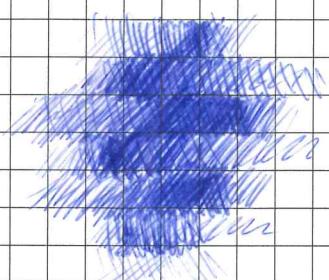


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92		

From Page No. _____

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



PBS buffer +
Tris glucose

(target was a cell)

Monocyte

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

The data is in the format:

0 0.00E+00 ; 1.23E-12
 1 /
 2 /
 3 /
 4 /
 5 /
 6 /
 7 /
 8 /
 9 /
 , ↓
 . ↓
 ← coordinate in m!
 ↓
 common separator
 common separator
 numeral of measurement
 current in A

The data is not in chronological order.

This should be the correct one:

0
1
2
3
4
5
6
7
8
9

Witnessed and understood by me

Date

Invented by

Date

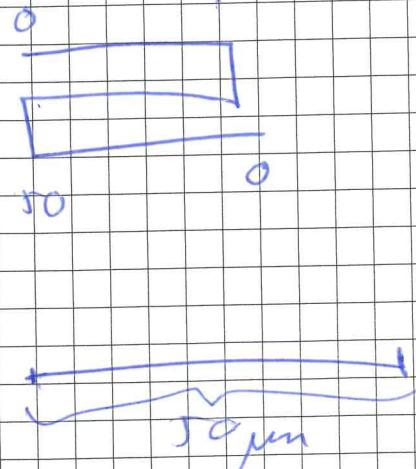
Recorded by

2018.06.14.

From Page No. _____

fax meander order :

~~01~~ 1 - 1001 ✓
 1002 - 2002 ↘
 2003 - 3003 ✓
 3004 - 4004 ↘
 4005 - 5005 ✓
 5006 - 6006 ↘
 6007 - 7007 ✓
 7008 - 8008 ↘
 8009 - 9009 ✓
 10010 - 11010 ↘
 11010 - 10010 ↗
 10011 - 11011 ✓
 11012 - 12012 ↘
 12013 - 13013 ✓
 13014 - 14014 ↗
 14015 - 15015 ✓
 15016 - 16016 ↗
 16017 - 17017 ✓
 17018 - 18018 ↗
 18019 - 19019 ✓
 19020 - 20020 ↗



140128_1EL-11_3.D.asc

1st

0

:

0

:

0

2nd

0

:

0

```
program deconvolution
implicit none
```

```
integer :: stat
real i, j, rc, e0, conv

rc=0.985

open(1,file='11.txt')
open(2,file='11_deconvoluted.txt')
read(1, *) i, j, e0
do
    read(1, *, iostat=stat) i, j, conv
    if (stat /= 0) exit
    write(2, *) i, j, ((conv - e0*rc)/(1-rc))
    e0=conv
end do
close(1)
close(2)

end program deconvolution
```

Python script is on
page 57!

To Page No. _____

Witnessed and understood by me

Date

Invented by *Andrea Kim*

Date

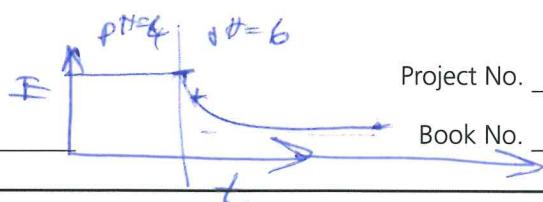
Recorded by

Project No. _____

Book No. _____

TITLE _____

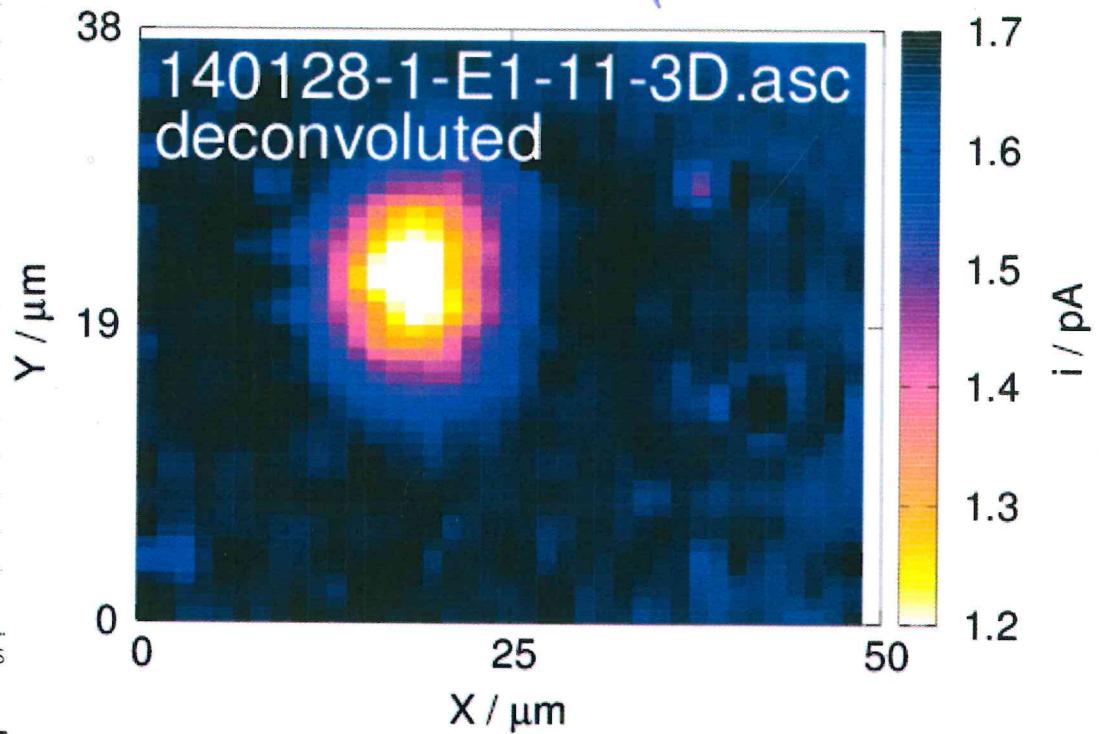
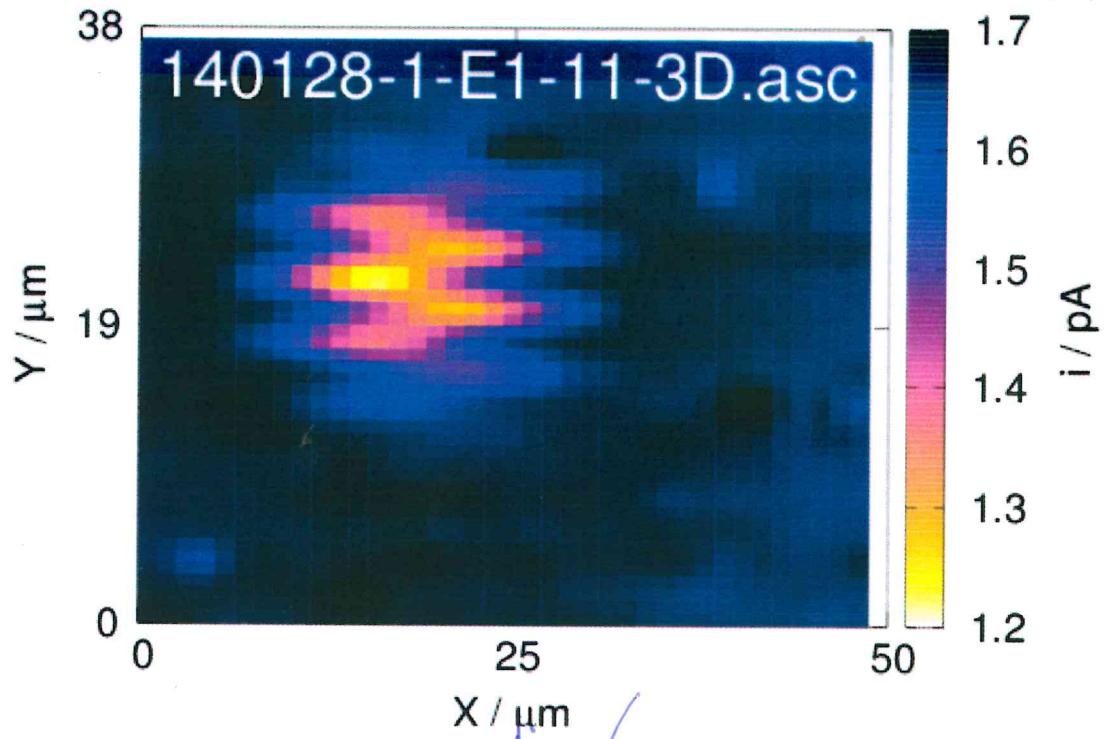
From Page No. _____



$$E_t = (E_0 - E_{\infty}) e^{-Rt/C} + E_{\infty}$$

$$E_t = E_0 + [E_0 - E_{\infty}] \cdot e^{-\frac{t}{RC}}$$

Net voltage waveform - 301 - 311 - 32



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

TITLE (Handwritten)

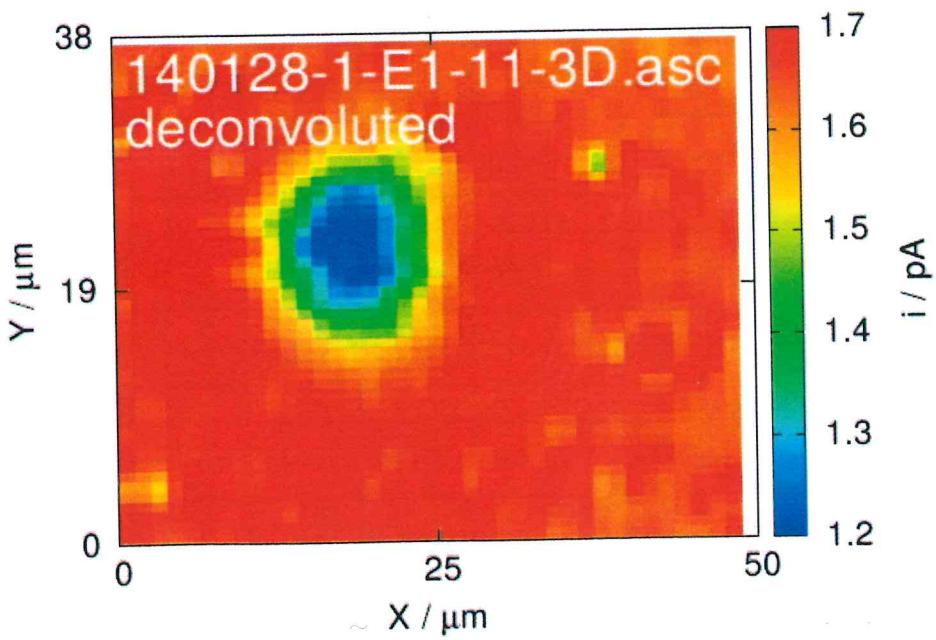
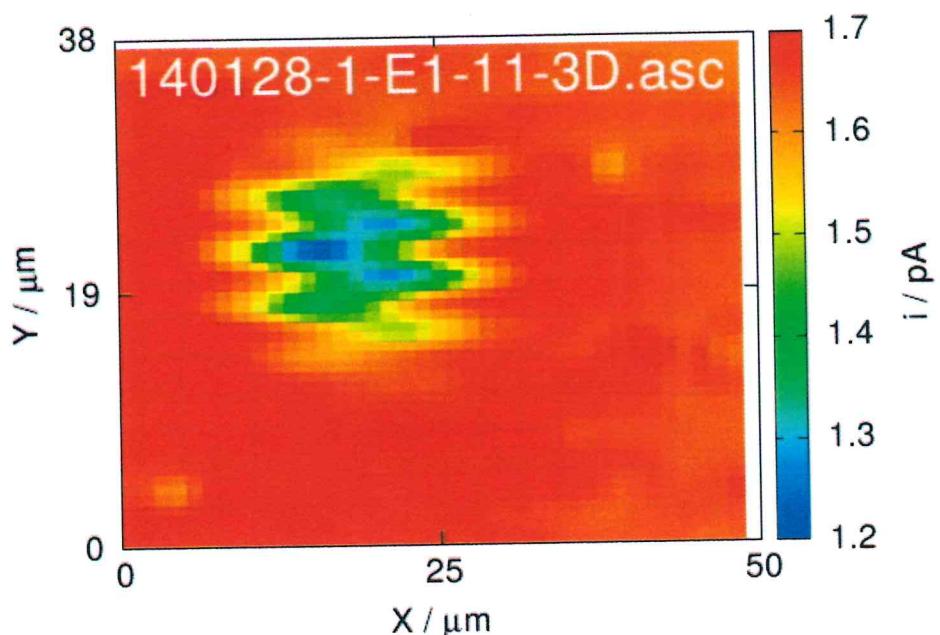
Project No. _____

From Page No. _____

Book No. _____

1) Nernst-equation

$$P_p = \frac{RT}{4\pi} \lg \left(\frac{P_{O_2}}{P_{O_2}^0} \right) + \text{const.}$$



To Page No. _____

Witnessed and understood by me

Date

Invented by

Recorded by

Date

$K_3[Fe(CN)_6]$

Project No. _____

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

TITLE 10 μm Pt disk electrode preparation

Book No. _____

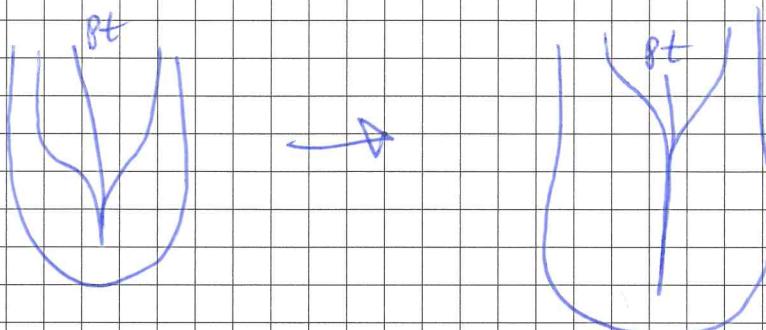
From Page No. _____

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

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

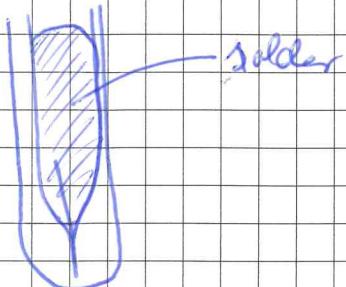
Date

Recorded by

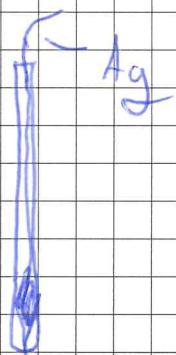
2018.06.20.

HEKA

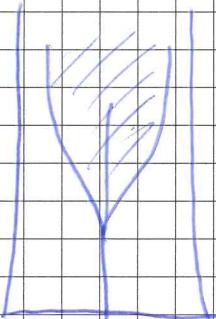
From Page No. _____



Then, while the solder was still molten,
I pushed in an 0.8 cm silver wire
to provide electric connection to the proton-
tintat



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



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

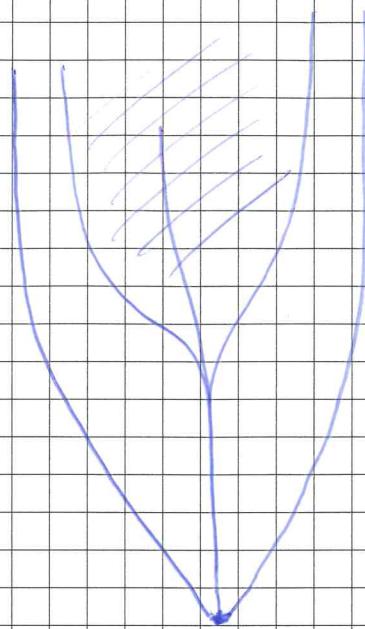
Recorded by

TITLE _____

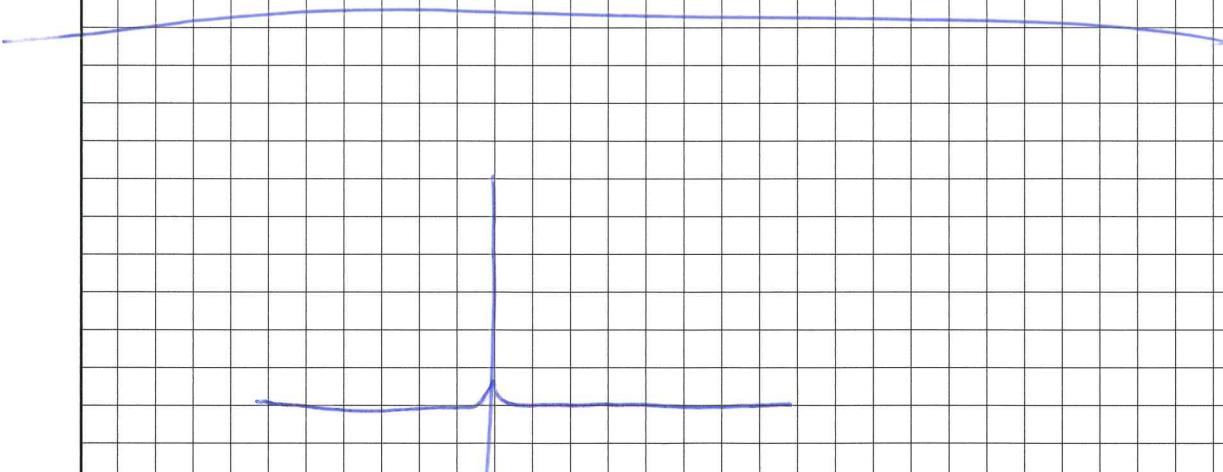
Book No. _____

From Page No. _____

Then, I ground the benzene:



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



To Page No. _____

Witnessed and understood by me

Date

Invented by

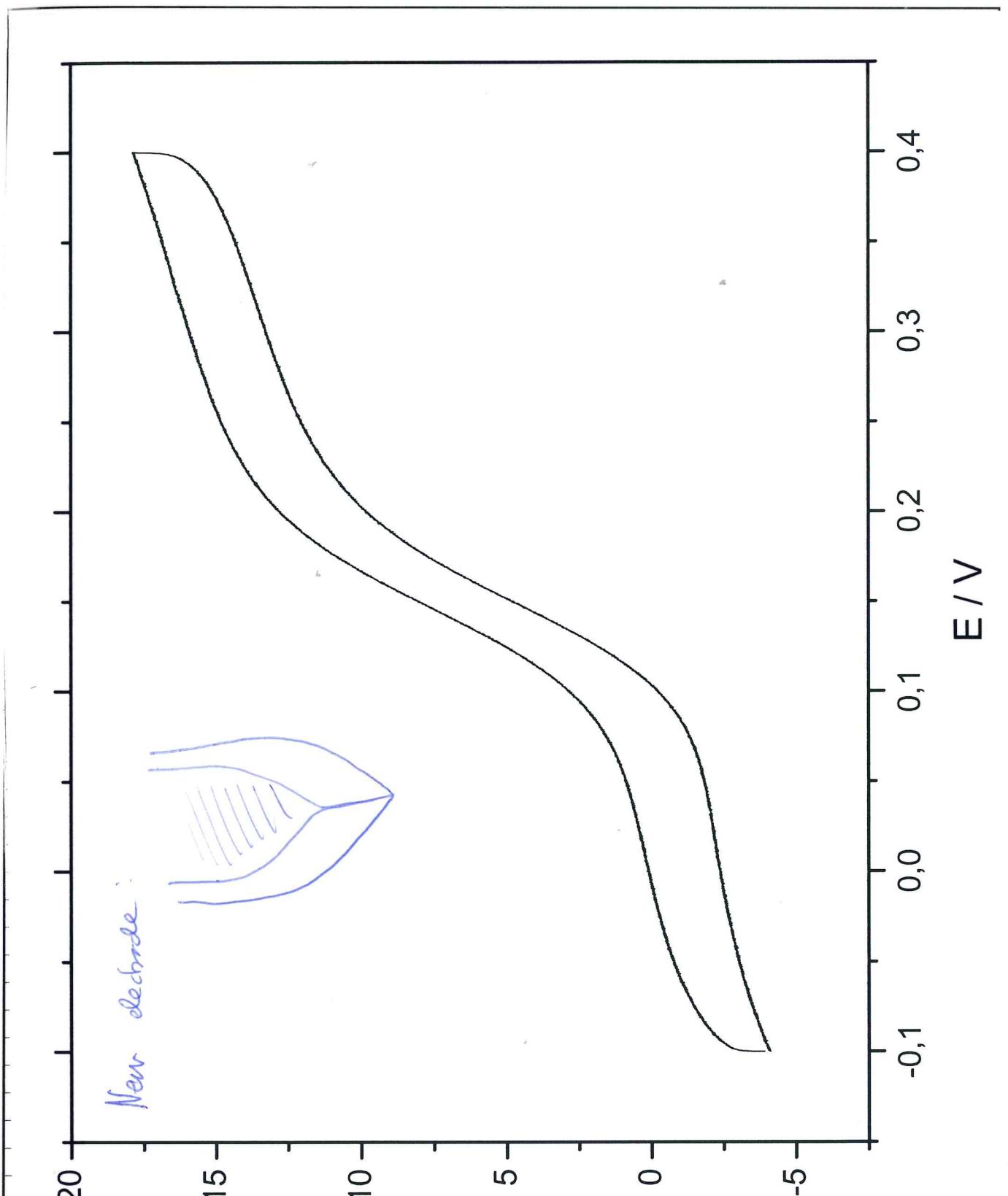
Date

Recorded by

Project No. _____

Book No. _____

TITLE _____



A / D

10 Page No. _____

Witnessed and understood by me

Date

Invented by

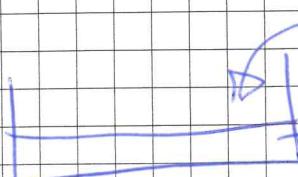
Date

Recorded by

TITLE H_2O_2 chronoamperometric calibration

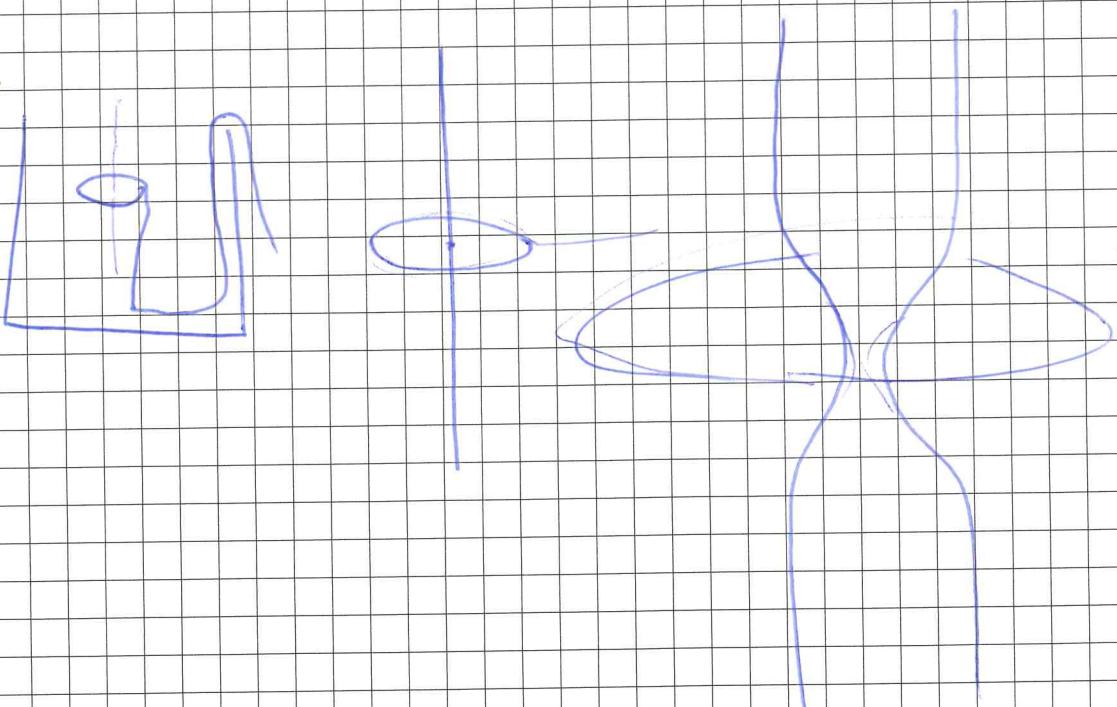
From Page No. _____

With the new electrode.


 10-10 μ l 1mM H_2O_2 stock
 1st 2nd 10mM PBS

increase in H_2O_2 : 5 μ l each addition

24.5°C

 H_2O_2 stock solution prepared by Phillips

To Page No. _____

Witnessed and understood by me

Date

Invented by

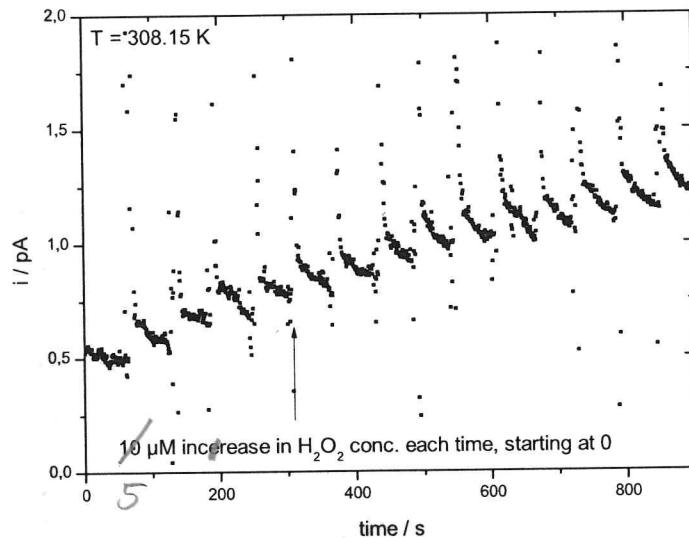
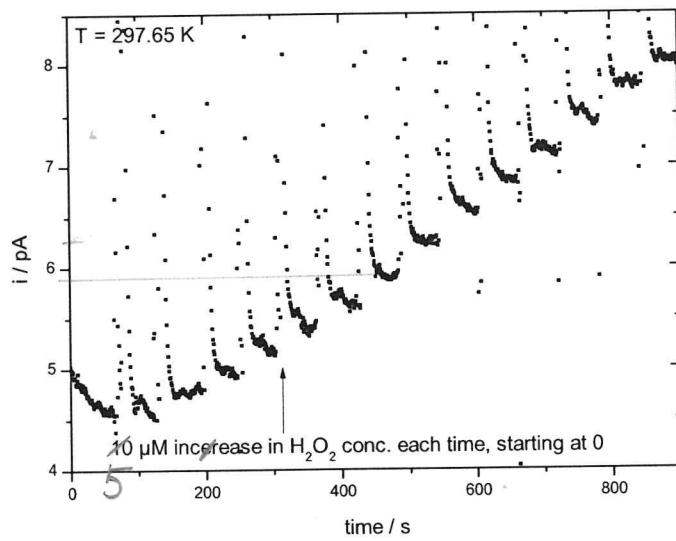
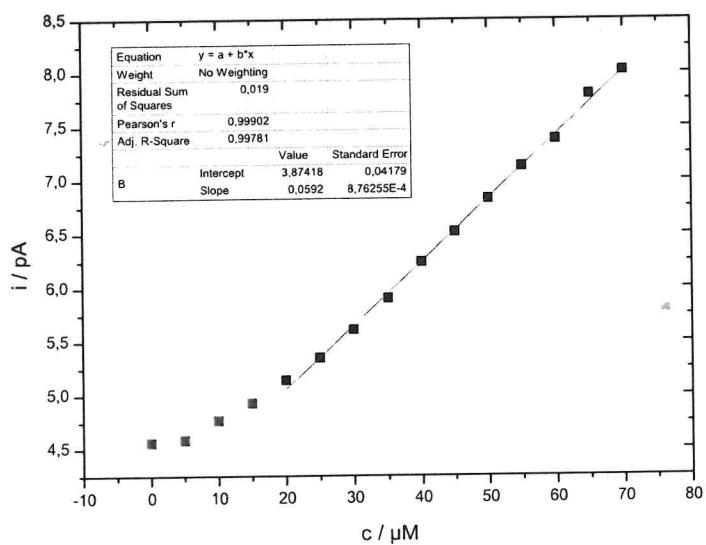
Date

Recorded by

TITLE _____

Book No. _____

From Page No. _____



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Witnessed and understood by me

Date _____

Invented by _____

Date _____

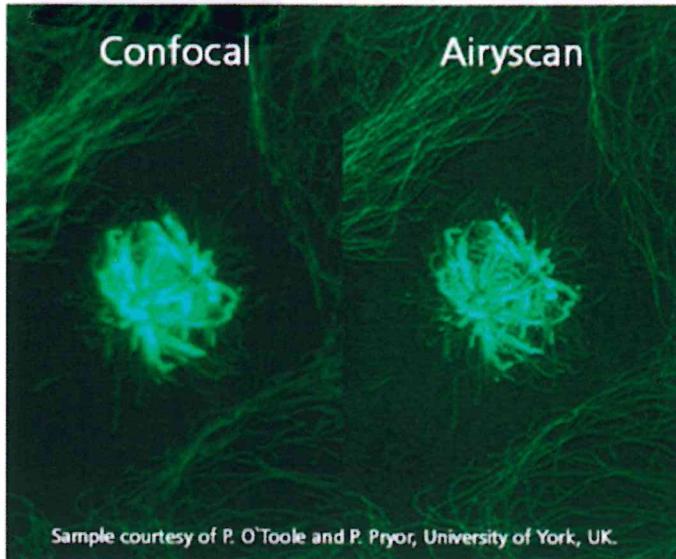
Recorded by _____

Project No. _____

TITLE Zeiss Workshops

Book No. _____

From Page No. _____



Sample courtesy of P. O'Toole and P. Pryor, University of York, UK.

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. _____

Witnessed and understood by me

Date

Invented by

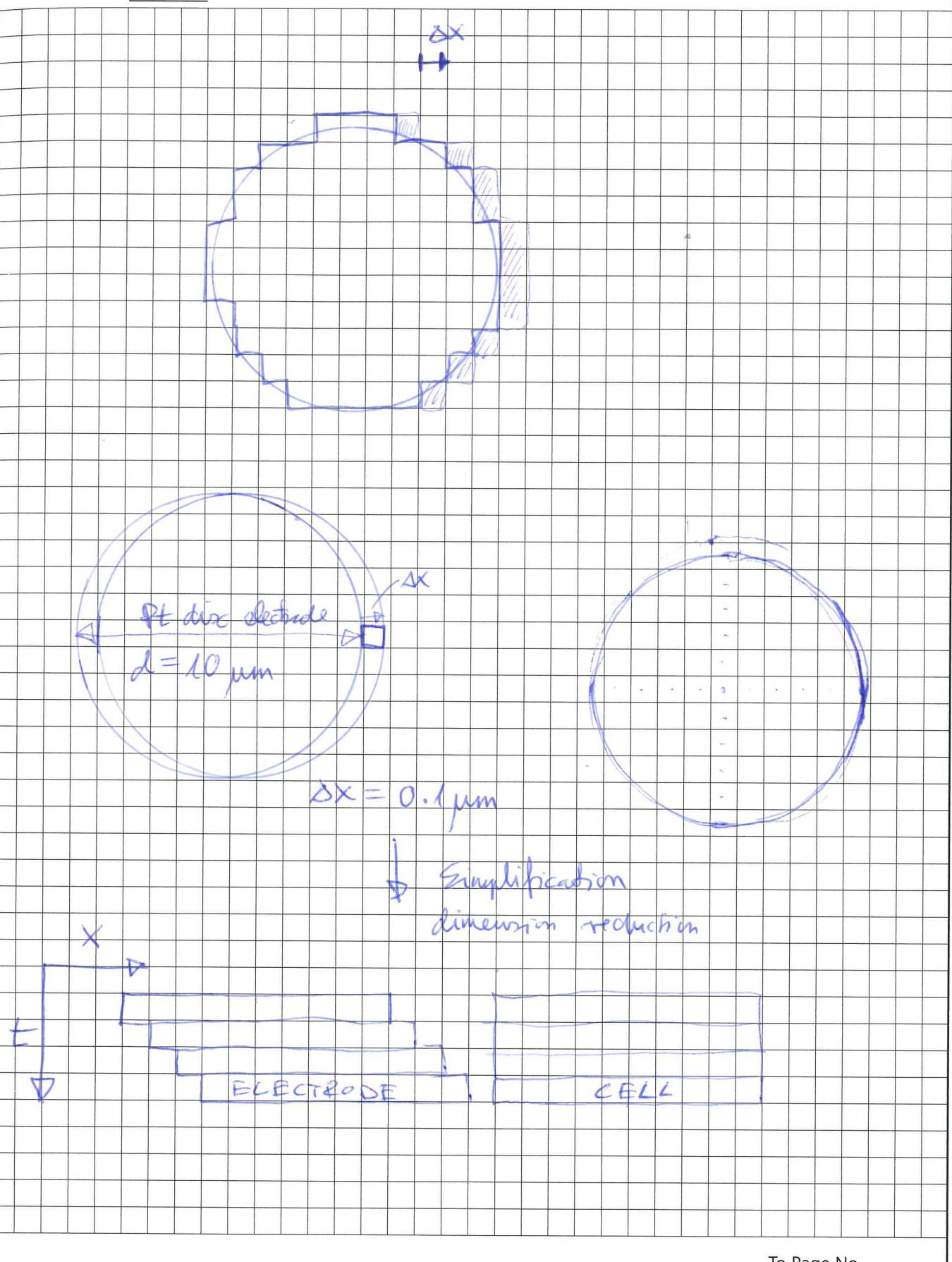
Date

Recorded by

TITLE _____

Book No. _____

From Page No. _____



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

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

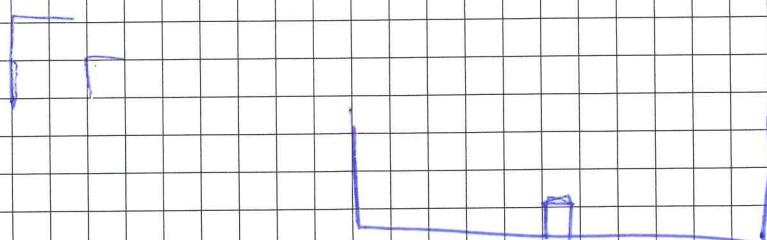
x: 0 - 45 (401 row)

y:

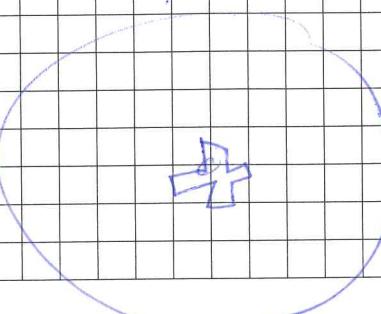
lines in the file: 13026

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

1301

FO
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

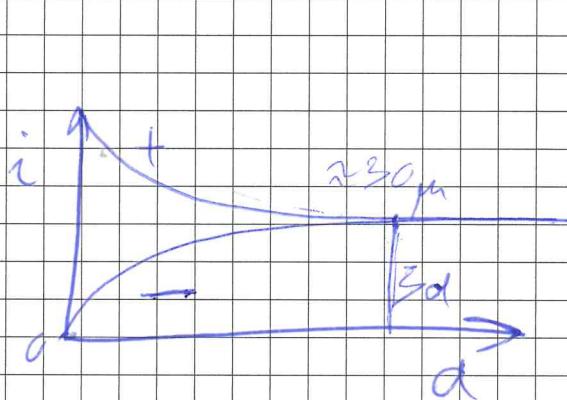
TITLE _____

Book No. _____

From Page No. _____

M1

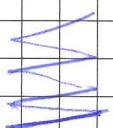
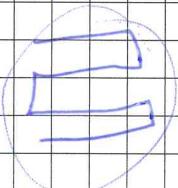
18626-1.dat



cell attached to UVE and dragged along another during the scan

E1-11-4

0.5 mM TPA
+ 5 μl to 2 ml



1 μM TPA for the cells
in DMSO

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

From Page No. _____

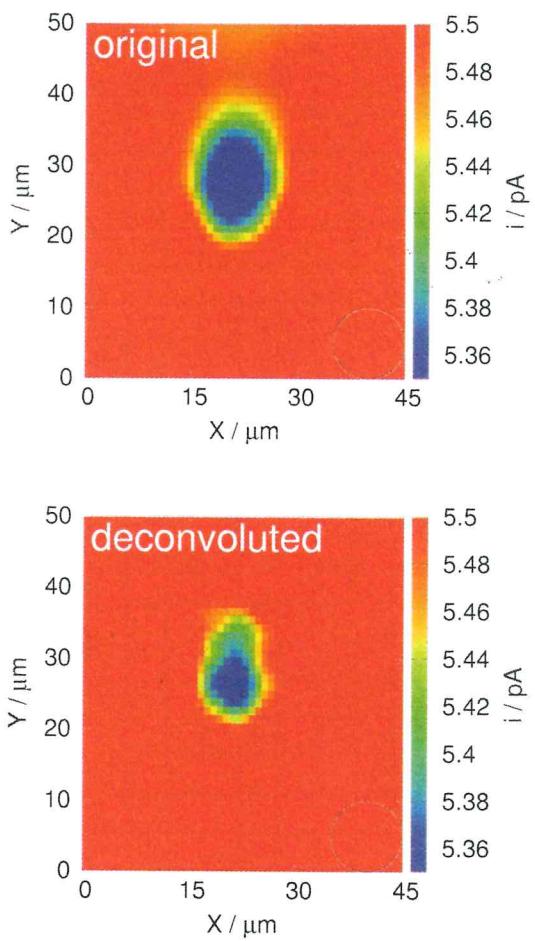


Figure 1

Witnessed and understood by me

Date

Initial
Record

Fluorodis™
WORLD PRECISION INSTRUMENTS, INC.
Tel: 941-337-5268
Fax: 941-337-5263
www.wpiinc.com

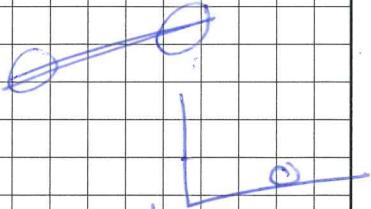
TITLE 180627 New cell experiment

From Page No. _____

1, Wash cell culture 2ml PBS



fibronectin
+
cells



Put 2ml PBS in



2, Place electrodes

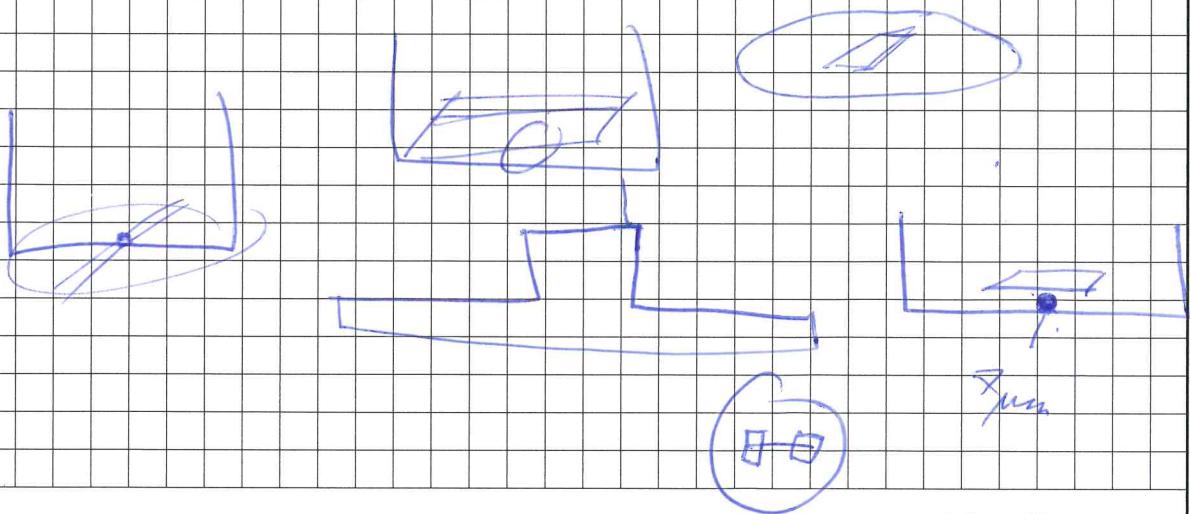
3, Load for cells (jyostic mode)

4, Set origin

5, clean electrode 970 pA mV (-70 pA)

for fan records

1 μM 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 $\mu\text{m} \times 1 \mu\text{m}$, stepwise

51 \times 51 μm^2 0 - 50

5:



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

meander

6:

best not for
2 electrode

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

51 \times 51

7:

even better

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



start photo: 007

8:

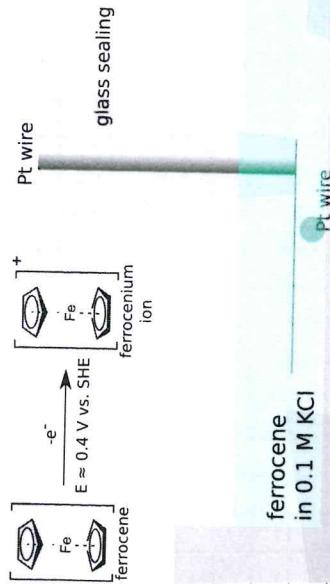


electrode focus: 5.85 μm
wire edge focus: -3.82 μm

ϕ 20 μm Pt

start: 010

stop: 011



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

180627

Recorded by

TITLE Image of broken microscope slide cover Book No. _____

From Page No. _____

ZnM ferrocene in 0.1M KCl



E1-2 - 50x70 $\mu\text{m} \times \mu\text{m}$ 10 $\mu\text{m}/\text{s}$ meander
- 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 — m meander 50 $\mu\text{m}/\text{s}$

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

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

E1-12: finish: 076

E1-17: finish: 8

E1-32: finish 13

5 $\mu\text{m}/\text{s}$
101x101
1 $\mu\text{m} \times 1 \mu\text{m}$ res.

E1-33: finish 14

40x101 To Page No. _____

201 Date

Witnessed and understood by me

Date

Invented by

1x1

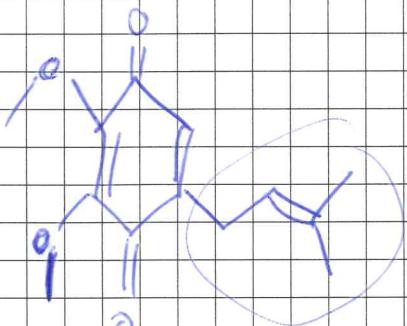
Date

180628 Recorded by

From Page No. _____

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

(Valentin Mirceski (SMM)
Lovic was his supervisor)

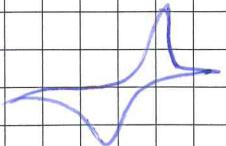
Coenzyme Q₁₀

decylubiquinone

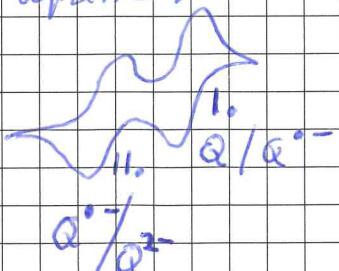
Coenzyme Q₁₀

apotic \rightarrow non-proton donating solvent

apotic solvent:



apotic:



- authors: SVW \rightarrow SWV
- activity instead of conc.
temp?

To Page No. _____

Witnessed and understood by me

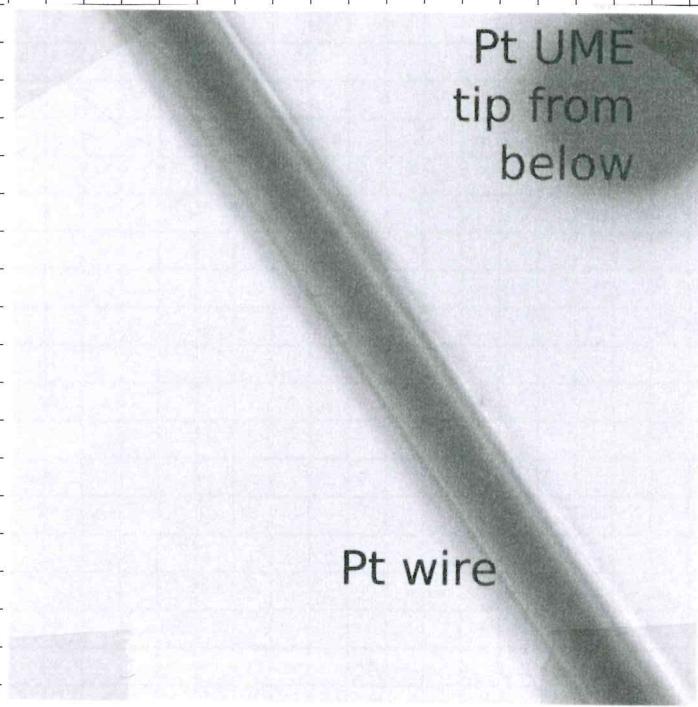
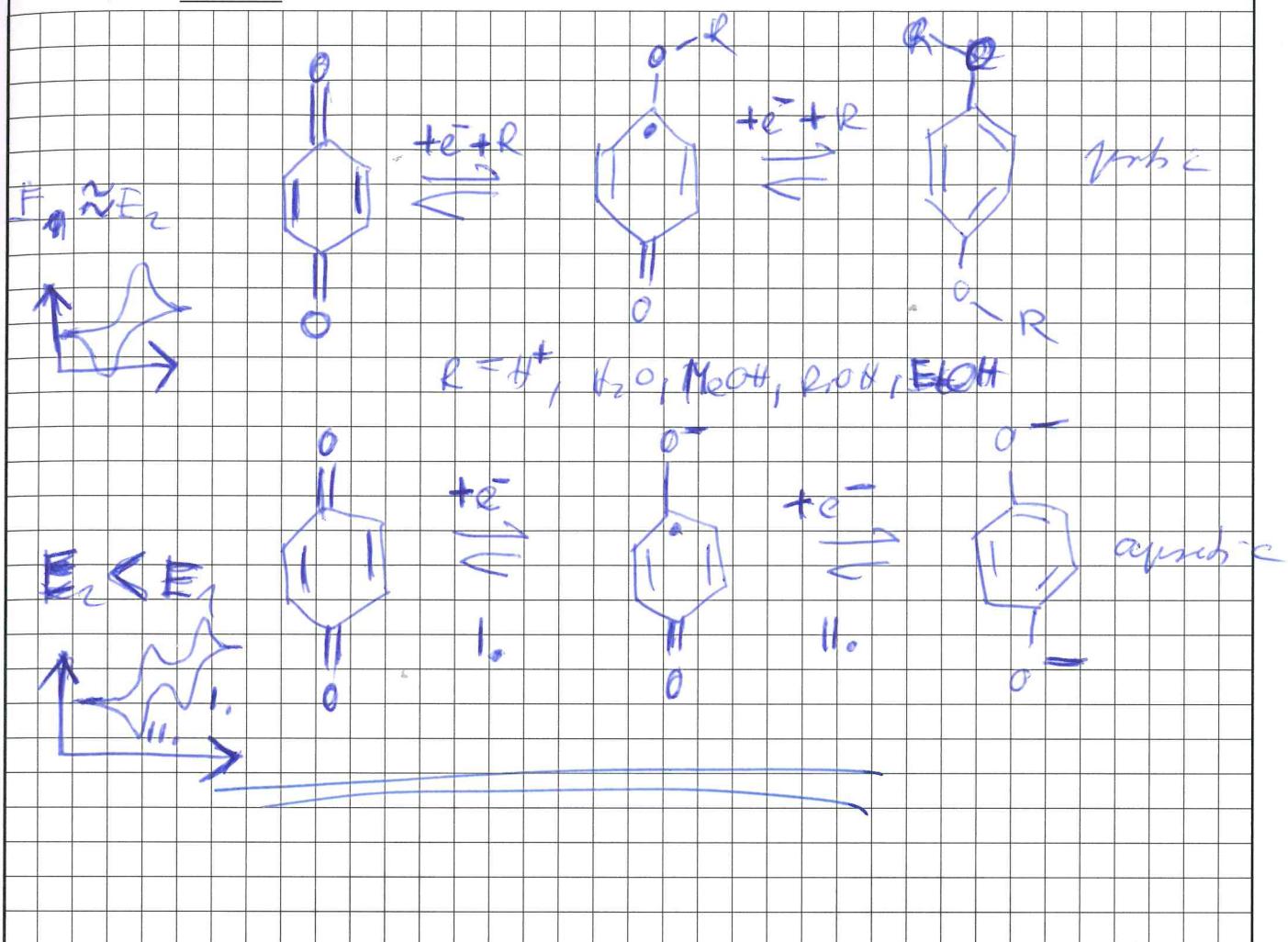
Date

Invented by

Date

Recorded by

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referred to on page 19

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Witnessed and understood by me

Date

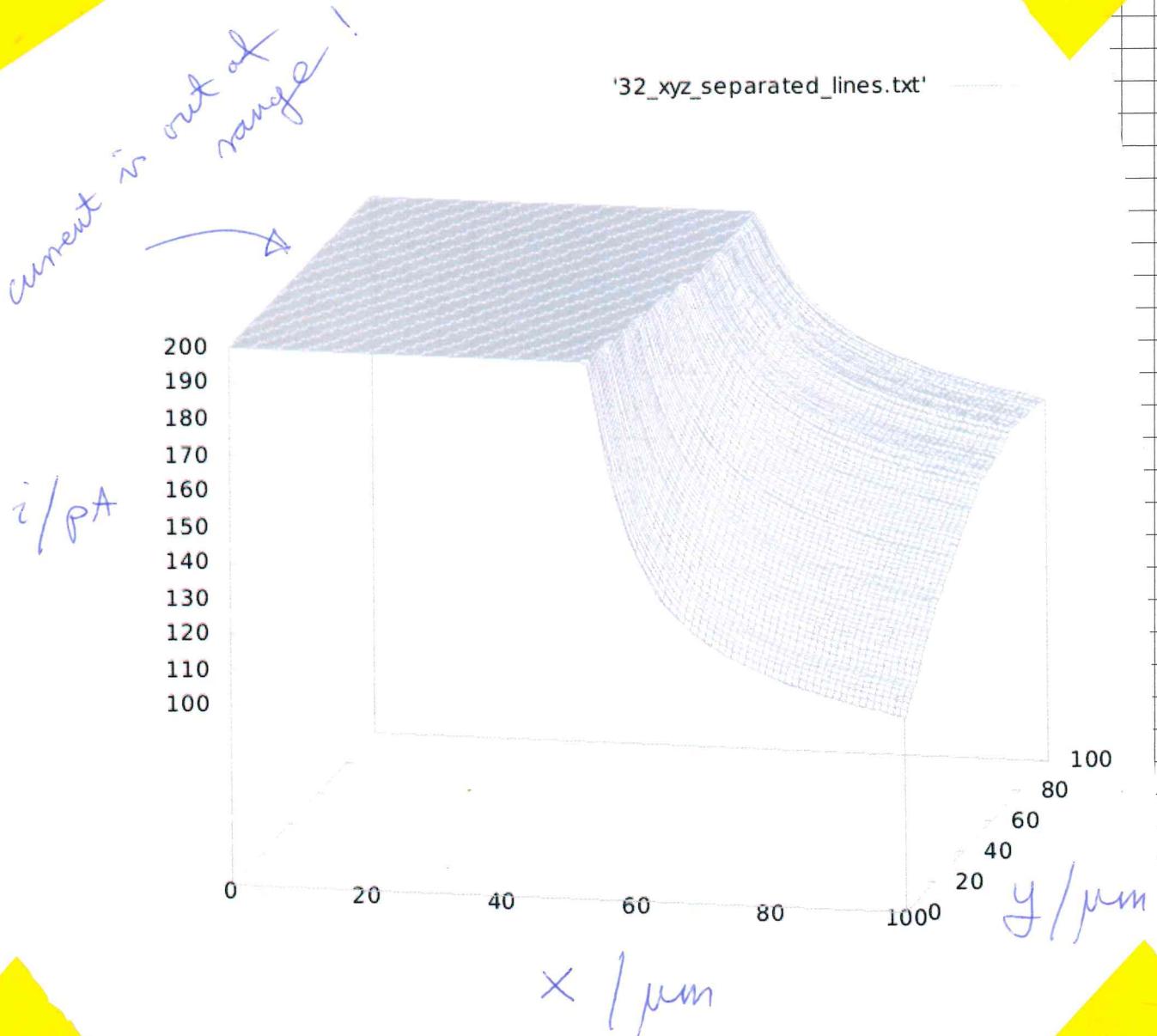
Invented by

Date

Recorded by

From Page No. _____

'32_xyz_separated_lines.txt'



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

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

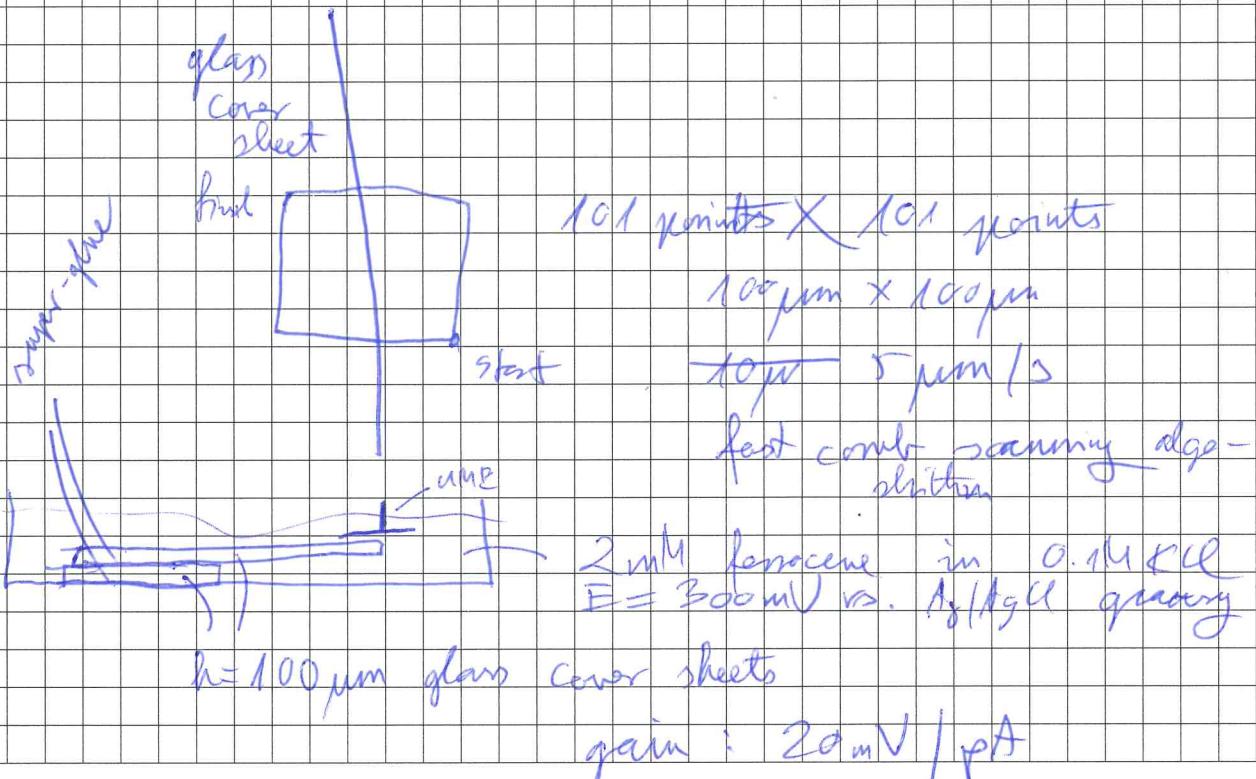
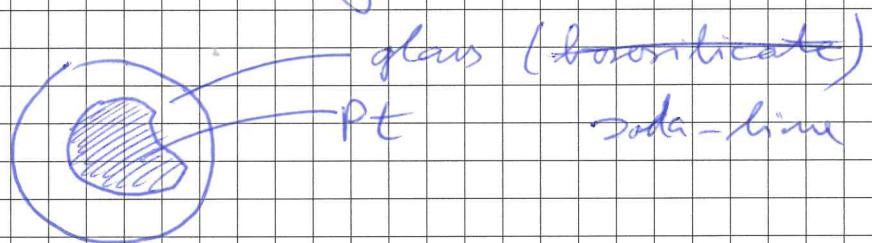
Recorded by

TITLE Soda-lime glass pulling

From Page No. _____

Sutter Instrument P-1000

Program 88

180704. Scanning with electrode #8 prepared
yesterday

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

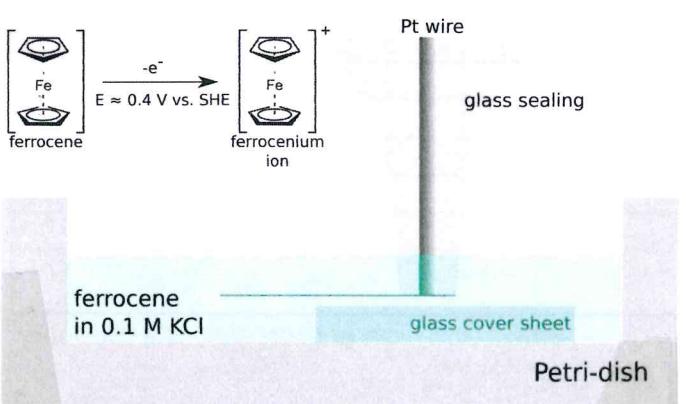
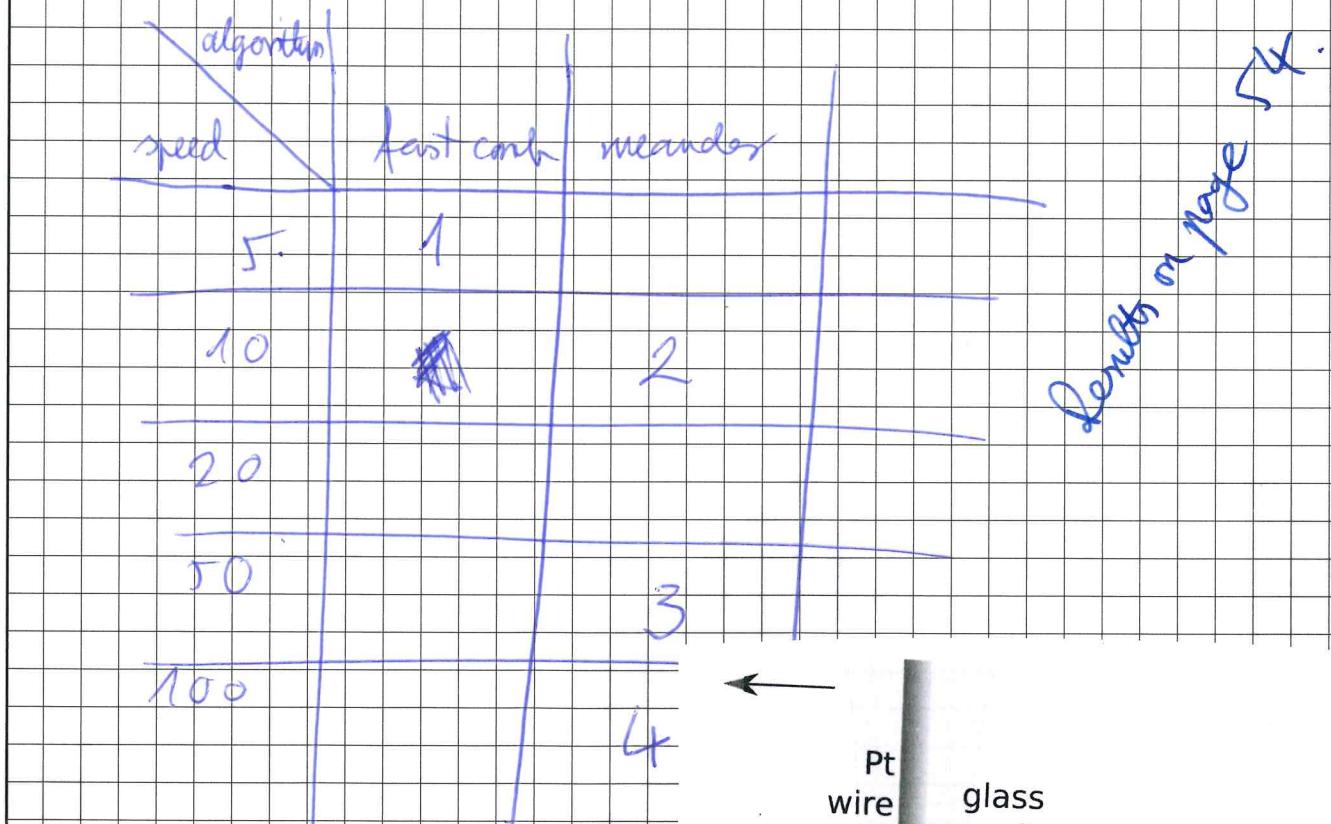
joints: Cell 180704-003.TIF

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

- 18070406/E1-2

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

meander



current

time distance

TITLE Autoway microelectrode tests

Book No. _____

From Page No. _____

Normal instruments

pH meter

pH 211

(phosphate)

microprocessor pH meter

~~E/mV pH~~

4

7

-200

-330 mV

80mV / 3

26 mV / pH

Buffers were kindly
provided by Katerina.

pH

E/mV

E/mV

4

-210

-368

7

-330

7

-377

4

-260

117 / 3

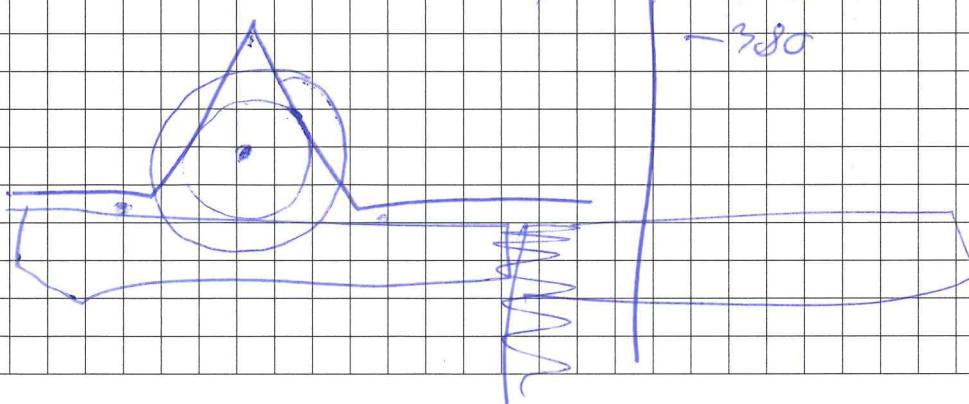
4

-262

39mV / pH

7

-380



To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE Writing a script to fix the meander algorithm

From Page No. _____

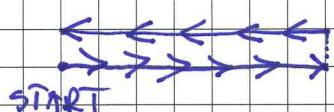
Problem :

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

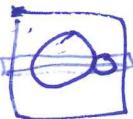
Invented by

Recorded by

Date

180705

HECA



Project No. _____

TITLE _____

Book No. _____

From Page No. _____

fc2m.sh "Fast coil 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 "$option" in
in
u) USR=$OPTARG;;
d) DST=$OPTARG;;
:
esac
done
```

→ finished script on next page!

To Page No. _____

Witnessed and understood by me

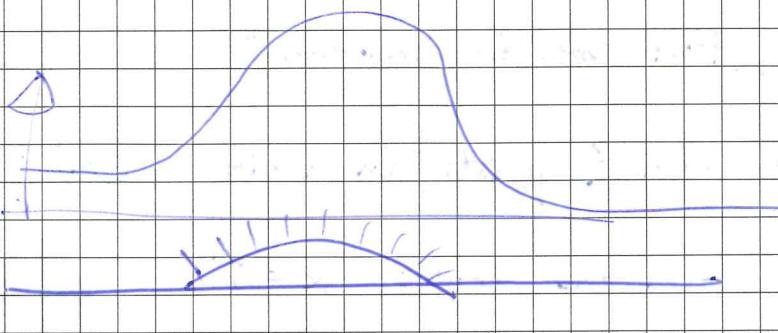
Date

Invented by

Date

Recorded by

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. _____

~~antimony powder~~ Borosilicate glass

P-1000 borosil glass

180710

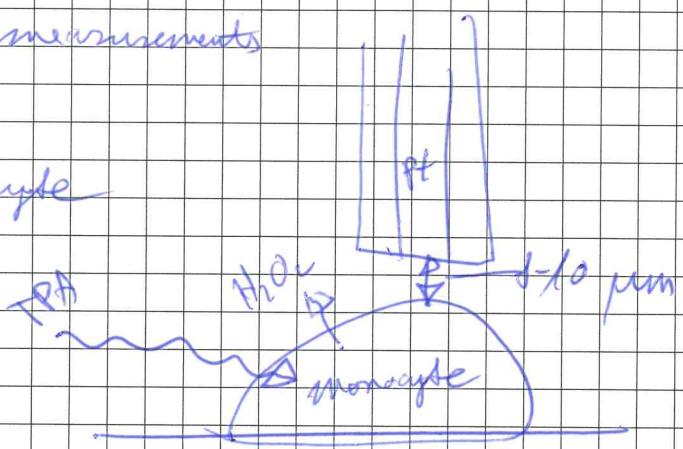
H₂O₂ measurements

above monocyte

E = 650 mV

50 μm / 50 μm

2 μm / 2 μm



180710-1. dat

1. 3D-scan: fast calc 5 μm/h

2. meander 10 μm/h

plate mixed

To Page No. _____

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Date

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180709

TITLE Testing antimony microelectrodes prepared yesterday

Book No. _____

From Page No. _____

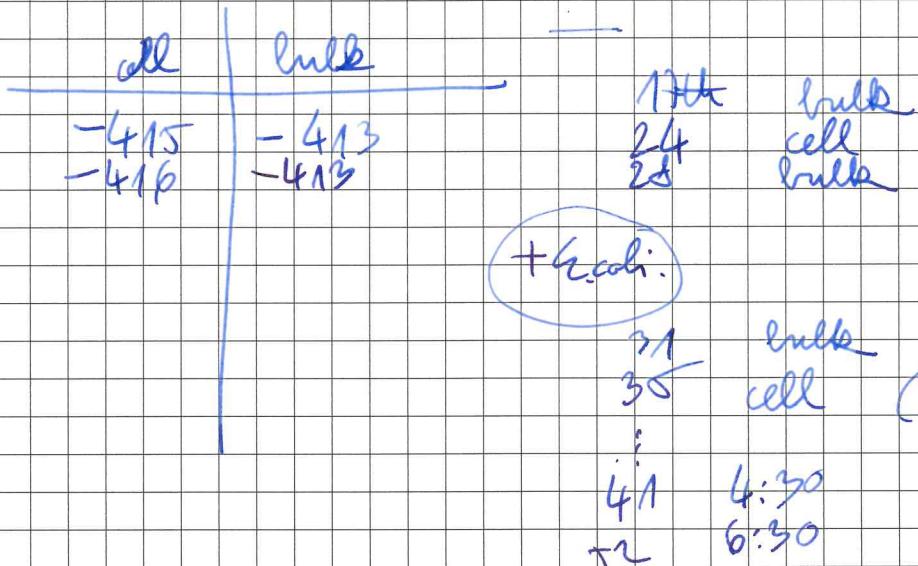
$E @ pH=7 PBS$ (mV)

- | | |
|----|---------|
| 1 | — |
| 2 | -403.16 |
| 3 | -394 |
| 4 | -378 |
| T | -368 |
| 6 | -350 |
| 7 | -350 |
| 8 | -350 |
| 9 | -358 |
| 10 | -357 |

9/10



62 pixel = 10 μm (40X)



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

To Page No. _____

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Date

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Date

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Project No. _____

Book No. _____

TITLE Attempting to image yeast cell CO₂ output

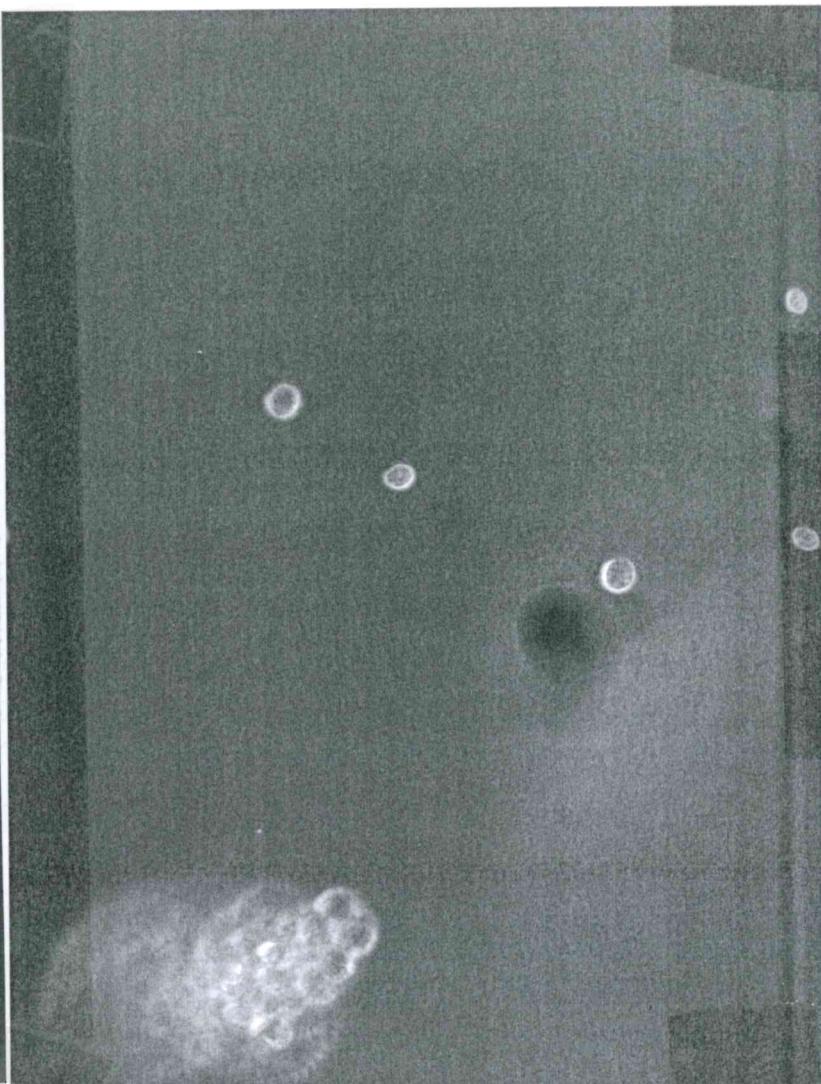
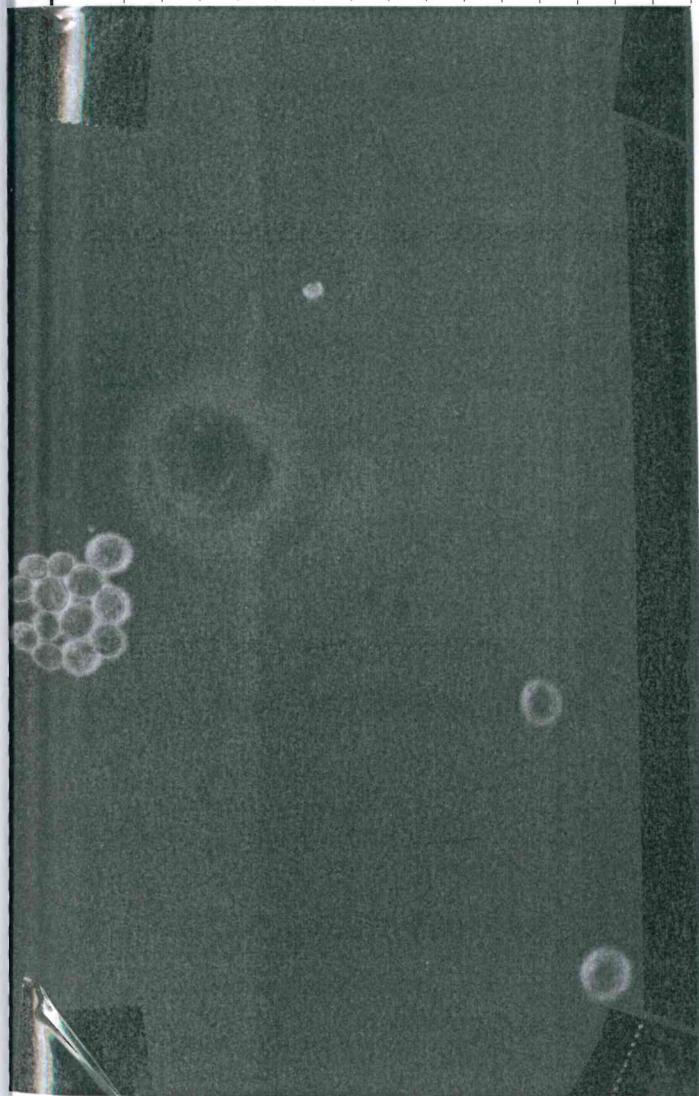
From Page No. _____

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.)



.....and understood by me

Date

Recorded by

Date

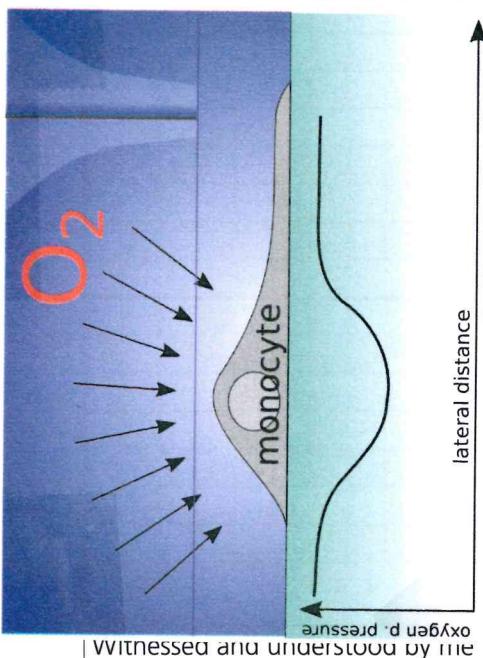
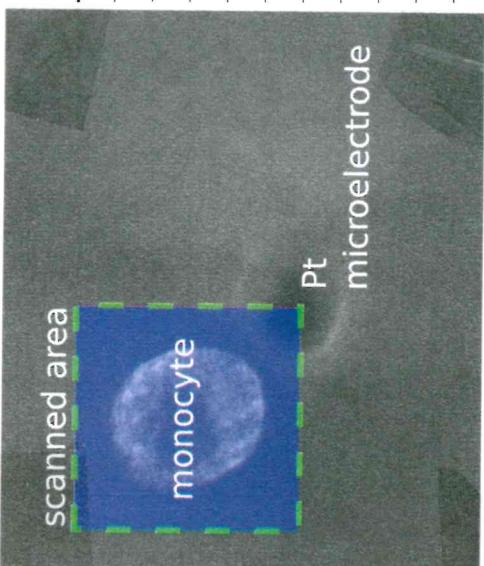
TITLE Masuring oxygen above the human monocytes

From Page No. _____

180716-01

E1 - ?

incomplete



all the numbers and dates
written and understood and witnessed

Monocytes 6 days old

$100\text{ }\mu\text{m} \times 100\text{ }\mu\text{m}$ area

101×101 points



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

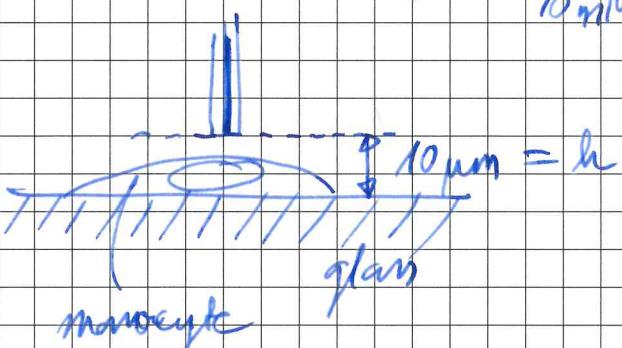
$10\text{ }\mu\text{m}/\text{s}$ scanning speed
meander algorithm
electrode #8



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

(dissolved oxygen in

medium + electrolyte: PBS
10 mM glucose



To Page No. _____

Date

180716

Invented by

Recorded by

Date

TITLE _____

Book No. _____

From Page No. _____

E1 - 3

 $40\text{ }\mu\text{m} / 40\text{ }\mu\text{m}$ 41×41 $5\text{ }\mu\text{m/s}$ meander e^{-t}

incomplete

start: 3

finish: 4

(Cell 180216_003.TIF)

E1 - 4

 $40\text{ }\mu\text{m} \times 40\text{ }\mu\text{m}$ 41×41

incomplete

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

E1 - 5

 $40\text{ }\mu\text{m} \times 40\text{ }\mu\text{m}$ 41×41 $h = 3.15\text{ }\mu\text{m}$ $10\text{ }\mu\text{m/s}$ meander

E2 - 1

 $60\text{ }\mu\text{m} \times 60\text{ }\mu\text{m}$ 61×61 $0.7\text{ }\mu\text{m/s}$ fast comb

neur cell

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

E2 - 8

 $x \quad y$ 40×40 801×41

fast comb

 $1\text{ }\mu\text{m/s}$ 40×40 401×41

meander

 $10\text{ }\mu\text{m/s}$ E2 - 10 - 11 -
 $20\text{ }\mu\text{m/s}$ meander

E2 - 9

Only $\rightarrow 401$, because it's 10 times

To Page No. _____

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Date

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faster

E2 - 11 - v

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

HEKA

E2 - 12 - v
 $0.5\text{ }\mu\text{m/s}$
fast comb

TITLE continued from previous page

From Page No.

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

1 (E2-13)

5 E2-8

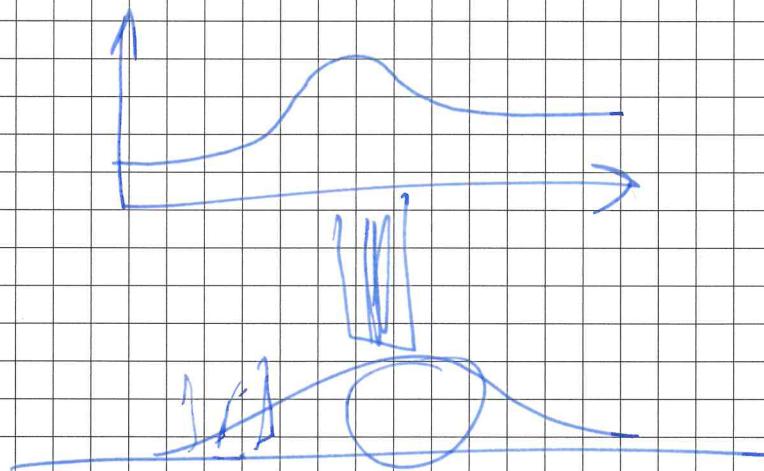
10 E2-9

20 E2-10

50 E2-11

+ step response? 

cell dead: E2-15



To Page No. _____

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Recorded by

From Page No. _____

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

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

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

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

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

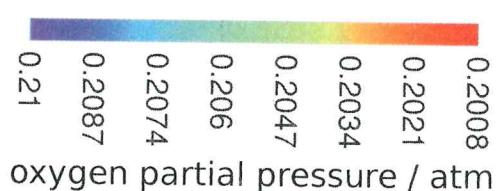
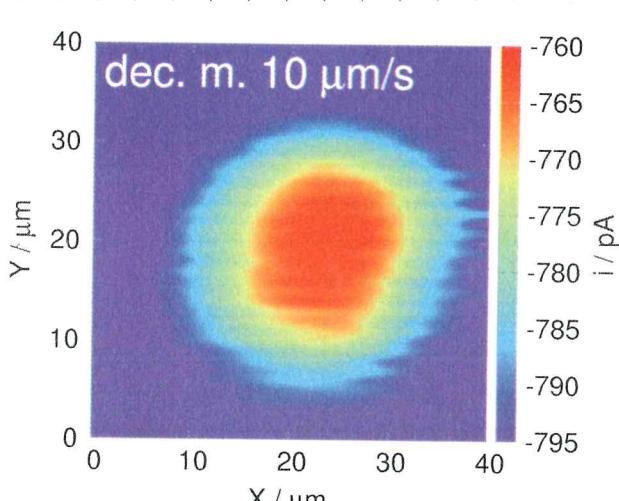
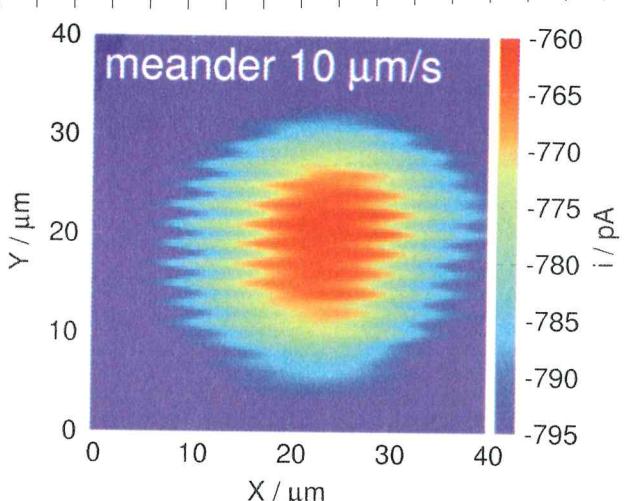
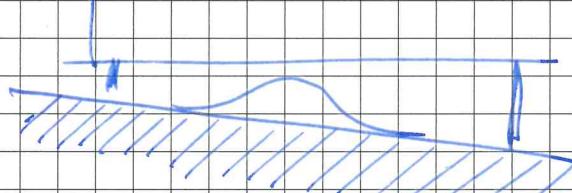
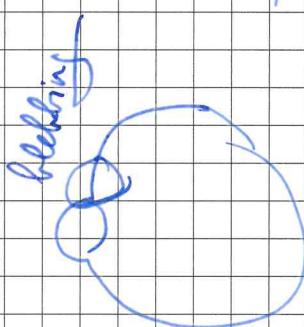
$$2 \cdot 10^{-5} \text{ mol}$$

$$2 \mu\text{mol} \text{ in } 0.002 \text{ dm}^3$$

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

$$\frac{1}{2}$$

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



E2-9

From Page No. _____

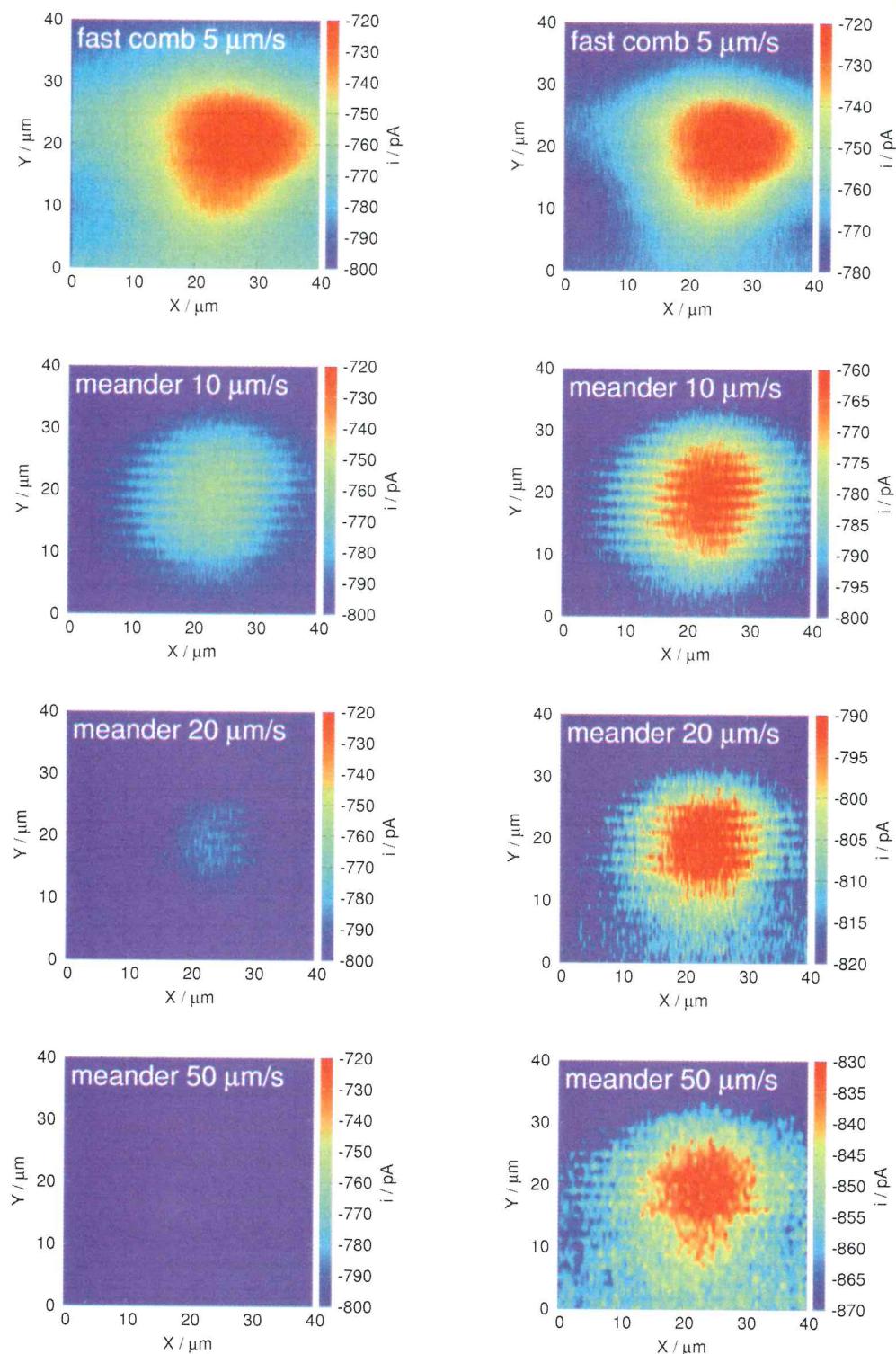


Figure 1: Oxygen reduction current above a human monocyte at $h = 10 \mu\text{m}$ relative to the glass bottom of the Petri-dish. Working electrode: $d = 10 \mu\text{m}$ Pt UME. $\text{RG} \approx 2.5$. $E = -700 \text{ mV}$ vs. Ag/AgCl quasi-reference electrode. Medium/electrolyte: PBS + 10 mM glucose.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

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Recorded by _____

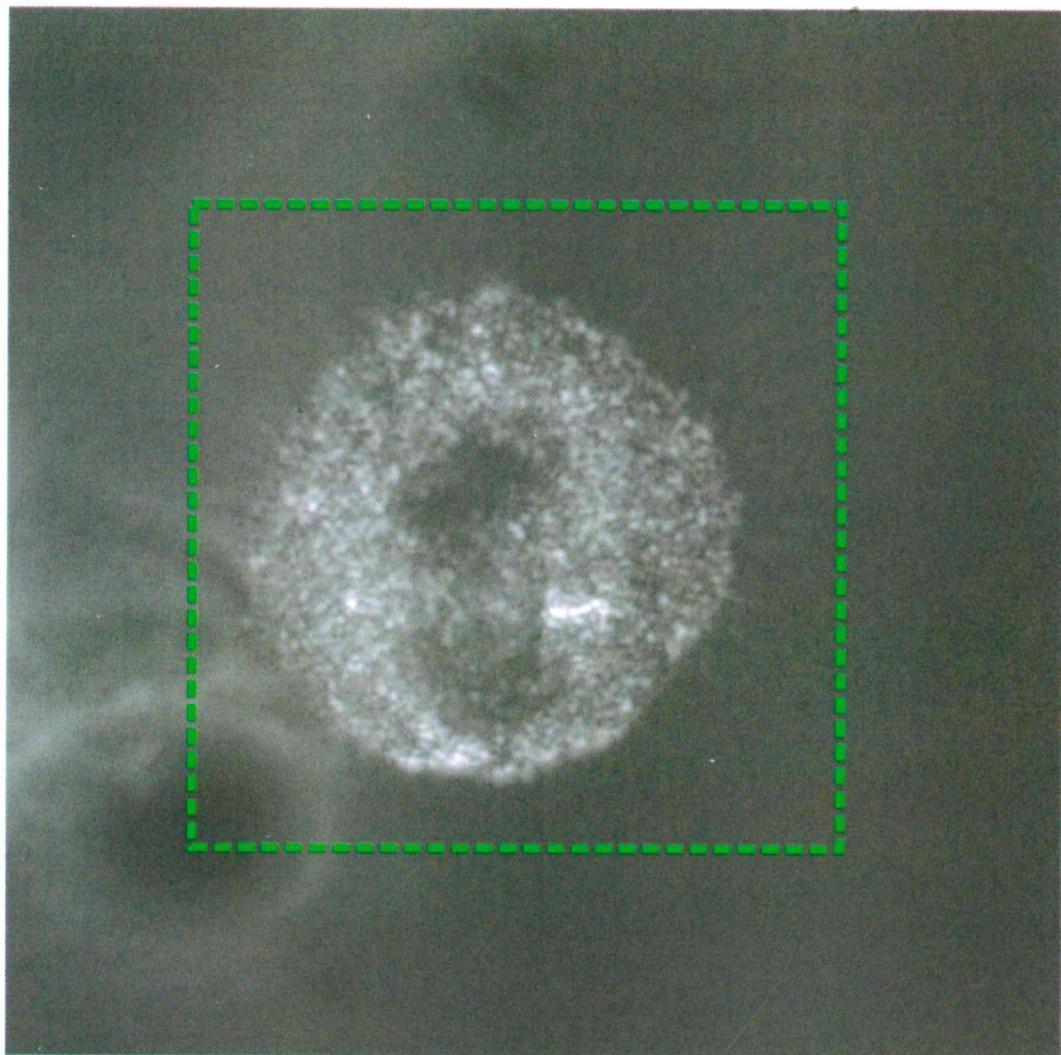
Date _____

Project No. _____

TITLE _____

Book No. _____

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Date

Recorded by

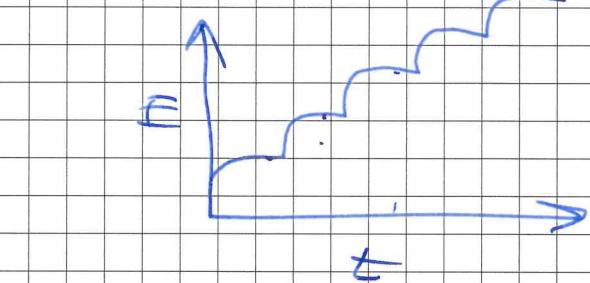
From Page No. _____

1, Create pH = 6, 6.5, 7, 7.5 & 8.5 of buffer

real pH 6.06 6.57 7.06 7.5 8.03 8.42
PPS -293.1 -318 -344 -364 -388 -403

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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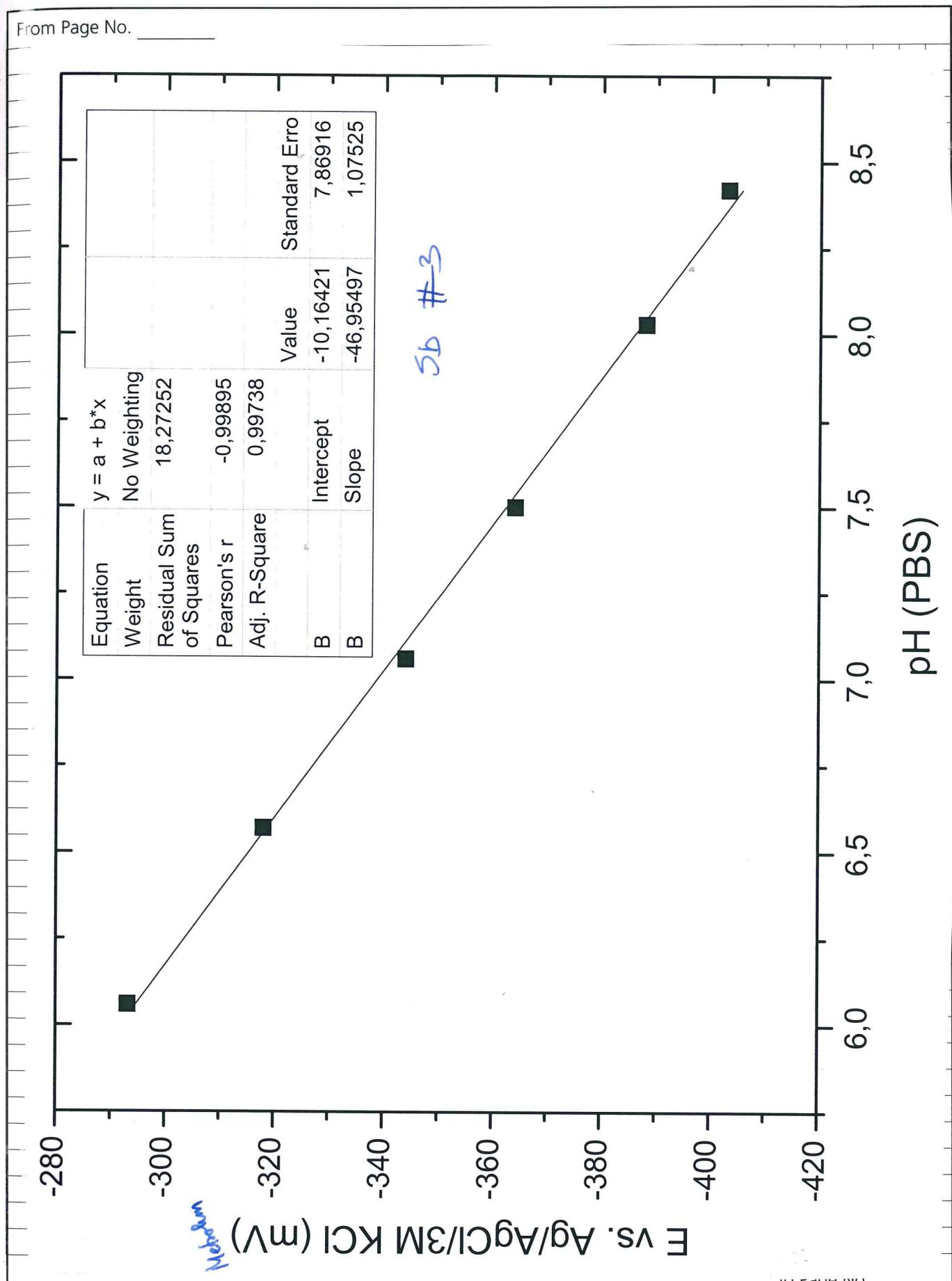
Date

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Date _____

Recorded by _____

On page of _____

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pH	$E(\text{mV})$ vs Ag/AgCl quan-xf. (chlorinated silver wire)
6.06	-315
6.57	-336
7.06	-318
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 electrode.

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

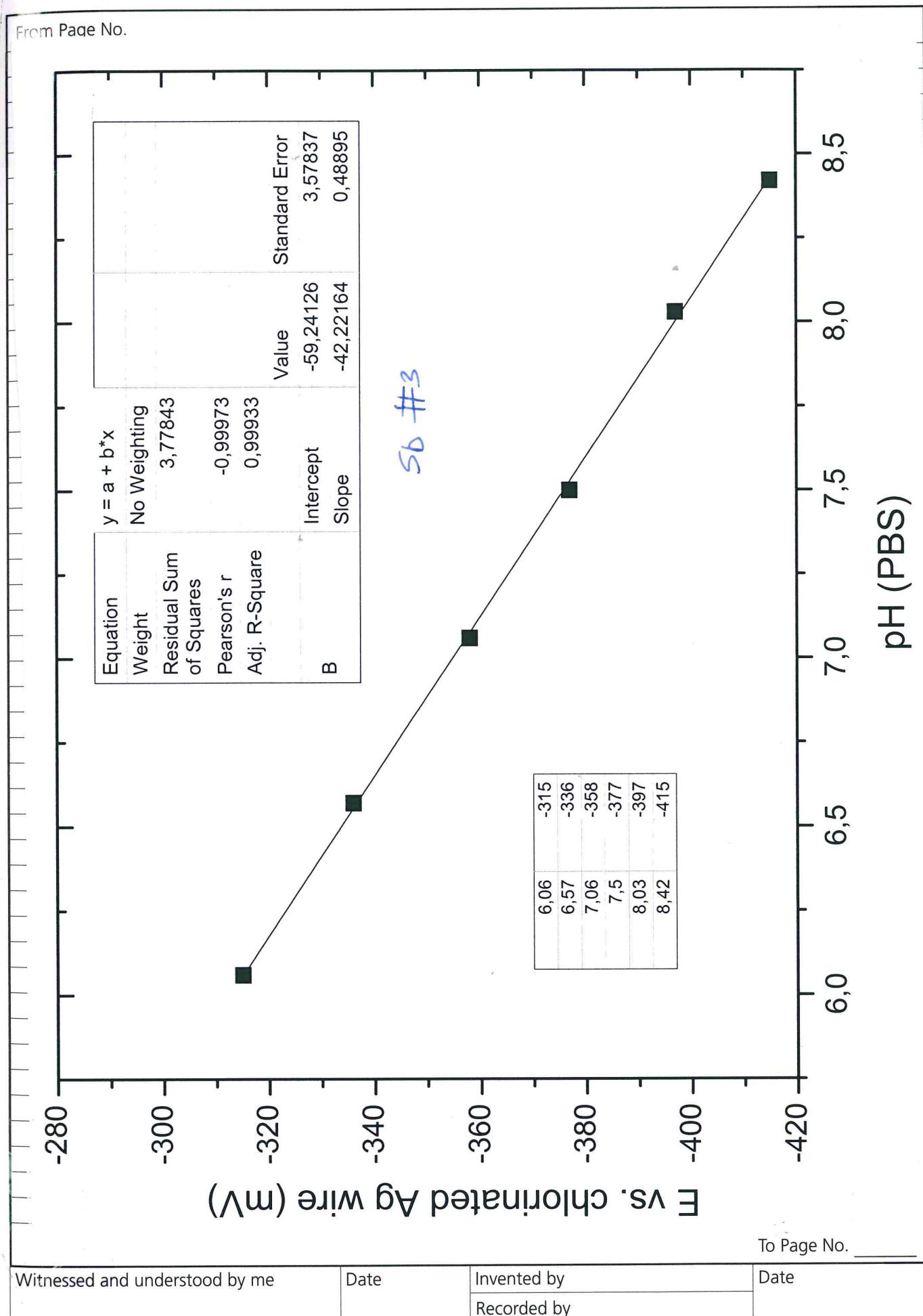
The minor difference in $a\text{Cl}^-$ of the buffers doesn't seem to effect the response noticeably.

To Page No. _____

Witnessed and understood by me	Date	Invented by	Date
		Recorded by	

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Date _____

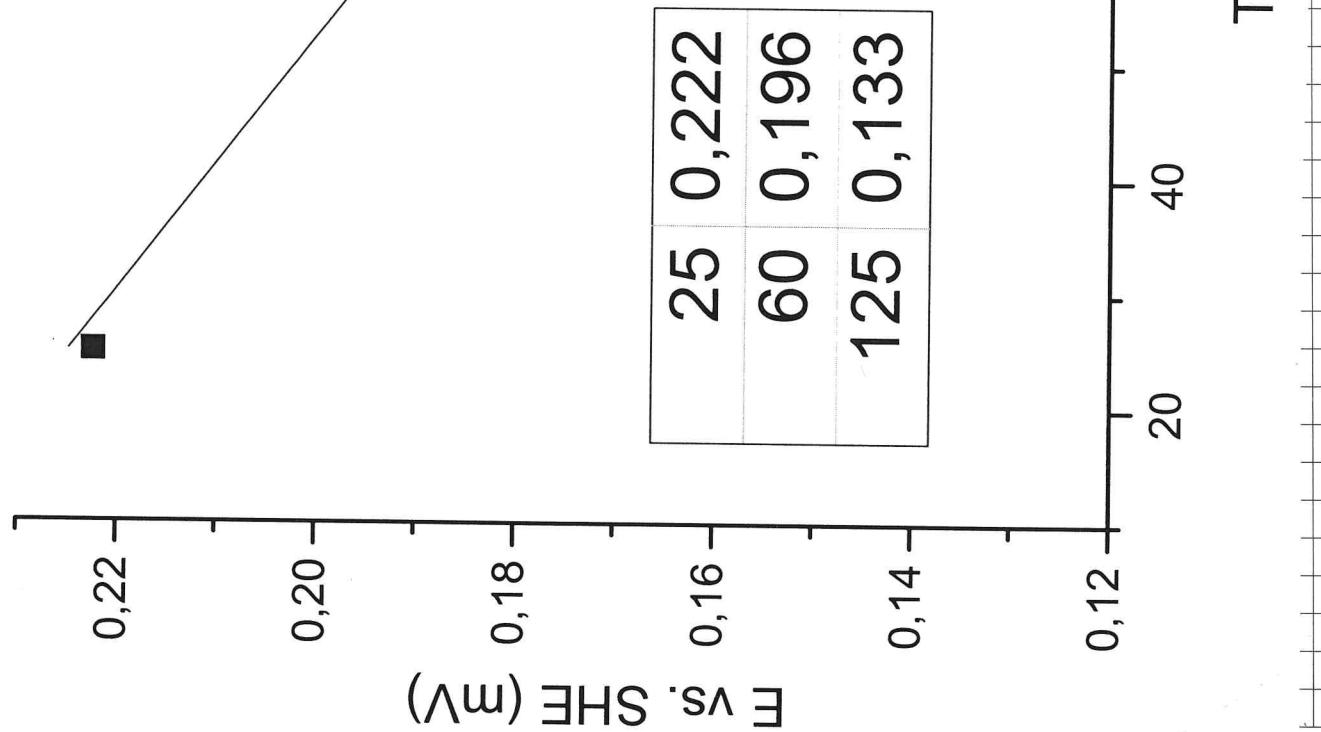
Invented by _____

Date _____

Recorded by _____

From Page No.

Equation	$y = a + b*x$
Weight	No Weighting
Residual Sum of Squares	2,12919E-5
Pearson's r	-0,99748
Adj. R-Square	0,98994
B	
Value	
Intercept	0,24735
Slope	-9,04437E-4
Standard Error	
	0,00523
	6,429989E-5



Witnessed and understood by me

Date

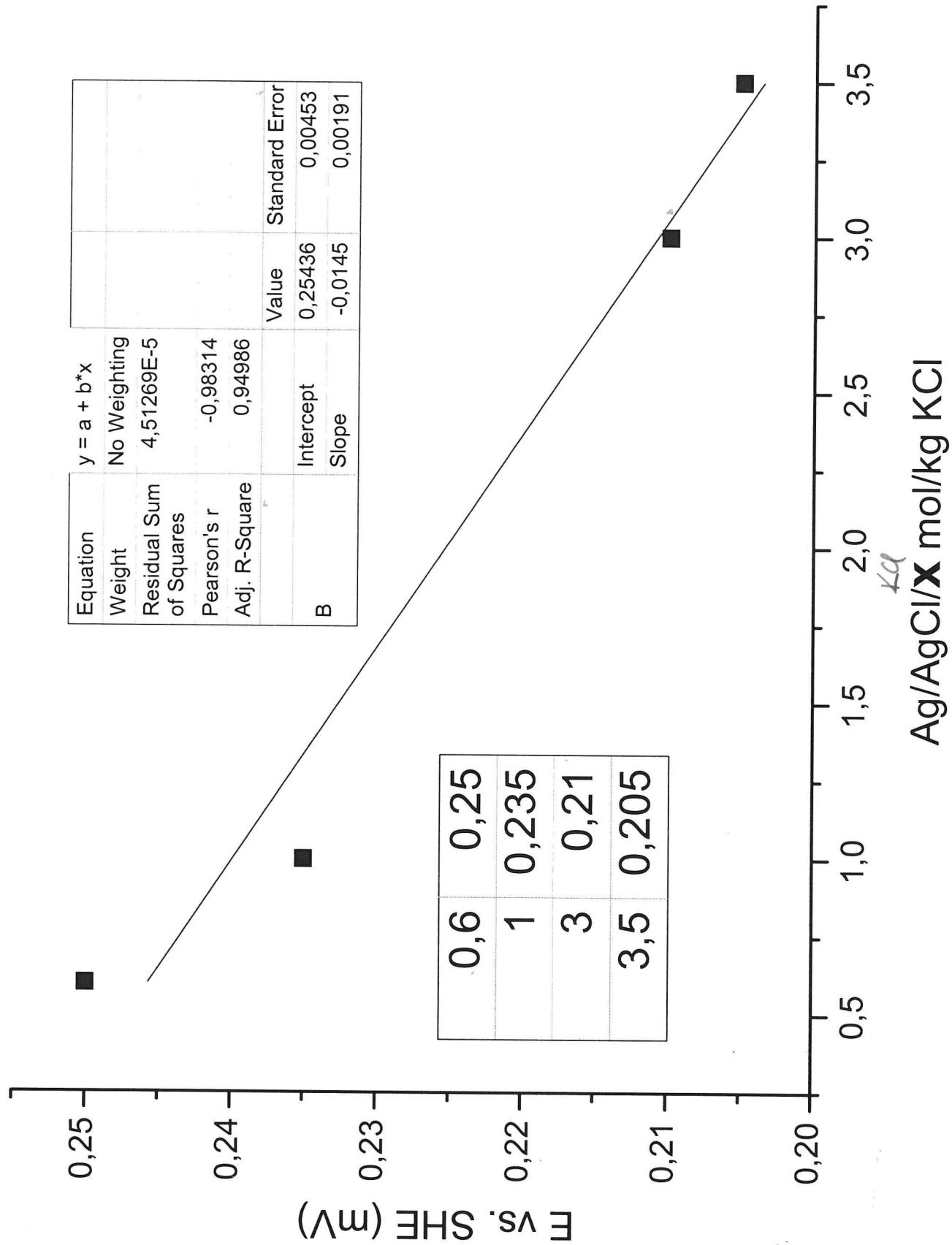
Invented by

Date

Recorded by

From Page No. _____

	$y = a + b \cdot x$
Weight	No Weighting
Residual Sum of Squares	4,51269E-5
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
26.0	90 fA
23.0	60

Arrhenius - equation

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

(1:51:00 + ice $\sim 10^\circ\text{C}$)
 (1:54:00 + ice)

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

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Date

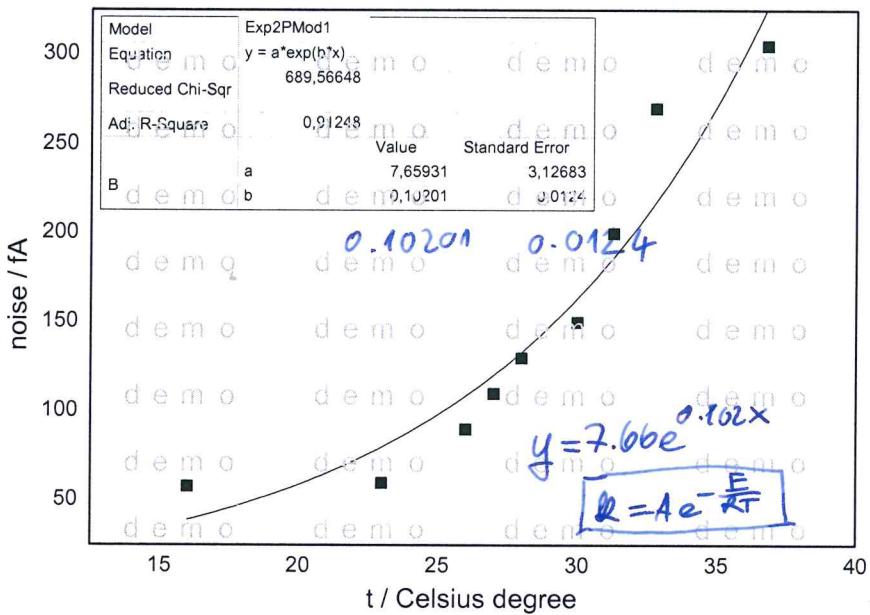
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MNN

The observed noise might be caused by the increased reaction rate. It appears that the magnitude of the noise follows the Arrhenius Form.

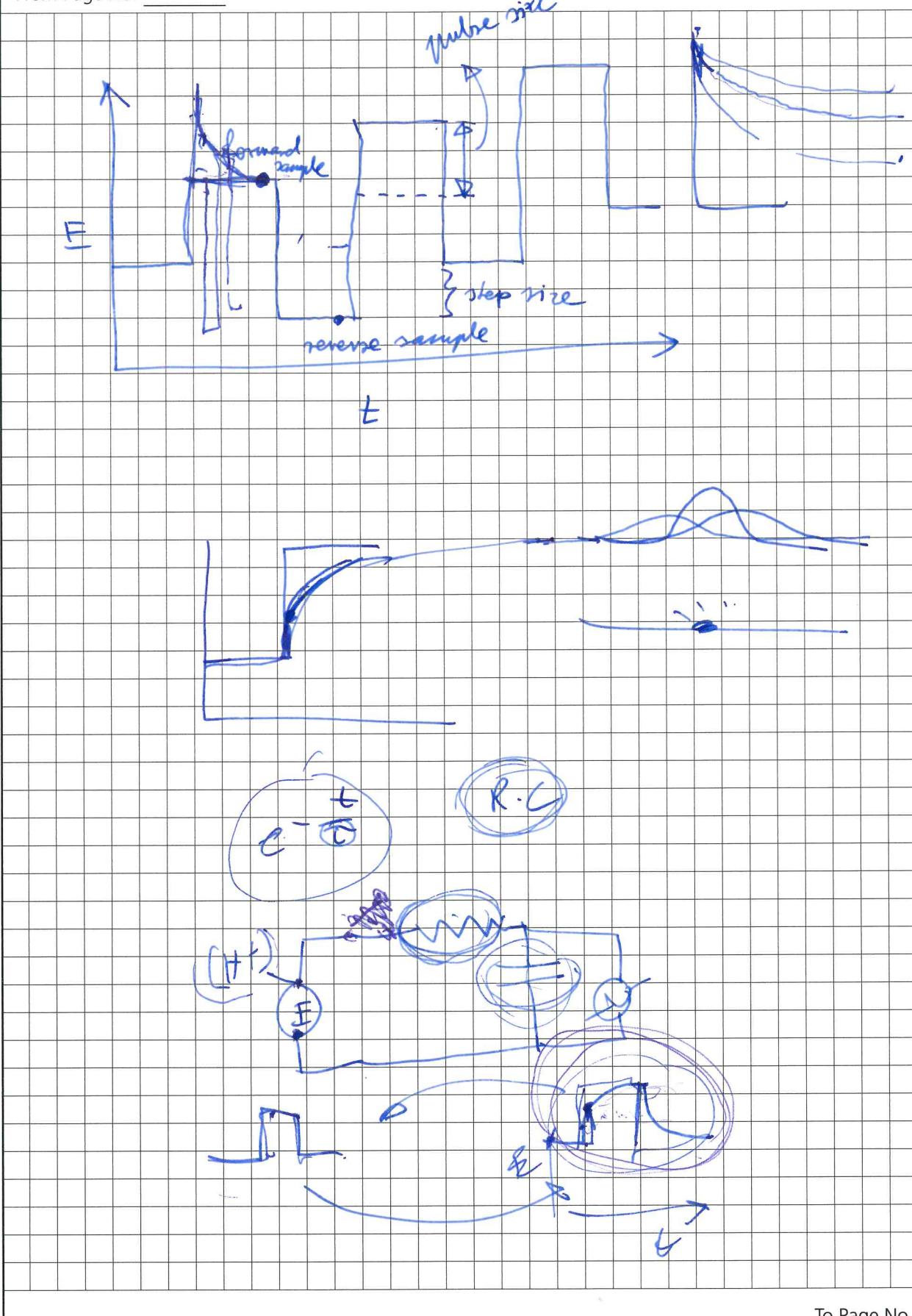
$$R = A e^{-\frac{E}{RT}}$$

Note on 2010.08.07.:
The signal is not increasing with temp., as reaction because the rate limiting step is not the electrode reaction
It's transport limited.
To Page No. _____

TITLE Square wave voltammetry

(Dioannum with Valenbin)

From Page No. _____



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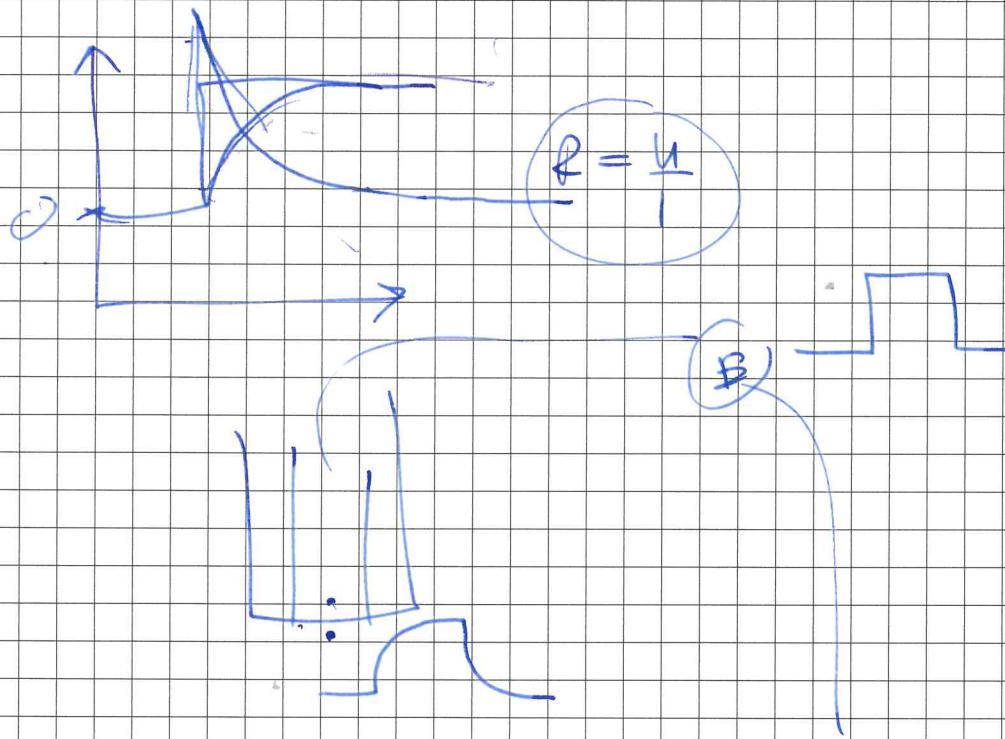
Date _____

Recorded by _____

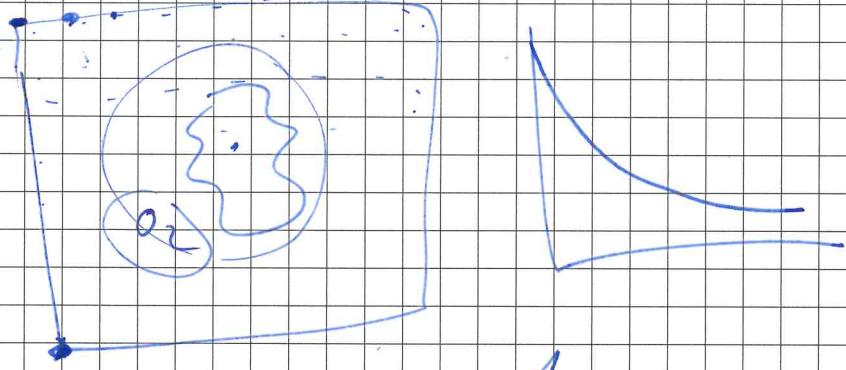
TITLE _____

Book No. _____

From Page No. _____

Discussion with Valentine

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



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

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

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

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by

TITLE Platinum etching in aqua regia

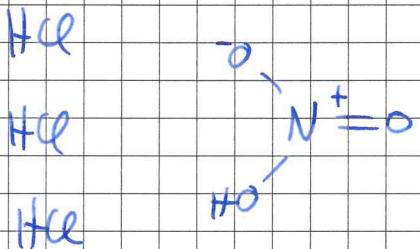
Book No. _____

3

From Page No. _____

mole ratio

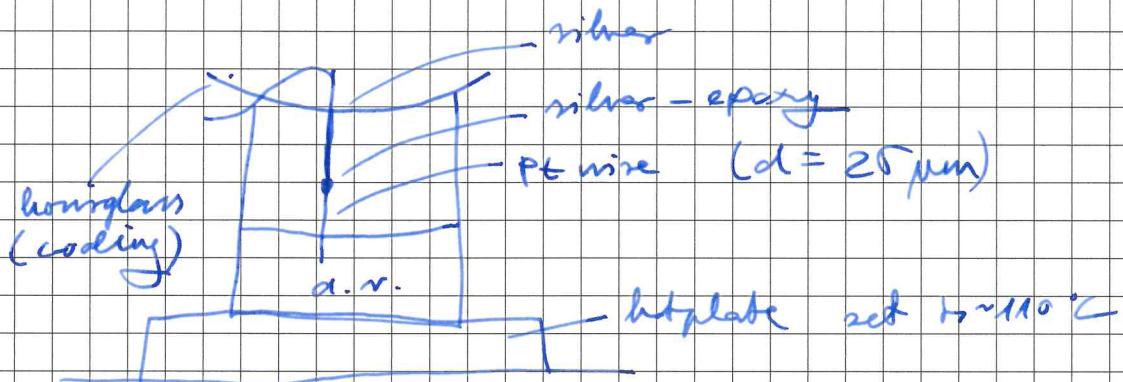
Aqua regia : 1:3 V mixture of HNO_3 and HCl
 cc. cc.



(Mende) $[\text{HNO}_3] = 6.66 \frac{\text{mol}}{\text{dm}^3}$ (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

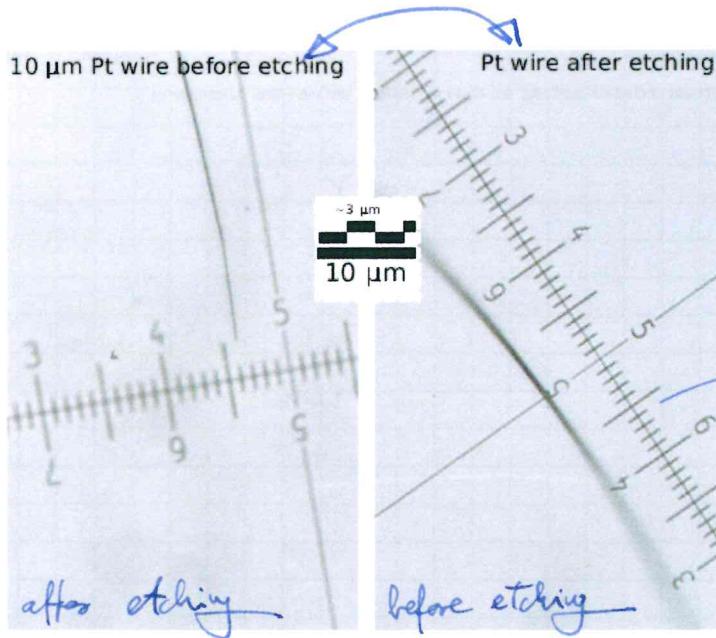
Date

Project No. _____

TITLE _____

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Witnessed and understood by me

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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 ↗ i↑ if t deconvolution
- 7, glass sheet ↗ i-t deconvolution
- 8, Pt wire
- 9, ~~it's this one~~ ↗ deconvolution worked surprisingly well!
- 10, cells: H_2O_2 sink
 ~~H_2O_2 source~~
~~it's this one~~ O_2 sink
 \Rightarrow 2 cells ✓
- 11, spatial deconvolution
- 12, PSF
- 13, :
- 14, thank you ← photos from PES

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

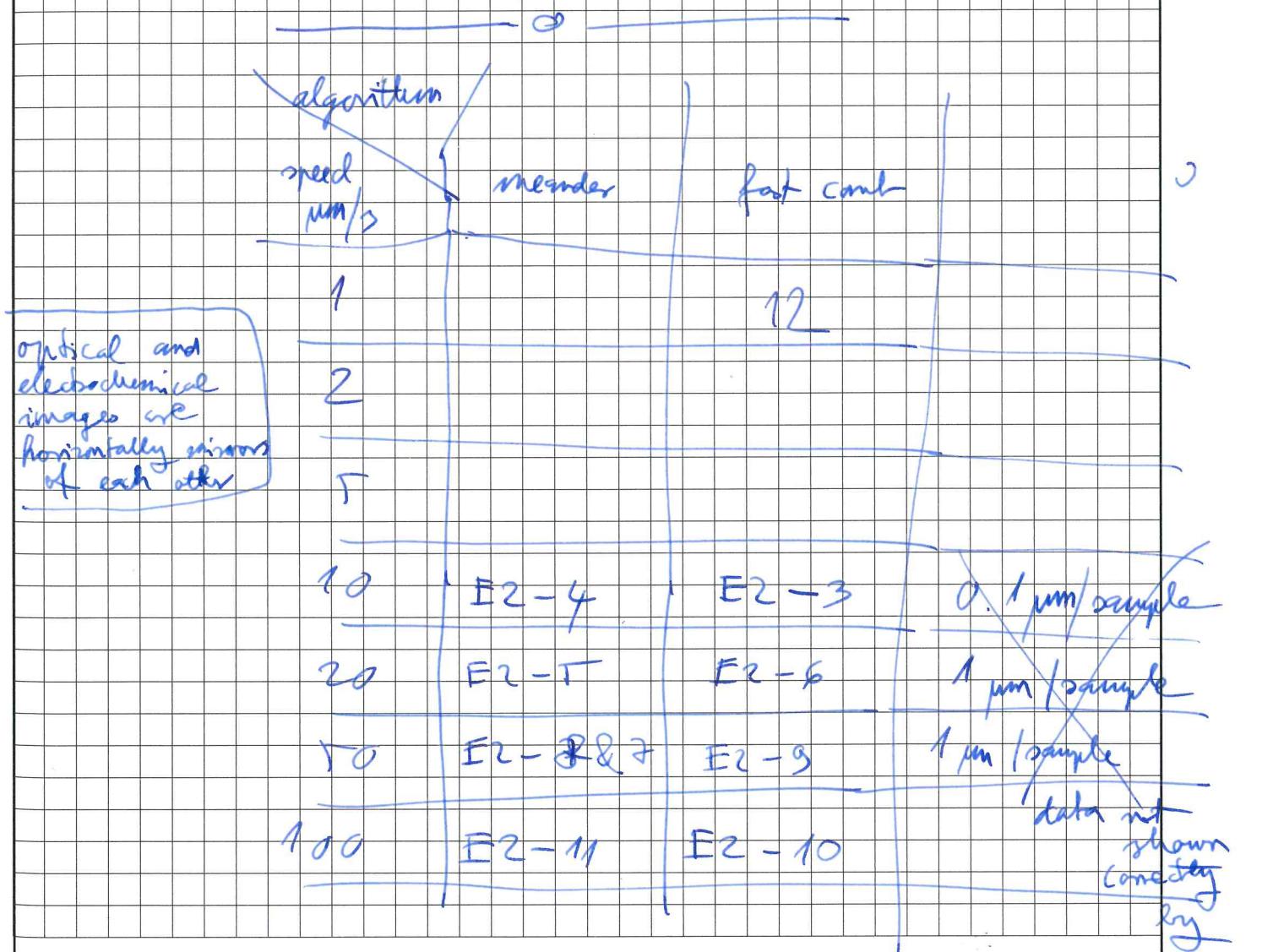
160726

Recorded by

TITLE Additional measurements

From Page No. _____

- 1, O₂ reduction above glass sheet / bulk
 2, ~~O₂~~ change response
 3, very slow scan (O₂ reduction) for
 spatial deconvolution (element possible)
 0.1 μm/s?
- with circular Pt electrode 10 μm
 - electrolyte: PBS + 10 mM glucose (same as for monocytes)



To Page No. _____

Witnessed and understood by me

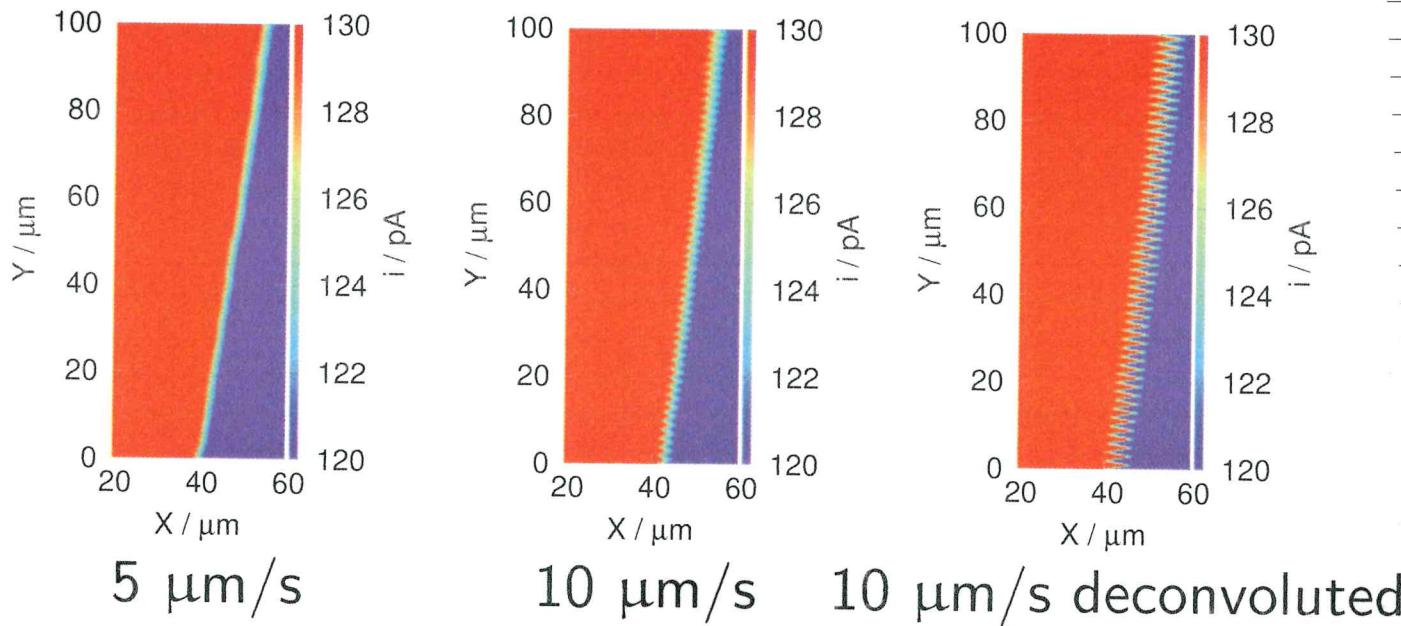
Date

Invented by

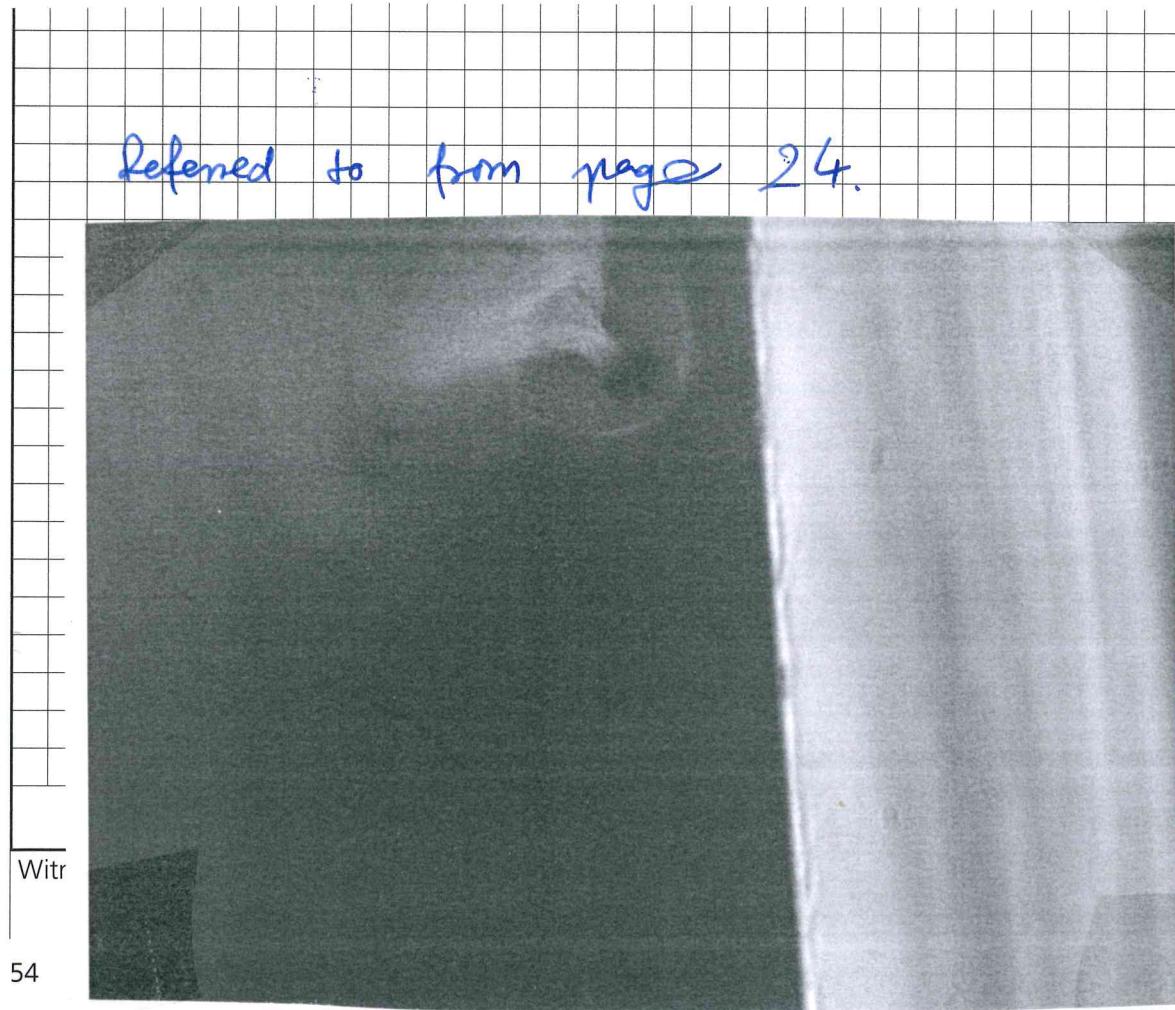
Date

Recorded by

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Referred to from page 24.

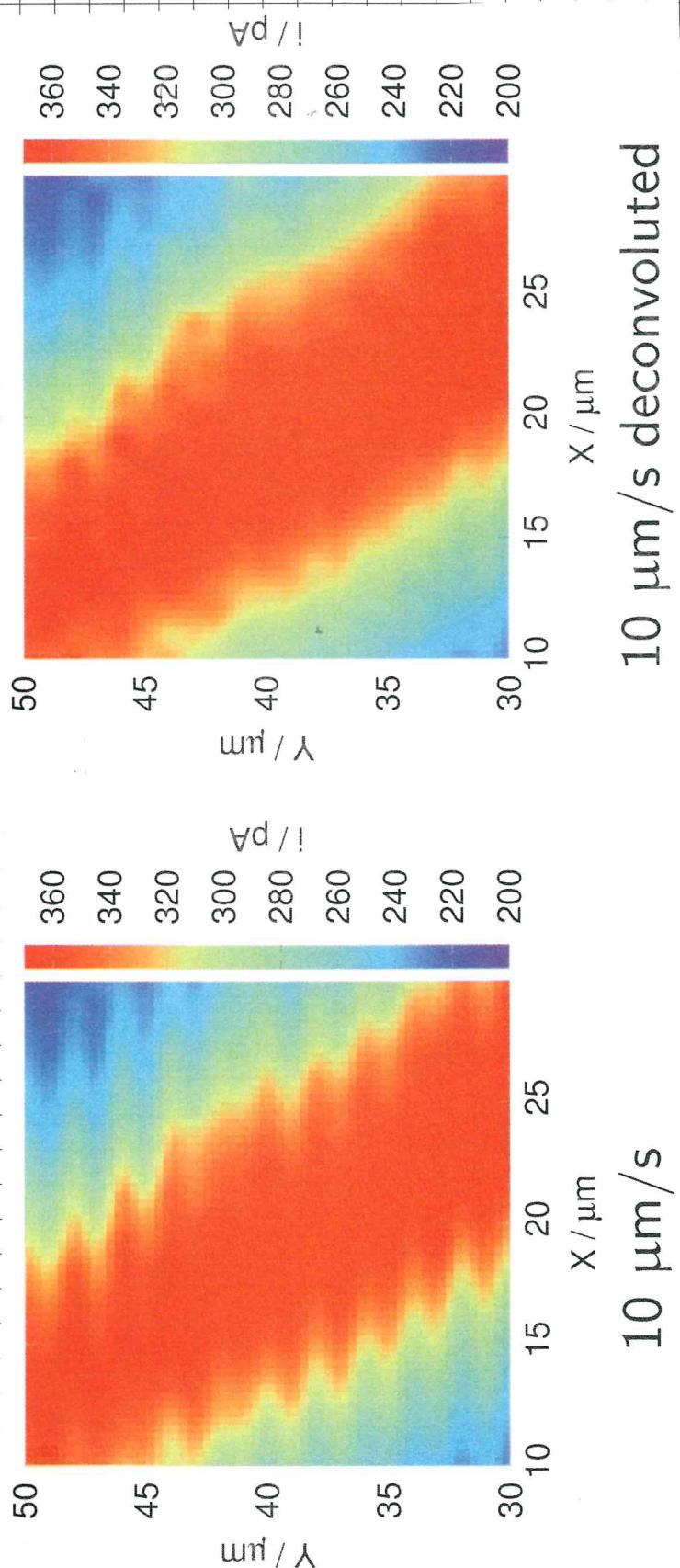


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TITLE _____

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To Page No. _____

Reopened to on page 18.

Witnessed and understood by me

Date _____

Invented by _____

Date _____

Recorded by _____

TITLE Deconvolution of already slow image

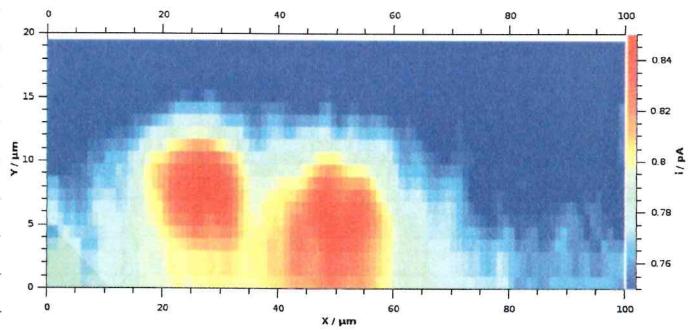
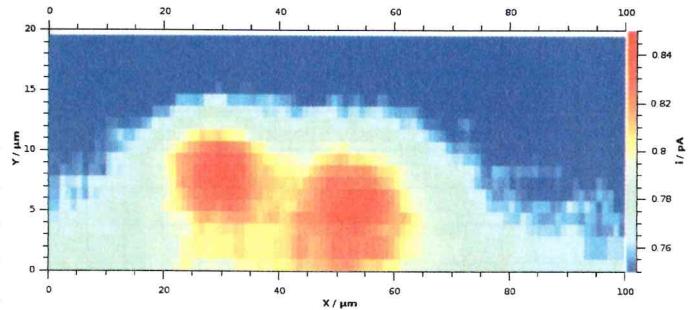
From Page No. _____

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') #close the gnuplot window

```

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

To Page No. _____

Witnessed and understood by me

Date

Invented by

Date

Recorded by