

Monday 29th June 2020

64

shot count: 80195336

flash lamps: 09:20

laser on: 09:45

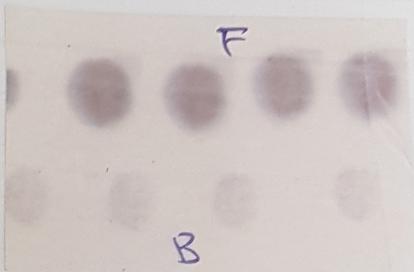
osc@355: 55 mJ

amp@355: 195 mJ

osc@636: 0.9 mJ

amp@636: 33 mJ nlow

$\lambda = 355 \text{ nm}$
Power = 300 mJ



OPO

802.280 nm
799.825 nm
799.691 nm
796.911 nm
800.010 nm
804.917 nm
805.223 nm
806.841 nm
815.000 nm
789.22 nm
~~790.785~~.80 nm,

WM

| | Δnm |
|-----------------------|------------------------|
| 804.058 \pm 0.00257 | 1.778 |
| 801.567 \pm 0.00217 | 1.762 |
| 801.451 \pm 0.00186 | 1.760 |
| 798.664 \pm 0.00226 | 1.753 |
| 801.722 \pm 0.00071 | 1.762 |
| 806.732 \pm 0.00073 | 1.815 |
| 807.037 \pm 0.00093 | 1.814 |
| 808.668 \pm 0.0023 | 1.827 |
| 816.892 \pm 0.00217 | 1.892 |
| 790.988 \pm 0.00183 | 1.768 |
| 787.561 \pm 0.00138 | 1.768 |
| | $\hookrightarrow 1.76$ |

785.8 nm $\sim 40-45 \text{ mJ}$

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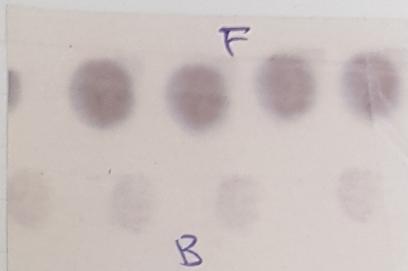
OSCE@355: 55 mJ

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| 787.561 \pm 0.00138 | 1.761 |

785.8nm ~40-45mJ

Try going back to colour to look above threshold.
→^{real!} not older
WM

Start: 694.350 nm

Stop: 696.251 nm

Step: 0.01 nm

WT: 200 shots

filename: CH2CN - laserscan - 29-06-2013.dat
except didn't work!

e-

45.87 μ

~100 mV

39

45.015μ Δ_{10} 45.135μ
 45.185μ

repeat: 45.015μ $\Delta_{10} \rightarrow$ 45.085μ
 $45.120 - 105$
 195

Qscan
 45.080
 45.130
 45.160
 45.19
 45.165

45.210 \leftarrow
 45.245
 45.265
 45.285

Qscan

45.17
 45.285

$45.095, 45.13,$

T_{xy}

start

step

stop

fill

(45.265μ)

Laser scan towards red

$$V_R = 100 \Rightarrow V = 0.9710$$

$$V_E = 753.5 V = 0.732$$

$$QS = 45.150$$

Start: 631.68 nm
Stop: 634.287 nm
Step: 0.01 nm
Wt: 200 shots

OPO = 809.013

WM = 810.826

= 804.77

= 806.557

filename: CH2CN-laserscan-28-06-20n1.dat

High res scan over 8037 \AA

Start: 636.340
Stop: 636.976
Step: 0.004 nm
Wt: 200 shots

OPO

WM

801.496

803.29

800.489

802.2

filename: CH2CN-laserscan-28-06-20n2.dat

Monday 29th June 2020

Tasks for today

- 1) Wavemeter idle wavelength
- 2) High res scan over 803.7 nm
- 3) Extend scan towards red
- 4) O⁻ calibration measurement?
- 5) High res CH₂CN⁻ VMI measurement? 809
- 6) CH₂CN⁻ scan 804.917 → 806.841 (backwards) 801

Results so far

- 1) CH₂CN⁻ VMI @ 799.805 nm $V_R = -100\text{V}$ (n4)
- 2) CH₂CN⁻ VMI @ 802.280 nm $V_R = -100\text{V}$ (n5)
- 3) O⁻ VMI @ 650 nm $V_R = -1000\text{V}$ (n2)
- 4) CH₂CN⁻ scan 799.691 → 805.223
- 5) CH₂CN⁻ scan 804.917 → 806.841 (backwards)
- 6) CH₂CN⁻ scan 796.911 → 800.010

803.7 nm peak = 802.169 nm

O⁻ (?) 40.5 μs 15mV $V_R = -100\text{V}$

$\lambda = 787.5\text{nm}$

MCP delay 23 μs
 $t_0 \approx 29.2\mu\text{s}$

Q_{scan} Δ = 10ns 28.990 μs → 29.17 μs
 28.8 > 28.599 → ?

No e⁻ signal for O⁻.

$V_R = -100$

Try CH₂CN⁻ — Ion: CH₂CN⁺ 2ps 44.6215 μs
 60.52 μs 150MV

$Q_b = 45.75\mu\text{s}$ 45.015 μs → 45.145 μs quite good
 45.715 μs
 45.765 μs

$$\lambda = 802.280 \text{ nm}$$

090

Qs can

$$\begin{array}{r} 45.055 \\ 45.155 \\ \hline 45.205 \end{array},$$

$$\begin{array}{r} 45.140 \\ 45.175 \\ \hline 45.225 \end{array}$$

$$\begin{array}{r} 45.150 \\ 45.185 \\ \hline 45.190 \end{array},$$

Filename: CH2CN-26-06-2015.bm

#e⁻:

#shots: 58, 400

e⁻/shot: $\lambda = 802.280 \text{ nm}$ V_P : -100 V

B: 263.9 μs

C: 125.04 μs

D: 44.6215 μs

Filename : CH₂CN - 26-06-20 n2.bm1.dat
 #e- : 16

↳ image was polluted by scattered rays

16
18.07

72ns → 48ns MCP box
reduce window!

Restart measurement w/ $V_B = 1000V$.

e- 45.94 ns 15 mV

Signal died.

Filename : CH₂CN - 26-06-20n3.bm
 #e- : 4,892
 #shots : 7400
 e/shot :

2 scan
 45.05 45.06 45.085 45.100, 45.12,
 45.135 45.155 , [45.145]

threshold 140 → 130

Filename : CH₂CN - 26-06-20n4.bm

#e- : 161, 187

#shots : 75,000

e/shot :

V_B : -100V

λ_{Dop} : 799.805 nm

Friday 26th June 2020

target: CH_2CN^- @ ~800nm
 gas mix: $\text{N}_2/\text{C}_2\text{H}_4$ @ 4.712 atm
 VHI on
 $V_R = -1000 \text{ V}$ $V_E = 750 \text{ V}$
 75mm
 CH_2CN^- 55.5 ns

$$275 = 44.6215 \mu\text{s}$$

~250mV

Qscan around 45.238

45.125, 45.130, 45.145, 45.178, 45.20

Start: 637.280 nm : 800.010 nm
 Stop: 639.260 nm : 796.911 nm
 Step: 0.01 nm
 Wt: 200 shots

filename: CH₂CN-laserscan - 26-06-2020.dat

now try VHI on a resonance.
 $\lambda = 796.911 \text{ nm}$

$$V_R = 100 \text{ V} = 0.097106$$

$$V_E = 75.35 \text{ V} = 0.073238$$

$$V_B = 800 \text{ V}$$

CH_2CN^- 60.28 ns ~40mV

Qscan

44.975, 45.02, 45.05, 45.09, 45.07

e⁻

45.93 ns

~5mV

(~4e⁻/shot)

Scan started
 Start: 634.200 nm = 804.917
 Stop: 633.011 nm = 806.841
 Step: 0.01 nm
 W+ : 200 shots
 Filename: CH₂CN - 25-06-20 n4 bin1.dat

B: 263.9 μs
 C: 125.04 μs
 D: 44.6215 μs



33

OpenComConfig(1, "", 9600, 0, 8, 1, 512, 512);
ComWrt(1, "TE0", 3);
ComWrt(1, "X0", 2);

Control.C #163

#371
#364

276 // comment
- 379 TE0, 3);
PA, 12);

{ 168 X0, 2);

→ use DO.0100 instead!

634 - 637.5 nm

Qscan

45.14

45.16

45.24

Scan started

Start: 634.01 nm

Stop: 637.482 nm

Step: 0.01 nm

WT = 200 shots

Filename: CH2CN-laserscan - 25-06-2013.dat

∴ signal optimized to 250mV by increasing
charge width.

$\frac{250\text{mV}}{45.18}$, 45.21, 45.24, 45.28, 45.29,
45.3, 46_{ns} 30mV
 e^-

$$\begin{aligned} V_R &= 600\text{V} \\ V_E &= \end{aligned}$$

Modify Control.c to plot events not events/max.
line 166 comment out division.

800nm $\Delta = 0.1 \rightarrow 805\text{nm}$ with ORC step
events vs wavelength
80/nm MAX.

0 laser shots at end of scan - 10600.

CH2CN-laserscan-25-06-20n1.dat

② 100nm $\Delta = 0.05$ 101 steps.

shots in scan \Rightarrow image/update
110000 1000
 $\downarrow 500$

CH2CN-laserscan-25-06-20n2.dat

Thursday 25th June 2020

(1) CH_2CN^-

Ion signal has good presence of H_2CC^- !

?68.75nm
~~75~~ nm - idler + $\frac{1}{4}$ wave plate

| | | | |
|--------------------------|-----------------------------------|---------------------|-----------------------|
| CH_2CN^- | $2\text{PS} = 44.9215\mu\text{s}$ | | |
| 75 nm | VMI | ΔV | $V_2 = -1000\text{V}$ |
| CH_2CN^- | 55.6 μs | $\sim 100\text{mV}$ | |

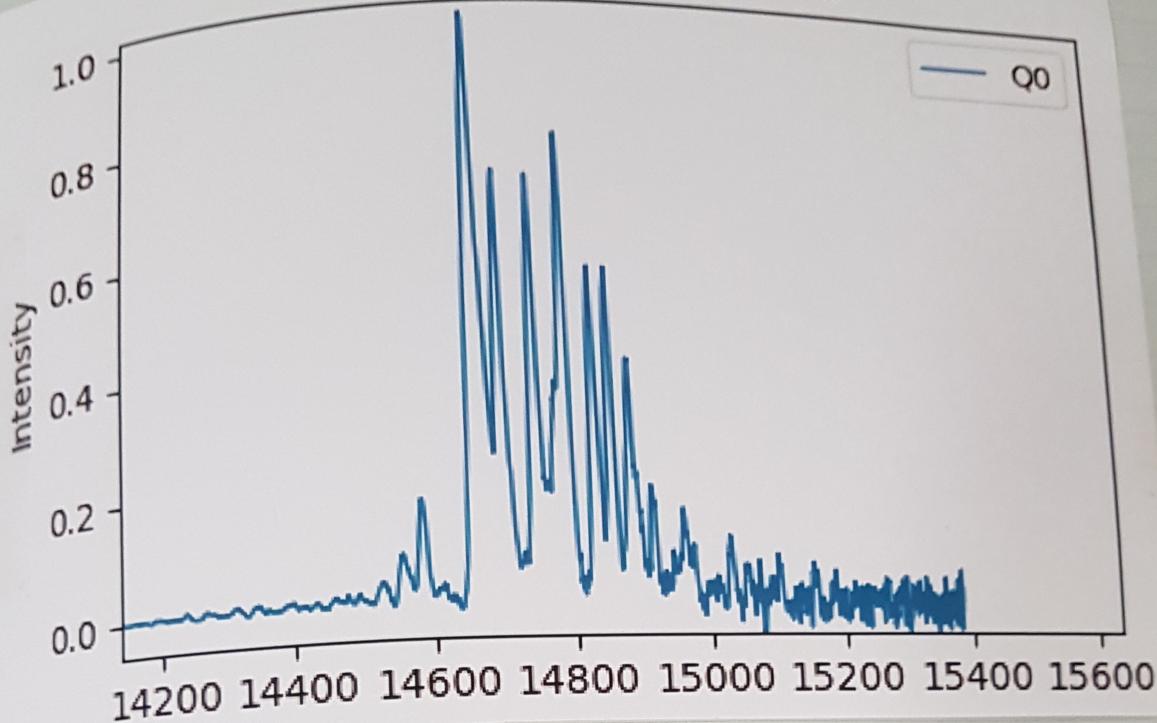
2 scan around 45.2 μs

45.04, 45.06, 45.10, 45.14, 45.20,
 45.24, 45.22,

2 scan
 45.12, 45.15, 45.13
 e^- 45.85 μs $\sim 60\text{mV}$

Filename: CH_2CN^- - 25-06-20nl.bin
e^- : 7550
shots: 19,800
 e^- / shot:

650 nm OH-24J2CMI



heme/photodetachment / VMI / OH⁻ / 650nm / 24 Jun 20

(switch 89.17V1
mp delay 15μs)

V_p = -1000 Volts,

+ 1/4 waveplate

(29)

Wednesday 24th June 2020

 $O^- \text{ at } 650 \mu\text{m} \sim 20 \text{ nJ}$ laser water leaks fixed,
Alignment - pull possible, $O^- \text{ VNE } (V_f = -1000)$ $3.6 \mu\text{s} \quad 250 \text{ mV}$ NCP delay 15 μs
duration 20.3 μs(Qscan 29.3 μs $\xrightarrow{10}$ 29.090 \rightarrow 29.2
29.17) no $\frac{1}{4}$ waveplate

$O^- 24-06-20n1.bnw$
 $e^- : 143,445$ ~~shots~~
 $\text{shots} : 6800$
 $e/\text{shot} : 21$

→ actually OH^- ! OH^- ! $e^- \quad 29.88 \mu\text{s} \quad 400 \text{ mV}$ $B : 330.9 \mu\text{s}$ $C : 78.04 \mu\text{s}$ $D : 29.125 \mu\text{s}$ $QS : 29.17 \mu\text{s}$ $V_R = 1000 \text{ V}$ $kV : 35.5 \text{ V}$ Filename: $\text{OH} - 24 - 06 - 20n2.bng$ # $e^- : 620,601$

shots: 37,200

 $e/\text{shot} : 16.6$

Tuesday 23rd June 2020

target: O₂ @ 650nm

| | | |
|-----------------------------|---------|--------|
| 18mm | 2.7 kV | |
| O ⁻ | 33 μs | ~4mV |
| OH ⁻ | 34 μs | ~21mV |
| O ₂ ⁻ | 46.6 μs | ~1.5mV |

O⁻ optimized to 30-40mV!

$$\sqrt{R} = 1000\text{V}$$

$$2PS = 29.0515\mu\text{s}$$

$$O^- \quad 36.09\mu\text{s} \quad \sim 125\text{mV}$$

$$B: 332.9\mu\text{s} \quad C: 67.04\mu\text{s}$$

- laser problems!!

Q scan around 29.3μs

27

Monday 22nd June 2020

target: O₂⁻ @ 650 nm
O₂ in signal ~150 mV 75 mm MCP
VM1 ON

$$V_R = 1000 \text{ V}$$

$$V_E = 750 \text{ V}$$

Scan around 40.5 μs

Starts at ~40.25 40.31 40.33
[40.40],

e⁻ 40 mV 41.16 μs

39

$$45.015 \mu \xrightarrow{\Delta D} 45.135 \mu$$

repeat: $45.015 \mu \xrightarrow{\Delta D} 45.085 \mu$

$$45.085 \mu$$

$$45.120 - 105$$

$$195$$

$$45.17$$

$$45.285$$

$45.095, 45.13, 45.$

Δ_{scan}

| |
|--------|
| 45.080 |
| 45.130 |
| 45.160 |
| 45.19 |
| 45.165 |

$$45.210 \leftarrow$$

$$45.245$$

$$45.265$$

$$45.285$$

$$V_R = 100 \text{ V} = 0.97106$$

$$V_E = 753.5 \text{ V} = 0.7323$$

$$\Delta S = 45.150$$

(45.265μ)

Laser scan towards red

Start: 631.68 nm
 Stop: 634.287 nm
 Step: 0.01 nm
 Wt: 200 shots

OPO WM
 $= 809.013 = 810.826$
 $= 804.77 = 806.557$

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High res scan over 8037 \AA

Start: 636.340
 Stop: 636.976
 Step: 0.004 nm
 Wt: 200 shots

OPO WM
 $801.496 = 803.254$
 $800.489 = 802.233$

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