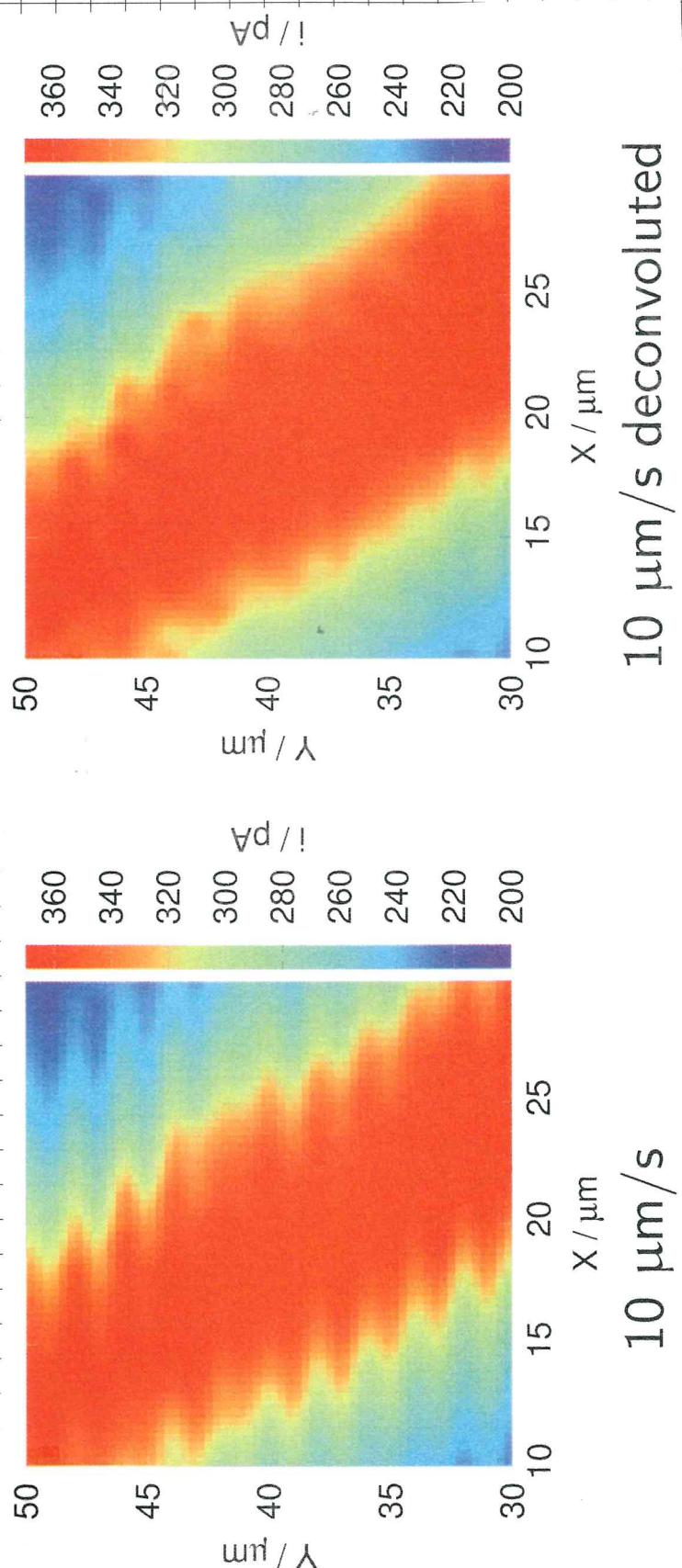
Optical image is mirrored horizontally because it's taken with the inverse mirror and the HEMI is not

Project No. _____

TITLE _____

Book No. _____

From Page No. _____



To Page No. _____

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Invented by

Date

Recorded by

Replaced to on page 18.

TITLE Deconvolution of already slow image

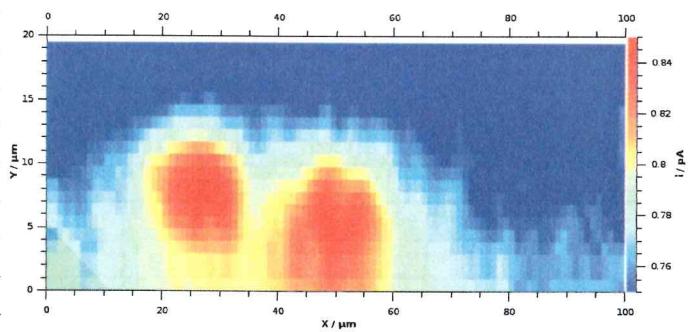
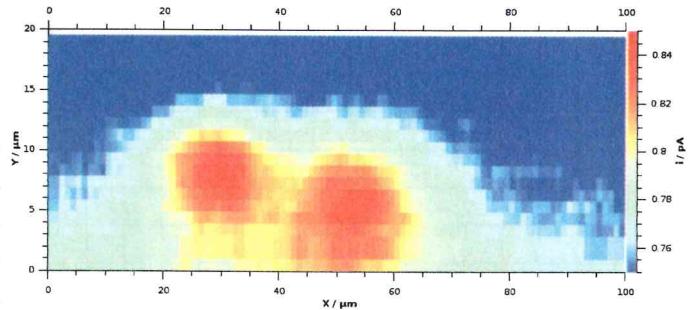
From Page No. _____

Targets: 2 monocytes stimulated with TPA.



extracellular H_2O_2
conc. increases.

scan rate: $2 \mu\text{m}/\text{s}$



From: 2014. april 1.

There isn't much improvement. The image was already pretty good.

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

From Page No. _____

```

#!/usr/bin/enc python

"""

Deconvolution of distorted SECM images.
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along with this program; if not, write to the Free Software
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston,
MA 02110-1301, USA.

Here is a first attempt at porting the deconvolution algorithm
from FORTRAN to python. The gaussian filter is not yet implemented
in the program. Right now I do it with the plotting software (gnuplot),
but it would be better if the python program did it. Also, I haven't
done the command line argument interpreter yet, so the file name must
be changed in the code every time. A GUI would be nice, and a live plot
of the convoluted and deconvoluted image. For that, the XYZ data needs
to be converted to a matrix.

"""

import numpy as np
import subprocess

conv_img = np.loadtxt("9_41_meandered.txt")
deconv_img = np.copy(conv_img)
e0 = np.float32(conv_img[0][2])
for n in range(0, conv_img.shape[0]):
    deconv_img[n][2] = np.float32((conv_img[n][2]-e0*0.68)/(1-0.68))
    e0 = np.float32(conv_img[n][2])

np.savetxt("9_41_meandered_deconvoluted.txt", deconv_img, delimiter=" ")

#proc = subprocess.Popen(['gnuplot', '-p'],
#                      shell=True,
#                      stdin=subprocess.PIPE,
#                      )
#proc.stdin.write('set xrange [0:10]; set yrange [-2:2]\n')
#proc.stdin.write('plot sin(x)\n')
#proc.stdin.write('quit\n') #close the gnuplot window

```

The deconvolution algorithm in Python.
I've written it on 2018.07.02.

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by