4/6/79

short-heat-treatment 75 mins 685°C

Stefans stainless wire $1 10^{-9}$ / 60 / Ne.

ph blank

ph DW x ~6KV

Spectrum off brite pole near probehole 5.86 +800 −850

$2 10^{-6}$ Ne 140/580 60K 687 cons | 2nd spectrum 700 off ? boundary | New Spectrum 5.8/900 140/580 off Black hole on bdary

0	1	356	3	0	0	349	1	0	3	301	1
351	110										
1	71	6	357	6	71	2	350	1	70	3	310
352	68										
	72	18	29 358	7	72	18	351	8	71	54	311
353	42										
	73	7	359	2	73	12	352	73	72	134	24
354	11										
2	99	2	361	2	166	1	28 353	214	73	8	325
355	23										
13.6	246	8	362	1	6 167	4	354	44	76	1	327
356	8										
	247	4	30 364	2	12 233	2	355	7	78	1	329
357	9										
	249	1	367	1	246	3	356	4	99	1	24.5 330
358	6										
14	250	5	370	1	247	32	358	4	6 165	1	331
359	3										
	299	1	32 375	1	13.8 248	23	28 359	19	166	3	332
360	4										
20	300	1	45 448	1	249	1	360	15	167	1	333
361	5										
	338	7			251	1	361	3	9 201	1	334
362	8										
26	339	9	Al 13 Si 5		253	1	362	1	220	1	335
363	1										
	340	6	Cr 68 − 33 = 35 5.38		300	1	364	2	12 221	3	336
364	3										
	342	1	7.538 + 573 88%		302	2	30 365	7	2221	26	337
365	1										
	343	1	Ni 26 = 24 2.2		22 316	1	366	3	244	13	338
367	2										
	344	5			24 325	1	371	1	245	17	339
369	1										
	345	10			334	3	372	1	246	4	340
374	1										
27	346	22	C 9 1.36		395	5	375	1	247	3	341
375	1										
	347	3	Si 61 9.2% 26		340	38	378	1	249	7 27	342
388	1										
	348	3	Al		341	32	881	1	250	1	343
398	1										
	349	1	16.6%		342	10	ph blank		5.5 262	1	344
406	1										
	350	23	Cr 135 − 25 = 110		343	4	ph DW 83		18.5 286	1	345
451	1										
	351	196	Fe 401 427		344	3	Move to black hole on bdary		20 292	1	346
502	1										
28	352	251	Ni 58 · 55 8.7%		345	2			295	1	347
509	1										
	353	56	Something		346	13	ph x 3		14.9 296	6	348 62
512	1										
	354	7	wrong	27	347	17			28 297	7	349
267	734	1									
	355	5	I think not enough		348	7			298	5	350
271	810	1									

Cr 26, 25

C 5+4+4 1.032

Al 27 2.94

Si 9 .72

Cr 281 229 18.22

Fe 832+52 886 10.5

Ni 85 83 6.62

ph x 3

Move axial

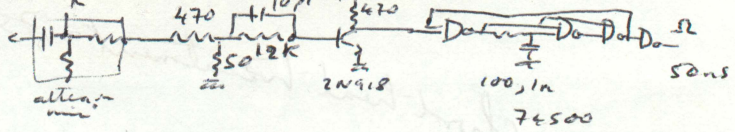
ph x 2 6.05Kv

ph Nuphan 2

ph x 4

going here

Timer now started from pickoff on microscope, rather than trailing pulse direct from pulser so a) calibn slightly off b) can use delay line without having to subtract $\frac{1}{2}$ from $\frac{1}{4}$ sight



Tues 5/June Same S-S specimen $8\,10^{10}$ cold −60, Ne.

Spectrum off to away below centre

150/580 $2\,10^{-7}$ Ne/60 6.33 + .8 − 1 KV pulse HT goofy ± 15v unstable.

~2200	0	6	2851	3424					
H	66	125	3071	3435					
	67	50	3091	3444					
	674	1	3143	34523					
	93	1	3163	3465					
5.9	156	2	3171	3473					
	157	2	3181	3502					
	158	1	3192	351 1					
	165	1	32012	3531					
	179	1	321124	3551					
	191	2	32287	3601					
	204	1	32315	3641					
10	206	1	32422	3831					
	219	1	32512	4351					
12	220	2	3267	4361					
13	2324	0	32723	4863					
	2333	45	32838	7941					
	2348		32911	8071					
	2352		33016						
	2363		33122						
13.6	23715		33285						
	2384		26.8 33361	4					
	2401		33478						
	2411		33510	4					
	2481		33660						
S	2521		33728						
	2551		33823						
	2691		33965						
	2831		34024						
19.9	2842		3419						

Total spectrum off matrix 6.48 + 1 − 7.28 1262 cm

0	1	3199	7351						
11	1	32041	7571						
28	1	3211	3						
64	18	3226							
65	102	32310							
66	16	32413							
100	1	32515	5						
207	1	32640	1						
225	1	32712	7						
226	2	32873							
227	16	32910							
228	5	33006							
231	4	33117							
2324		33215							
236	1	33304							
256	1	33403							
266	1	33501							
276	1	33602							
302	1	33711							
3085		33885							
3091		3401							
3121		3411							
3133	11	34221							
3142	72	34337							
3156		3441							
3167		4161							
3177		5341							
3182		5531							
		7301							

160/580

6.84 : 14°

ph blank

ph x> <DW

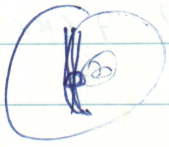
ph x> DW

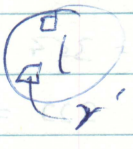
Move to bdary ppt

ph x>

New spectrum off boundary

check aligned @ 1200 ions, ~ ox





γ'? - bright

7.05 + 1.1 — 170/580

0	2	301	1	326	6	0	1	308	1	330	1
18	1	302	7	327	6	62	2	309	7	331	1
22	1	303	48	328	5	63	25	310	3	334	1
62	21	304	29	329	2	64	10	311	15	352	1
63	80	305	48	332	2	88	1	312	51	364	1
64	11	306	26	334	1	159	1	313	7	367	1
88	1	307	8	338	1	191	1	314	2	569	1
148	1	308	17	346	1	221	4	315	6		
194	1	309	31	436	1	222	5	316	34		
208	1	310	28	442	1	226	3	317	401		
218	1	311	24	1006	1	242	1	318	343		
219	2	312	18			244	1	319	22		
220	4	313	26			270	1	320	11		
221	21	314	433			272	1	321	5		
222	8	315	274			278	1	322	7		
223	5	316	277			299	1	323	19		
224	3	317	298			300	1	324	4		
225	8	318	108			301	1	325	1		
226	1	319	26			304	1	326	2		
227	1	320	28			305	10	327	1		
229	1	321	11			306	61	328	4		
297	3	322	21			307	13	329	2		
298	2	323	15								
299	1	324	5								
300	1	326	3								

ph x> DW 7.5 rev

Move to ? γ' @ top

170/580 7.25 + 1.15

ph x> — ppt going or gone ?

— ppt @ v top left of pic

~~ph~~ ph <DW x 2

showing plate edge.

going from time.

ph blank

xx

Tri 8 SS 60/610^{-10}/We

1

IAP × 3 axial 7.6KV

IAP × 2 everything

63 = 510 = ?28 Fe

1 = 96-78 Al 13.5 = 354 = 63

C$_{12}$ = 333 = 41

C$_6$ = 236 20

N$_{L\to 0}$ = 528 = 65

Fe^{2+} ~405 gas out.

Al "

Al "

Al "

Fe^{2+} "

IAP BIV × 2

More down DW × 2

Fe pop 20

Fe 40

Al "

Al "

Al "

C$^+$ "

[Fe^{2+} pop] "

Fe^{2+} "

Al^{2} "

Al^{2} "

Al^{2} "

IAP × 2

ph × 4

IAP × 2

Fe^{2+} 30 – ? pup

[? Fe^{2+} "

Al^{4+} 30 sec

Al

Al ?

Fe^{2+} 303 — 6½ planes counted.

IAP × 2

ph × 4

~~IAP × 2~~

~~IAP Analysis~~

IMP × 2

Fe^{2} pup

Fe^{2} "

Al 30

Al "

Al – flare –

Al "

C^{2+} – 26 40

C^{2+} "

Fe^{2+} "

IAP × 2

IAP 7 or 8 small evap seq

ph × 2 7.7 KV

~~ph analysis~~

ph × 2

ph × 4 while pulsing – see blanks.

Spectrum 7.8 + 1.24 190/580 off central brightline.

check alignment @ 700 rom × 1000

~ vor
190/580

0	6	298	7
58	1	299	69
59	10	300	362
60	73	301	669
61	30	302	177
64	1	303	42
6 140	1	304	14
142	2	305	8
198	2	306	24
208	1	307	9
209	6	308	3
17.5 210	16	309	2
211	2	310	5
213	6	311	12
14 214	12	312	1
215	7	314	1
217	1	315	3
20 252	1	316	2
256	2	317	1
283	1	318	1
15 284	5	382	1
285	2	385	1
286	1	389	1
288	3	3452	1
289	39	782	1
290	103		
291	14		
292	10		
293	4		
294	10		
295	52		
296	42		
297	11		

Matrix

0	0	298	16
59	10	299	82
60	59	300	488
61	8	301	636
63	1	302	149
198	2	303	31
208	1	304	11
209	7	305	20
210	42	306	58
211	29	307	34
212	1	308	16
213	1	309	1
214	13	310	10
215	2	311	20
216	1	312	16
217	1	313	10
218	1	314	2
284	1	315	2
260	1	316	4
282	1	317	3
284	4	318	2
285	1	325	1
286	1	449	1
2889		778	1
289	28	859	1
290	102		
291	23		
292	14		
293	10		
294	18		
295	51		
296	34		
297	7		

& blumlich area
to one side (ph pic)

0	1	297	17
59	7	298	29
60	40	299	53
61	20	300	176
141	1	301	270
143	1	302	206
209	27	303	45
210	143	304	13
211	38	305	30
212	4	306	67
213	1	307	28
214	6	308	9
215	3	309	5
218	1	310	12
221	1	311	25
224	1	312	16
226	1	313	6
255	1	314	2
282	1	315	4
283	1	316	6
284	1	317	4
285	1	318	3
286	2	319	2
287	1	320	1
288	4	321	1
289	26	324	1
290	37	451	1
291	28	453	1
292	10	456	2
293	5		
294	8		
295	18		
296	18		

all 140/580

ph x >

ph x > explanation < Dr

ph x > thoughts rev

ph x > higher Kr 8.15

ph Church

gently home time

Sat 9 June $3 \cdot 10^{-10}$ cold ($8 \cdot 10^{-10}$ on diff pumps)

60 (Ne) 8.2 ± 1.2 2090/580 (bolt)

Spectrum off ? bright pt near center

switches on/off altered (<5 not free run)

0	101	??	?2nd ions			~2200			
11	1	237	1	298	43	0	6	210	2	290	32	421	1
57	2	256	1	299	24	57	5	211	1	291	23	422	1
58	18	261	1	300	4	58	78	219	1	292	93	427	1
59	18	271	1	301	1	59	148	231	1	293	410	428	1
60	1	272	2	302	2	60	7	252	294	420	440	1
132	1	273	2	303	11	80	1	236	2	295	57	445	1
137	4	276	3	304	9	132	1	237	1	296	11		
138	9	277	14	305	2	134	1	247	1	297	22		
139	1	278	10	306	1	137	4	249	2	298	79		
189	1	279	3	307	1	138	13	258	1	299	54		
178	1	280	5	308	1	139	3	269	1	300	6		
179	1	281	33	310	2	140	1	271	1	301	3		
180	1	282	161	311	4	142	1	272	2	302	8		
190	1	283	171	312	1	168	2	273	1	303	16		
191	1	284	30	313	2	169	1	275	2	304	27		
193	3	285	23	314	1	181	1	276	3	305	3		
194	4	286	18	316	1	192	2	277	4	306	2		
199	203	6	287	23	317	1	193	4	278	5	307	3		
204	18	288	61	319	1	194	2	280	7	308	2		
205	32	289	29	332	1	201	2	281	15	309	3		
206	3	290	25	371	2	202	1	282	111	310	1		
207	4	291	36	378	1	203	5	283	161	311	2		
208	~~215~~	292	182	379	1	204	38	284	49	312	1		
209	6	293	565	386	1	205	92	285	13	313	1		
210	2	294	294	640	1	206	24	286	27	314	1		
218	1	295	41	707	1	207	3	287	4	379	1		
2281		296	20	10161		208	14	288	45	386	1		
236	2	297	12			209	13	289	24	414	1		

ph x>

ph x> after DC compl in N_c

ph x> " nS " " .

IAP for ph

finish IAP near centre

- same phase as last question I think.

Zn 40

Al 30-40

Al "

Al "

Al 50

Zn 40

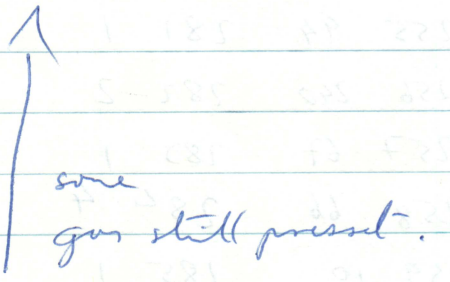
? N_i - tail of Zn peak.

IAP Mg

N_i <- ? Zn

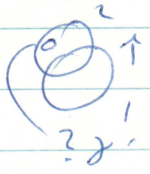
N_i

Al - pop



some gas still present.

IAP DIV x>



IAP x> more up ? y

Al 30s

Al

~~Zn~~ Zn

Ag N_i

N_i

Al

Al

N_i

N_i

C_r

C_r

IAP Blank

Zn

C_r

unstable - blank

VAT ×3

ph × 5

nSymbole ph CDw × 3

ph Dw × 1

ph Rupfth

ph × 1

Symptome, anal 245/580 9.9 + 1.65 — var

0	3	250	7	276	15
9	4	251	9	277	7
10	13	252	2	278	3
11	15	253	5	279	6
52	3	254	15	280	12
53	69	255	94	281	1
54	82	256	240	282	2
55	2	257	67	283	1
58	2	258	66	284	4
60	1	259	10	285	1
127	1	260	75	286	1
163	2	261	126	349	1
183	1	262	51	354	1
184	10	263	53	389	1
185	69	264	240	476	1
186	153	265	1570	502	1
187	21	266	1502	547	1
188	9	267	278		
189	24	268	109		
190	8	269	32		
191	1	270	156		
192	1	271	63		
195	1	272	41		
196	3	273	10		
198	1	274	44		
212	1	275	45		

Mon 11 June same SS orbit TJ 93 9.4 + 1.7 J 240/580

looking for Ni/Na l ~ 10^{-7} Ne/60

correlation

10K ions @ an / volt.

top summed up ? over ten

- look @ pix => bright ppt top left (= where previous ppt was)
- difficult to align properly as @ edge of fig.

TJ94 10.02 + 1.75 240/580 $5\bar{1}0^{-7}$ Ne

- 500 ions

? ppt mass families ? gone.

ph blank

ph x 3 CDW on axis

ph x 3 DW

IAP blank.

- flushed (

12/6/79 Reproduced SS short heat t.

$6 10^{-10}$ / 60 / Ne

ph shut

ph 6·5 KV

3.10^{-7} Ne 6·5 + 1·16

160/580 central bright region

0	0	224	5	ph →	? bdwy		6·8 + 1·16	170/580	
64	4	225	28	off	? bdwy				
65	28	226	74	0	0	297	4	227	21
66	79	227	46	61	1	302	2	229	2
67	2	228	5	62	5	303	2	230	5
92	1	240	2	63	22	304	6	231	2
227	1	241	10	64	108	305	1	232	13
228	2	242	39	65	8	306	4	233	1
229	11	243	10	151	2	307	7	234	2
230	75	244	1	196	1	308	49	240	1
231	129	245	2	210	1	309	80	242	2
232	12	246	4	211	1	310	27	410	1
235	1	247	6	212	1	311	5		
236	1	248	5	222	2	312	7		
318	2	249	1	223	22	313	4		
319	1	250	1	224	27	314	16		
320	2	251	2	225	3	315	11		
322	1	254	2	226	2	316	5		
324	1	246	1	227	1	317	2		
325	5	474	2	228	7	318	18		
326	5	475	1	229	1	319	42		
327	7	484	1	240	1	320	224		
328	10	495	1	258	1	321	178		
329	7	501	2	270	1	322	32		
330	45	502	1	271	6	323	2		
331	46			272	7	324	6		
332	11			281	1	325	8		
333	2			294	1	326	28		

P 4/1/21

15th – programming KIM to read time, drive 3D & tape punch.

16th Trial system T395 6.89 + 1.2 − 1.37 170/580 110^{-6} N_e 60

^ axial on specimen

1200 + cond – blue box quit ½ way thro

0 124 ← blue box dodgy, think

62 1 316 7

63 33 317 8

64 128 318 30

65 8 319 120

67 1 320 283

89 1 321 157

223 3 322 56

224 1 323 7

226 1 324 2

228 3 325 5

229 1 326 6

230 1 327 3

271 7 329 2

272 9 331 3

274 1 337 2

302 5 338 1

303 2 341 1

304 1 358 2

306 2 454 1

307 10 762 1

308 48

309 56

310 16

311 5

312 6

313 3

314 17

315 11

15/6/79

15 ~~Rb~~ Shredder specimen Fe/Si/gb.

(1 10^{-7} 60K — Ne

3.8KV ph x 3

? <111> or gb.

Specimen ~~off~~ far from axis — ? 3 days.

3.9 + 0.6 92/580 (difficult to align)

~~T398~~ ?

3 x diff

Cu roll.

81	3	423 1	
82	3	424 33	
83	3	425 85	ph x 3, 4.7KV
84	3	426 119	nS probe
85	1	427 11	-> <111>
294	2	428 2	~4 x DW
296	1	~~425~~ 430 1	
299	1	432 5	4.55 .5.5+1, ~111 environs
301	2	433 39	140/580 T398 —no3 ——>
302	7	434 76	~ 6.09 at 2o.
303	4	435 19	matrix
307	2	436 2	
308	7	437 1	
360	1	438 3	
367	1	450 1	
407	1	559 1	
408	3	610 1	
409	1		
413	1		
414	28		
415	26		
416	13		
417	5		
418	8		
419	3		

0	1
68	1
69	8
70	10
98	1
248	4
249	50
250	16
253	2
254	1
288	1
297	1
344	22
345	38
346	4
349	10
350	264
351	655
352	129
353	4
354	21
355	5
356	1
357	1
358	1
359	1
863	1

— ph x 3

— engt — gb

ph x 3

nSpoke ph x 4

T399 5.7 + 1.1 —

1401580

rebin @ 100 ions — every time

0	0	354 11
18	2	355 2
67	1	375 1
69	14	392 1
70	28	
76	1	
164	1	
248	4	
249	26	
250	18	
254	1	
258	2	
297	1	
347	7	
344	24	
345	18	
346	7	
347	1	
348	2	
349	25	
350	351	
351	37	
352	135	
353	17	

from boundary

Si 51 5.161 · 7²

Fe 497 boundary at 90

ph x 3 or so

ph x 2 around

ph ratio

6·48 DIV ph x 5

IAP x ≈ 10

IAP ratio

IAP along bdry

IAP on blank hole on bdry.

Fe²⁺ 74 = 680 = C = 113

C⁴⁺ = 393 = 50

C²⁺ = 278 = 34

Si²⁺ = 424 = 52

Fe²⁺ 60s

Si²⁺ 60s

C²⁺ 60s — rubble

IAP x 3

IAP x 3

943
163
1156
75
1231
75
1231

Fe 2+ dual

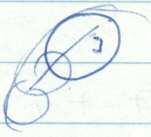
Fe 2+ 60s

Si 2+ 4

Si 2+ .

IAP x 3 ?

top MIX 3



Fe 2+ 60,

Si 2+ 60,

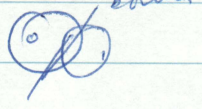
Fe 2+ rapida 30s

Si 2+ -

Si 2+ .

IAP x 3

IAP x 1



~~IAP N.~~

ph x 3 - pretty n

ph x 3

IAP Anglo

IAP x 3 - typish

Fe 2+ 40

Si

Si

IAP x 3

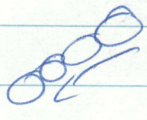
Fe 2+

Si 2+

Si 2+

IAP x 3

IAP along boundary



ph x survival

ph blank

spectrum off below 5-9 + 1-3 160/580 T 400

T4001 800 ins

0	2
64	1
65	15
66	59
~~67~~	
233	1
234	16
235	20 20
239	1
280	1
322	1
323	1
324	22
325	20
327	1
328	4
329	39
330	417
331	162
332	7
333	7
334	9
335	1
336	1
369	1
465	1

ph blank
gonorrhoea titre

Sat 16 June Same Fe/Si gb 810^{-10}/60K/Ne

3 xpk where yesterdays T400 taken, 6.18 KV

More up bdary

pk x 3.

T401a from bdary 5.8 + 1.0 160/580

(0	10)	222	10
64	5	223	15
65	64	224	10
66	106	225	1
67	2	226	4
91	1	227	2
155	1	C^{++} 253	1 32
217	1	C^{+} 547	1 97
222	11	847	1
224	28	895	1
225	41		
226	2	(1707)	
228	2	98	
229	3	5.4% (at%) Si ± .55%	
240	1	at bdary	
269	1	C_3^{2+} 0.28% C	
280	2	Ne	
322	1		
323	15		
324	55		
325	43		
326	4		
327	7		
328	15		
329	216		
330	997		
331	312		

T401b ~~off~~ away from bdary (outside) (30)

5.8 + 1.45 160/580

0	1	230	1045
16	1	231	81
64	4	232	19
65	23	233	18
66	57	234	3
193	1	235	1
222	6	236	2
224	49	953	1
225	26		
226	1	Si 89	
228	3	1820 Fe	
229	2	4.6at% Si	
242	2	± .49	
270	1		
279	1	3 x pk where T401b	
280	1	9 x pk overall – pretty, 6.78 KV	
293	1		
322	5		
323	20		
324	64		
325	11		
326	3		
327	2		
328	64		
329	472		

spun individually crystal →  cage on end

2 crystals 6·7 KV

T402 cage grown by @ 400 cms  160/580

- total 1500 5·8 + 1·6

ph × 1

ph multiple

ph × 2

ph × 2 axial

nS crystal, ph × 2 axial. — still <111>

ph × a few - crystal ~ 8+ KV

gas out - de crystal image

nS crystal image

flashed.

T402a

0 – 2	327 10	Si	61
24 1	328 52	Fe	1200
64 17	329 363		
65 83	330 640	4·83 ± ·62 at %	
66 122	331 47		
67 2	332 15		
217 1	333 12		
232 3	334 1		
233 10	335 1		
234 35	336 1		
235 5	337 1		
238 3	466 1		
242 3	619 1		
247 2			
322 3			
323 8			
324 30			
325 8			
326 8			

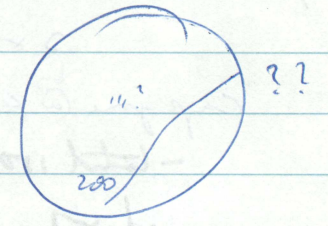
New spin

~ 10 keV ph ×)

~ 5 pulse ph ×)

? gh ths ph ×)

no. <DIV ph ×)



Spectrum 10 + 1.7 ~ linear 7E0/580

rapid

0 (2) T403

54 14

55 5

~~56~~ 74 1

76 1 32 Si

192 12 958 Fe

193 13 3.23 % Si ± .57

194 5

197 1

199 1

265 7

266 27

267 4

268 4

269 17 Flashed.

270 322

271 286 ph Mufish

272 128 IAP Mufish

273 59

274 6

275 5

276 3

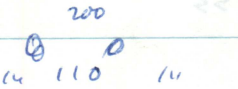
277 2

18/5/74 Te Sb Shredder

$(110^{-9}/60/No$ 4.4+1.0 120/580 - difficult to align T404

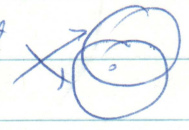
~180 ions

ph x 3 - odd pinhole ?

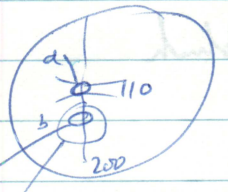


ph x 3 6.3 KV bolt

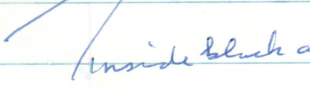
ph x 3 top



T405a 150/580 off ? bdary ??



T405b



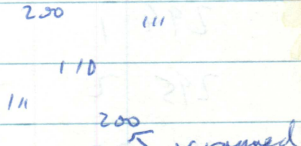
ph x 3 on more - pretty

T406 off dark area near central (1)
- 500 ions, all Te. 150/580

T407 off ? bdary across bottom
500

T408 same place as 405 — pure Te.
1000 ions

ph x 6



T409

empt to 8.3 KV ? gb

ph x 3

T410a 7.6 + 1.4 190/580 No.
2K ions

b to left along bdary

456 66 7	2
524 67 18	24
68 21	31
736 182 1 =8 ?	
277 1 18.6	
287 4] 20 No	
2881	1
~~3021~~ 22	3281
3322	3321
	3322 4
333 22	12
334 25	25
335 3	3
337 6	5
338 82	47
339 265	276
340 438	88 410
341 65	111
342 8	19
343 6	10
344 2	5
345 2	1
346 1	3471
352 1	4781
363 1	

384
94
478

410	6	207	7
57	1	312	1
58	2	364	1 (41)
59	18	424	2 (55)
60	325	426	1
61	295	445	1] 606 !
62	2	446	1 (56)
64	2		
65	7		
67	12		
68	2		
84	1		

[142 1] C^{++}

[199 1] C^{+}

207 1 CH^{+}

2301 16

255 1 (20)

256 3 Ne

257 1

297 1

294 1

295 2

296 37

297 29

298 10

299 17

300 67

301 269

302 687

303 150

304 35

305 9

306 6

2e Sb

19/5/79

Messung 60/Ne 200/580

T 411 ~~Abstand~~ from biasing 8.3 + 1.2

T 412 " " 8.0 +1-25

differential linear

138 5] 477 ?
139 4] e+ 9 x ph 8.40 keV bis.

181 1 10.5
187 1 11.2

195 7] e+ 1AP x 4 or 5
196 1]

209 1] 14 2e 2+ 66 = 520
210 2] C 2+ 250 = 31
211 1] C + 353 = 43

237 1] 18 Sb ++ 794 = 117
238 2] Te + 764 = 114

250 1 Ne C 1,8 432 = 53

267 1 22 Sb 2+ 645 = 101

270 1 23.5

272 1 Te 60 s

274 2 Sb 2+ "

275 1 Te 40 grün

284 1 Sb 60

285 2 Sb 60

287 2 1AP x 3

288 4 Te 30

2 24 296 = 28 Sb 2+ 60

307 1 32 Sb 2 3 60

320 1 31 Te 30

323 1 32 Sb 2 60

329 1 34.9 Sb 2 60

415 1 1AP x 0

419 1

Te

Sb

Sb

IAP ×2 (10)

IAP ×2 (9)

Te 60

Sb 120

Sl 120

IAP ×2

ph ×2

ph Mspth

IAP Mspth

IAP ×2 (8)

Te 40

Sb 60 ?

Sl 100

IAP ×2

ph ×5 should be T412.

T412 200/580 (6)

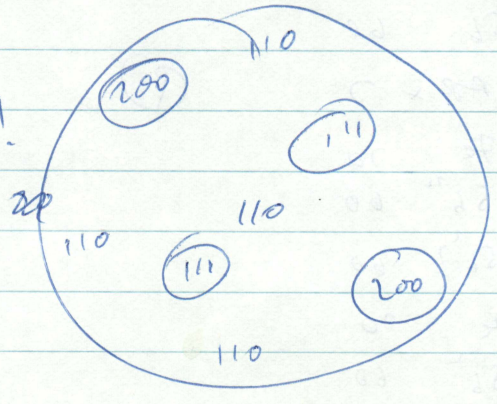
7.9 + 1.57 Me

ph just visible blurry — blurry under ph @ ~ 400 cons.

ph ×~6

ph Mspl

I think!



both
200
v ragged
& blurb.

Thurs. Some tip 60 /Ne.

— ph ×3 tip ×1 centre × 3 bolt 9.40KV (after evaporation)

~ 10 pins erupting rapidly — bright spots migrating — 12KV

— 5 pulse 12+2 — much less retention of spots.

— flushed.

Newtip — 5 tips SS tip from (3) days ago — 75 mins @ 485

ph × 3 or 4

T414 200/580 8.2 + 1.1 $\overline{1.28}$ /Ne off ? gob or pot

(moved) ph ×3 8.4 KV

more to dark area just right-of central pole

T415 200/580 8.2 + 1.28

+ 7000 cms

ph block

ph ×3

T416 New tape format — I hope!

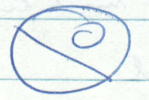
Fri 22 June Same ss Exp 60/No/810-10

ph blank

ph x 4 9.25 KV

IAP blank

IAP x7



Fe 61 490

C^{2+} 227 = 27

C^{+} 321 = 40

Al^{2} 340 = 42

Si^{2} 346 = 43

N_{29} 498 = 62

Cr_{25} 463 = 58

Doing line in

Fe^{2+} 60 sec 9.25 + 2

Al^{2+} "

C^{2+} "

Fe^{2+} [illegible] 9.25 + 2.4

Al "

N_a "

Al "

N_i "

Cr "

C^{2} v little

C^{2} -

IAP x7

Fe^{2+}

Al^{2}

Al^{2}

C^{2}

C^{2}

Fe^{2}

Cr^{2}

N_c^2

N_c^2

IAP × 1

IAP mufti

IAP × 3

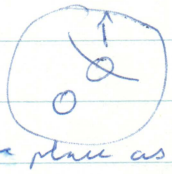
2.58
4.35

T417 off from bdary — 10K ions

New format 220/580 9 + 1.8

— not on bdary at 5000 ions — realign (? wrong ?)

& off at 6320 — move back



T418 away from bdary

~ 50–100Å below (~ same place as last IAP, ions.)

~ 4.40 9.2 + 2.1 240/580

— 9.5 + 2.2 10K ions off same place.

μh × 3 10.5KV : bri

μh assist × 4

μh × 1

μh Mufti

Sat 23rd

Modifying dispc/controller to try to get rid of false characters

~ interface

~ the box to try to stop it stopping.

Mon 25 June

Sun 55 Cup

T419 ~~Eff~~ bdary. 10.3 + 2 260/580 Ne/60 12 000 cm.

10.55 + 2

T420 Matrix 10.5 + 2 260/580 /60 Ne

2.18

13,600 → 10.8 + 2 270/580

— flushed.

26/6/79 55 as reid /60/Ne

T421 5·8 + 800 150/280
6·05 + 1·2
6·3 + 1·1 160/280
−1·4

10K cm
~ 2½ hrs - slow!

ph Mufish
ph x 3 – spotty! 7kV
IAP x 4
Fe^{2+} 67 = 550
: C^{2+} 32 255
C^{+} 44 360
Al^{+} 46 382
Ni^{++} 70 560
Cu^{++} 65 530
Fe^{2+} 50s
Al "
Al "
Al "
Fe^{2+} 30s quieter
Al "
Al "
Fe^{2+} "
Al "
Ni "
Al "
Mi – pur
IAP x 3
IAP x 3
Fe^{2+} 30
Al^{2+} "
Al^{2+} " – flashed
IAP Mush, ph black

SS long ht 60/No

Auto ph ⇒ 12-6 KV

emgt ph ⇒

More to go this ph ⇒

T422 240/580 12+2 2500 cms

ph ⇒ ? where 422

ph ⇒ aerial

Wed 27 Next day

μ blast

μL × 3

T42) 13.06 + 2 320/280 / Ne/60. 20K cells

11.08 → 13 + 2.2

μL × 4 ? spiral on 110

μL × 2 small amps

μL × 1 ~

μL × 2 ~ .

IAP × 3

small amplis, IAP × ~ 30×4

IAP × 3

Fe^{2+} 52 = 420

S ~~= 450~~

Al 300 = 36

$Al\left(\frac{14}{28}\right)^{\frac{1}{2}} = \left(\frac{1}{2}\right)^{\frac{1}{2}}$

45½.

1.4 | 640

86

80

30

1.4 | 420

Fe^{2+} 60 sc

Al^{2+}

Fe^{2+} 30 sc

IAP Mufti 2

Al 50

Al 4

Al ~

Fe^{2+} - myp 30

Ni 30

Fe^{2+} 30

IAP × 3

IAP × 3

Fe^{2+} 30s

Al 2

Al ~

Fe^{2+} ~

Ni ~

Cr ~

IAP × 3

ph x 1

ph Ruffs

ph x 2 2w

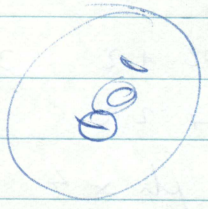
ph x 2 <2w

T ~~4424~~ 340/580/We from lower ppt near 110

T424 check aligned @ 8½K wins –

10K – bright edge to ppt.

ph x 2



T425 2.5 + 12.5 340/580 → longer pulse cos ↑ short/Ni

6K check align @ 3800 –

MAP x 2

Fe 30

Al 30

Al 60

Fe 30 ← 2 Al, Al, Fe

Ni 40

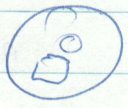
Cr 40

Al pop 60s

Al "

IMP x 2

ph x 2 4



5

T426 off ppt on bdry

– second win not enabled

2.5 + 12.5 340/580 1200.

T427 same ppt 1K wins

ph x 2 = IMP x 2

IMP Ruffs

Fe

Al

Al

Fe

Al 40s

Al^2 (

C^2 ²

Ni^2 .

IAP ×)

IAP ×) of split peak.

pH ×) - penalty.

going home time.

28/6/79 Same trip 60/Mo ~15KV line.

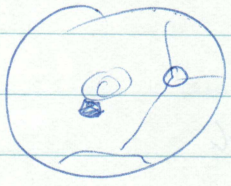
T428 from triple pt-on gb to right of ~~Fe~~ centre

340/580

13.9 + 2.5 → 2.3

3π comes

→ 13.86 + 2.38



pt x 3 15.4 KV. line

Zr^{2+}	44.5	=	265
Al	31	=	253
Si	32	=	258
Mo 47	60	=	475
Zr^{2+}	63	=	506
C^+	30	=	238

Zr	40
Mo^2	"
Mo^2	"
Mo^2	"
Zr	"
Si	32
Al	30 "
Si	32 "
Al	30 "

Zr	40
Mo	2 40
Mo	2 40
Mo	20

IAP x 3

IAP x 3 160 where γ was

pt x 4 pretty

IAP x 3

~~IA~~ Zr^{2+} pt

IAT Mo pt

Fe

Mo

(? Mo)

(? Al)

Fe

Al

Si

Al

Si

Si

IAP ~>

IAP all around. × ~ 10

IAP black

ph × 4

T 429 365/580

3.26 ph over small y' below centre 1 ω

4.52 check align @ 10K

— 20K im

more, ph × 3

ph × 2

ph ref ph 2

ph × 2 removed, dewar No pressure 16.2 KV

Fe 47

Al

Fe

Al

Al

Al

Fe

Ni

Cr

Al 26-27

Si hopefully! 20-1

Al

LAP x 1

LAP Nuclei

LAP x 3 or 4

Mn x 2 16-2 KV

HAP x 2 bright, bolder left of LAP pair.

Al 2+ ~60,

Fe 2+ .

Al 2+ ~2 ? pairs.

- flanked

LAP blank

pl blank

30
14 | 430
42

Meeting 4

Reproduced as said 55

Pl x 3 12-4 KV

LAP x 4

Fe 53 = 430

∴ Al 26

Fe 2+ 60,

Al 4

Al <

Al ?

Fe <

LAP x 2

More right LAP x 2

Fe 2+ 60,

Al 2+ 4

Al 2+ 4

LAP x 3

Mn x 2

5

0 ? gl

as rec ss

T430 300/580 avail /Ne/60

12.50 + 2.22 10K

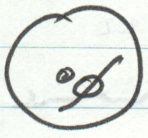
gradyhammel

29/6/79

ph × 6 – 2 guided on 40

T43F off from 2 gh

320/580 13·6 + 2·2



Ne/60 $1.5 10^{-9}$

T43E from dark area near 110

14·8 + 2·2 380/580

25K cm

ph × 2 16 KV

MAP × 5

Fe 2+

Al 2+

Al 2+

MAP Mg/Li

Fe 2+

Al 2+

Al 2+

MAP ×2

MAP ×2

Fe 2+

Al 2+

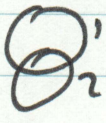
Al 2+

MAP ×2

Extracted.

~16 + 2·67

cm

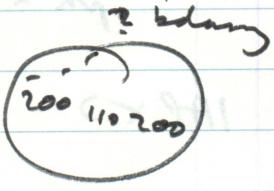


Mon 2 Sept Nov 750 min / 485 c 55 specimen.

- v off axis
- ph × 3
- arrays of bright spots on dark background.
- flashed

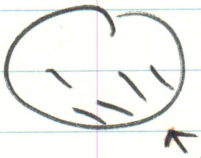
Newspec same material 750/485.

ph × 3 7kV



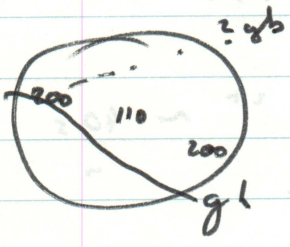
T433 ~~of~~ from 110 central 160/580
2K cins 6.4 + 1.3

ph × 2
more ph × 3



T434 170/580 6.8 + 1.2 from dark line near 110
11K 190/ — 7.4 + 1.6
ph × 3

ph × 1 and
ph Rayleigh 2
ph × 3

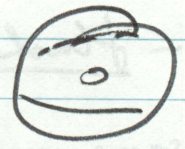


750/485

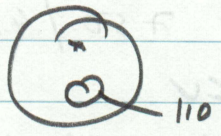
3/7/79 Same SS Lig 10^{-9} cold /60 /Ne

T425 200/580 from gb below 110 8.2+1.5 /Ne /60
12K – 210/580 and 8.7+1.85

M ×
ph × axial



9.27KV IAP ×



× ~ where 43+ yesterday

Fe^{2+}	62	500
Al^{2+}	42½	347
C^{2+}	27	231
C^{+}	40½	327
Ni^{2}	63	509
Cr^{2}	57	472
Si^{2}	43½	353

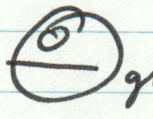
Fe^{2+} ~ 40s
Al –
Al –
Al –
Al –
Fe^{2+} – 4-5 planes

IAP ×

IAP × 4 or 5 small crystals ? pyrite ?

More down

IAP ×



gb where 475

Fe^{2+} 40s
Al^{2+}

IAP M/ph

Al^{2+} 40s
Al^{2+} –
Fe^{2+} –

Ca^{2+}

C^{2+} all gas low, ~ 9.2 + 2 kev + delay line

IAP >

Fe^{2+}

Al

Al

C^{2+}

C^{2+}

Fe^{2+}

~~Ne~~ Al^{2+}

Ne^{2+}

Cr^{2+}

IAP >

ph > around 9.8kev - pretty

ph > Cyg

ph > bott

IAP > other gb, rhs

Fe^{+} 40,

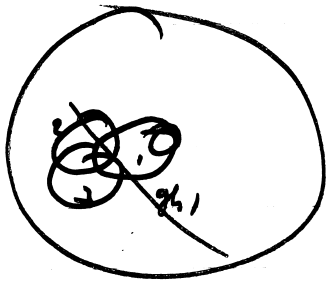
Al^{++} "

Al "

Al "

C^{+} " - v little

IAP >



More

— flashed.

ph blunt

Multip Sals $Ni^{+}Al/\gamma'$ 22kV ph x 3

IAP x 3

Ni^{+}

Al

Al

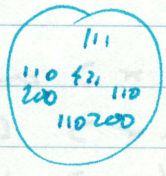
IAP Multph

Al,

Al

several — H.T height quenching — blew up amplifier — gave up.

Inserted Ni^{+} Al single stub for calibration purposes.



4/7/79

Ni_3Al single xtal – oddities
atoms/plane.

Next day $1\,10^{-8}$ torr (ugh) $2\,10^{-9}$ cold.

60/Ne

– stopping electronics – ? pulse getting into amp somehow
– put on extra earth, seems to fix it.

(2nd 435)
T435' near, not on, 110 210/580 8.4 + 1.4

152	7.82	1	300 5
160	8.99	1	301 4
4		1	302 13
5		1	303 3
199	12	1	4 1
200	113		5 1
201	160		6 1
202	5		7 3
203	1		361 44 1
218	16	2	969 1
244	20	1	
260	22	1	
290	265	1	
298	28	2	
299	282	4	
220		3	
241		71	
242		295	
243		113	
244		4	
245		2	
246		27	
247		98	
248		30	
249		7	

Al = 3 + 291 + 7 = 301

Ni = 3 + = 688

989 => 30.4% Al

7·68 +2 210/580 T436 — scrapped
(no amps dmd

Lots of H

121	1	161	7	296	14
126	1	162	9	297	64
130	3	163	10	298	41
132	3	164	6	299	6
133	1	165	8	300	4
134	3	166	7	302	10
136	2	167	1	305	5
137	1	168	2	304	1
138	5	169	2	307	5
139	1	170	6	329	2
140	4	171	1	330	1
141	3	172	3	327	1
142	4	174	1	346	1
143	2	175	2	347	1
144	6	176	1	351	2
145	10	199	10	354	1
146	14	200	62	360	1
147	9	201	121	362	1
148	10	202	11		
149	6	205	1		
150	12	20	218	2	
151	9	243	1		
152	15	244	1		
153	7	277	1		
154	14	289	1		
155	3	290	3		
156	9	291	4		
157	8	292	195		
158	5	293	118		
159	11	294	53		

— replace 2N3819,
— & readjust amps & discrim
to try to reduce noise & afterpulse
→ chevron set to 2·05 kV.

T437 78/210⁻⁵ Ne.

a		7.6+2		b	210⁻⁷ Ne	8+2		438	210/500
56	1	262	3	223	1	57 5	200 8	56 5	294 34
57	9	267	1	224	1	58 22	201 44	57 15	295 89
58	28	289	27 1	227	1	59 10	202 122	58 3	296 61
59	29	291	1			60 1	203 68	164 1	297 16
60	1	292	3			62 1	204 12	195 1	298 13
63	3	293	7 276			76 1	205 6	196 1	299 9
65	1	294	1			168 9 1	206 6	198 25	300 10
66	1	295	7			202 7	207 20	199 135	201 6
193	1	296	2			203 61	208 7	200 74	202 5
200	1	297	24			204 155	209 2	201 8	203 3
204	1	298	165			205 22	210 3	202 4	204 3
202	2	299	208			206 5	211 3	204 2	205 4
203	2	300	69			207 4	212 7	205 2	206 2
204	73	301	8			208 3	213 2	206 3	207 4
205	131	302	10			210 2	214 1	209 1	208 1
206	54	303	56			211 1	215 2	212 1	212 1
207	3	304	71			212 2 14.4	216 1	214 1	
208	3	305	33			221 1	219 1	216 3	
209	3	306	9			222 1 16	221 1	217 2	
210	2	307	12			226 1	222 1	224 1	
211	2	308	7			248 1	228 1	229 1	
212	2	309	8			281 1	617 1	274 1	
213	2 14.7	310	5			282 1		276 1	
214	2	311	4			287 1	~170	286 2	
223	2 16	312	1			293 5	170+	287 5	
224	1	313	4			294 9		288 11	
248	1	314	3			295 10		289 52	
249	6 20	317	1			296 83		290 280	
250	1	321	1			297 255		291 122	
257	1	326	2			298 160		292 51	
259	1	332	2			299 22		293 21	

210 → Nc 78

429 8.3 + 2 with

everything on amp restored

to original form..

0	1	297	23
86	8	298	12
57	28	299	10
58	2	300	12
59	2	301	7
165	1	302	4
197	1	303	1
198	20	304	1
199	148	305	5
200	87	306	3
201	13	307	1
202	5	311	2
203	1	313	1
204	1	318	1
216	1	328	1
218	1		
238	1		
274	1		
285	1		
286	2		
287	5		
288	9		
289	43		
290	282		
291	70		
292	53		
293	15		
294	29		
295	83		
296	65		

275 / 275 + 787 = 25.8%

210 → Nc 72

440 9.35 + 1.2 → 9.4 + 1.2

220/580

0	0	285	219
55	1	286	157
56	11	287	35
57	1	288	21
194	17	289	25
195	87	290	96
196	186	291	36
197	32	292	23
198	3	293	11
199	5	294	6
200	6	295	21
201	2	296	7
202	4	297	2
203	2	298	1
204	2	299	1
206	1	300	3
207	1	301	2
208	1	302	1
210	1	303	1
212	1	304	1
218	1	305	1
226	2	306	2
227	1	307	2
233	1	313	1
238	2	316	1
250	1	317	1
281	3	542	1
282	2		
283	10		
284	39		

346 / 346 + 738 = 32%

210 → Nc 78

441 8.9 + 1.7 220/580

343/782 + 343

0	0		
55	2	283	18
56	18	284	73
57	2	285	220
63	1	286	118
64	1	287	33
160	2	288	21
194	10	289	36
195	90	290	92
196	181	291	26
197	32	292	11
198	8	293	16
199	5	294	15
200	7	295	18
201	3	296	9
202	2	297	6
203	1	298	1
204	1	299	6
207	1	300	4
208	1	301	2
210	1	304	1
211	2	314	1
213	1	315	1
224	1	320	1
231	1	321	1
238	2	334	1
267	1		
280	1		
281	1		
282	3		

T442

Probehole over 220 centre.

1.85 + ~8.8 220/580 210^{-T} N_e

Kwiq ph x > where ↑

ph x > axial.

16·65

5/7/74 Next day $1\,10^{-9}$ / 60 / Ne.

420 – ~~[illegible]~~ alt planes

2 T443 220/580 8.6 + 1.9 $2\,10^{-7}$ Ne / 60

444 220

48 – reset on bright
140 dim
170 br
225 br
317 br
418 dim
493 br

T445a dim 220 planes only.
b brite planes only

6/7/79 Same N_2, Al – ? delay effect of cp vs cp volts.

220 aligned  – ? length of stage vs cp volts.

T446 a 60/Ne 210^{-7} 220/589 + 1·9 chevron 2·055

1k ions

b increase chevron to 2·205, nothing else changed.

T447 Same conditions a chevron 2·105, " – –

220/580 b 2·205 " – .

T448 a 9 + 2 (→ 9·15) 220/580 2·055 again.

b 9·25 + 2 220/580 -2·00

						Mean	σ
446 a	143	163	154	143	152	151	7·5
b	157	180	162	169	180	170	9·3
447 a	174	176	167	171	155	168·5	7·4
b	185	182	166	185		179·5	7·8
448 a	123	118	134	142	130	127	8·9
b	118	107	116	140	100	113	16
	89	138	100	111			

11/7/74 N., Al /60/ N$_2$ / 810^{-10}

T 449 test of prog 14 – output GDD without afterpulses

220/580 8.9+2 (afterpulses still on tape)

54	18	207	1
55	112	209	1
56	13	210	1
58	2	211	1
59	2	212	1
60	1	220	1
62	1	223	1
70	1	226	1
74	1	231	1
76	1	232	3
156	1	233	4
157	1	234	7
180	1	240	1
189	2	265	1
190	9	275	2
191	223	276	4
192	250	277	33
193	10	278	108
194	6	279	499
195	6	280	129
196	3	281	21
197	2	282	23
1984		283	132
1996		284	149
2001		285	23
2013		286	22
2021		287	13
2033		288	36
2044		289	23
		290	13
		291	4
		292	6
		293	10
		294	8
		295	3
		296	4
		297	1
		298	1
		299	1
		300	1
		302	1
		304	1
		307	1
		308	2
		309	1
		310	1
		313	1
		326	1
		391	2
		394	1
		398	1

T 450 from bright spot area rear III

9.2+2 230/880

IAP 110 × 3

N_i 60 = 480

$M_{(0.5}$ 327 = 41

2 × dim plume IAP

Ae^{2+}

2 × no dim - bright on typ IAP

IAP × 2 dim.

Al^+

IAP × 2 bright

IA2 × 2 dim

Al^+

IAP × 2 bright.

IAP × 2 dim

Al

IAP bright

IAP bright

Al

IAP bright

Al

→ dim

IAP Multiple 2

IAP dim × 2

Series superimposed Al^+ & 7nm pins.

— Al^+ from dim 220 planes.

IAP × 2

200 IAP × 2 br dim × 2

superimposed Al^+ & 7nm pins

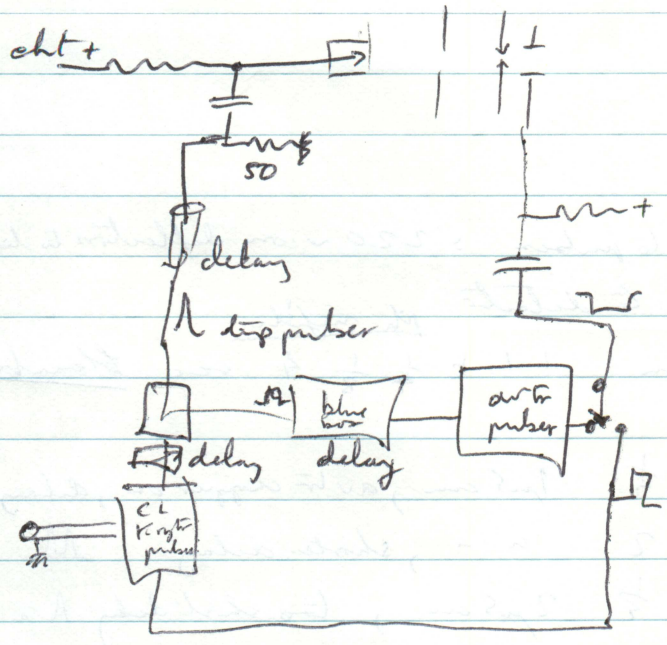
Al^+ from bright planes (only results OK! phew)

T457 240/580 1.45 + 2 from 200 start on bright plume

2nd channel locked out till ≈ 800ns so lots of spurious after pulses

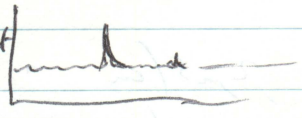
11.45

Sun 21–24/7/77 Attempting to discover effect of nS pulsing with an Ga source



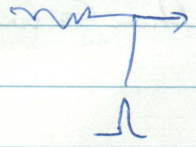
use either delayed tr. pulser
or delayed trig pulser
to gate tof spectrometer
– set delay for Ga^+, Ga_2^+
etc.
– av. tr better resoln.

– no gating,



– source now running at ~5KV after pulsing.
– ie as expected by Cathan.

4	2 μA	4.71
4.89	10	4.83
4.97		4.95
5.09		
5.23	40	5.22
5.37		
5.54	60	5.53
5.77		
6.07	80	6.02
6.37		
6.62	100 μA	



5.20KV 40μA + 900v ip to pulser : 220v on deflectors to let hi-energy ions thru to detector ph mpfth

.05 v/cm 1μS cm 1 1 ½ ¼ ⅛ 4 cm blank

.05 3 1 ½ ¼ 1μS cm, av to chopper on, delay for Ga^+

" ¼ ½ 1 2 " ", shorter delay

½ 100μA 2 1 ½ ¼ 2μS cm, too short delay Λ & Ga_2^+

40μA ¼ ½ 1 2 2μS, av to off, biased for hi energy.

blank

5.15 40μA + 1.9KV 2 1 ½ ¼ 2μS/cm " " " Ga^+ & Ga_2^+

" " ¼ ½ 1 2 1μS/cm " " " " "

2 1 ½ ¼ ⅛ 1μS/cm " ", hi & lo on detector

Ga^+

– t of 6.2μS, spread 1.5μS → broad peak.

blank

1, 1, 1 av to on, varying delay.

ph Mpfth 2

1 1 1 1 1 delay → longer A > Λ

1 1 1 1 1 delay → shorter < A Λ — bias set better.

2μS/cm 1 1 1 1 Λ Ga_2^+ 2nd Ga_2^+ peak going left with delay.

2 Ga_2^+ - some

blank

100μA 6.2 + 2.5 ¼ 1μS/cm both i_{dc} + i_{pulse} — v broad ph.

¼ ½ 1 2 v bias hi e only — not any Ga^{2+}

¼

fit μs pulses,

40μs — 5·19 + 600v ? 70μs pulse

2 | ½ ¼ 10μs/cm .05v/cm.

50μs/cm ¼ — grün ~ 0.4/cm — deflector ingrowed.

Multi

¼ ± | 2 50μs/cm, .1

pulse before coupling cap.

2 1 ½ ¼ 50μs

¼ ± | 2 10μs

— checked with 200μf cap probe to other side of coupling cap — 3 μs, but dodgy connection

— pulse ⊓⊔ ok.

1·1μs Δt

$\frac{1}{2} m \frac{L^2}{t^2} = nE$

$\frac{\Delta E}{E} = \frac{2\Delta t}{t}$

E = 5.15

t = 7.2

$\frac{2.1 \cdot 1}{7.2} = \frac{\Delta E}{5.15}$

$\Delta E = \frac{2.2 \times 5.15}{7.2} \sim 1 \ldots$

Tue

31st July 79

Same Ni, Al

T452 using new prog => masses in DD & on lightly.

Tig extracted — OK at ~10KV

SAH Ni Al/Ti as quenched 9 4½ at 2o

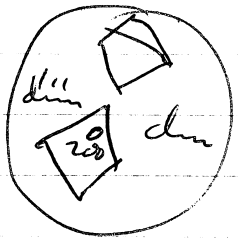
60°, ~8KV, Ne, ~210⁻⁶

ph × 4 7·5KV

T453 170/580 6·8J + 1·4 + 1·5 810⁻⁶ Ne.

1K ions.

ph × 4 where 453



T454 from dim region 170/880 1·5 + 6·8 210⁻⁶ Ne.

1200 ions 1·15 8·85

ph × 2 where 454

ph × 2 after de-expn, 7·5KV ?

blurry across top 200.

Wed

1/8/79 Same thick Ti $\leq 1 \times 10^{-9}$ / 60 / Ne

ph x4 8.5 KV

IAP x3 — bottom 200

$Ni_{2966} = 540\,nS = 66$

$\therefore Al_{13.5} = 370$ 45

$Ne_{20} = 450$ 55

$Ti_{24} = 491$ 61

$Ti_{16} = 401$ 50

$H_2 = 12$

Ni 40,

Ti 40,

Al 40,

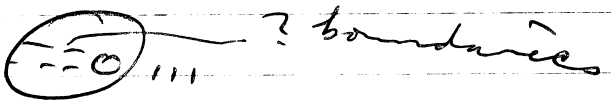
Ni 40,

Ti - ? slightly up ?

Al 4

IAP x3

More right IAP x3



IAP Number 2

Ni

Ti

Al

Ni

Ti

Al 8.6 + 11.98

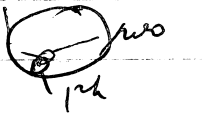
IAP x3

ph x3

1455a 7.76 + 1.9 200/580 2×10^{-7} Ne 80

from bottom 200, bright area

1200 ms



again — ph x3 where 455a

more to dark side of 200 ph x1

2

ph Mafilm

ph × 2

T455b 7·6 + 1·9 200/580

2 belts aligned – must – fusion cable rate.

– from dark side of ~00

→ 7·85 at 1200 as 550 of them H+

ph × Provisal

T456 axial, dark hole on (220). 8·8 + 1·9 220/580 vac

→ 9·5 + 2 230/580

– ~11K cnts @ 3K/hr – v slow & would've sped up (rate ↑↓)

– occasionally producing flight-L = 0, writing m/n e = 0

– reloaded prog @ ~ 6K cnts – still did it.

~ ½ day spurious cnts before tape reads 230/580.

5

2/8/79

Thurs Some MAlTi Cyp.

Div 10.17 ph blank

ph x 3 Div — ? boundaries - fuzzy pulses.

+ Spuke ph x 3 poorly.

IAP x lots 1+1 5+5 10+10 bit less than Div

Back to ~~100~~ 110 lbs ? b'dary

x 3

+ Spuke — 200 ordered

IAP x 2.

complete IAP x 3

Mi 40s ~~20~~ gas out

Ti 4 "

Al 1 "

Ni 30s fault "

Ti 1 "

Al 4 — 10.8 + 2.3

IAP x 2

IAP Nofish 3

IAP x 2

IAP x 6 small evapn, ? b'dary across top 200 110

- to 200 IAP x 2

IAP x 2 sol getting out of tune.

Ni 30

Ti 30

Al 15s.

Al ← changed pulser ht set was unstable

Ni

Ti

Al

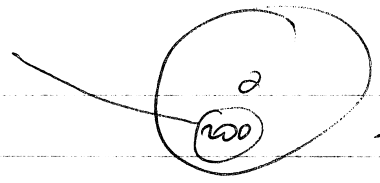
Al

Ti 4-5 planes

Ni 11.5 + 2 ⊃

1AP ×3

ph ×3



— lot of dark areas.

1AP ×3 axial 220

dark hole

N, 30 s

T, "

Al "

N, "

T, 1

Al "

T, 4

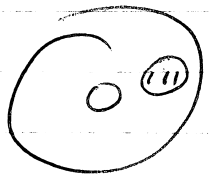
1AP ×2

1AP Nuph 4

1AP ×2

ph ×3

to 111 1AP ×3



— hyston gone home.

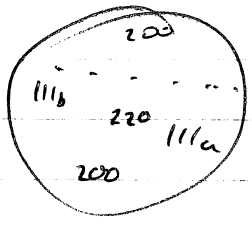
1AP blank

1AP ×1

ph ×3 bottom 2

ph ×3 ~~middle~~ top

ph ×3 ~~top~~ middle

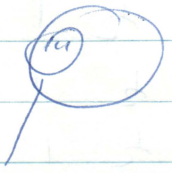


2 bdamy

— dark line 111b doesn't look right.

3/8/79

Pri 810⁻¹⁰ Ni Al Ti still
μh × 3 70K ish
14 IAP × 3



11·6 + 2·5 [— klystron replaced, charging cap now 1 × 220, not 2 × 220 pF]

Ni 40,
Ti "
Al "
Ni ~30, finish
Ti
Al ~40
IAP × 3
μh × 2
μh Mg/Ba 3
μh × 2
IAP × 3 200 ? ordered

Ni
Ti
Al
Ni
Ti
Al
IAP × 3
μh × 3

Pulse on scope (Tektronix 475 borrowed from Supercon)
— with 1 charging cap only — longer with two
vert 5 v/cm, ÷16 attenuation (Kennards), 590v input to pulser, 110Hz
½, 1, 2, 4, 10 10nS/cm
½ 1 2 4 10 1nS/cm
2 4 10 1 1nS " brighter scale illum
1 2 ½ 10nS/cm " "
1,1 "
cp pulse via microscope & ÷16 attenuator, 3200v ip to pulser

short cl ½ 1 2 4 10 10 nS/cm 1.5 V/cm
½ 1 2 4 10 1 nS/cm
½ 1 2 ¼ 10 nS/cm,

long cl ¼ ½ 1 " "

Mr Kinfish 2

" " 1 2 4 " "

" " ½ 1 2 4 ⅛ ¼ " " not via c-p, separate attenuat

½ 1 2 4kV pp 2V/cm " "

short cl ½ 1 2 1 1 " "

" " ½ 1 2 2nS cm

Tip pulse via delay line to mainscope, from mainscope attenuat
½ 1 2 4 10 ½ 10 nS/cm 5 V/cm,
4 1 ½ (?) 1 nS/cm

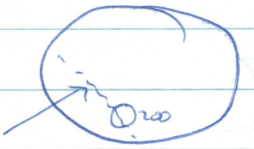
Tip pulse " " + cp pulse via separate attenuator,
added in scope ½ ¼ 1 2 4 10

Prof Kongo Osamura 11 or Tues.

Mon
6/8/79 STAC esq Ni Al Ti still 410 Comp 10 (110 diffusion 60 / Ne

ph Mfish
IAP Mfish 5

ph x 5 – wrong f.
ph x > DIV 12.6 KV
ph x > < DIV 11.5



IAP x > 200 ?

edge of γ'/γ interface

Ni 52 = 420
Al 24 = 286
Ti 46 = 282

12.5 + 2.5

Ni 50 s
Ti 60 "
Al 60 "

⇒ longer charging time.

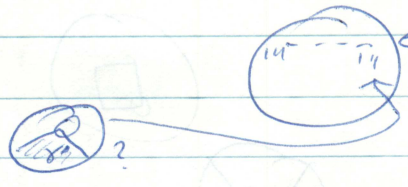
Ni 50 s
Ti "
Al "

IAP x >

Move slightly IAP x >

Ni ~8 planes 50 s
Ti "
Al "
Ni "
Ti "
Al "

IAP x >
ph x >



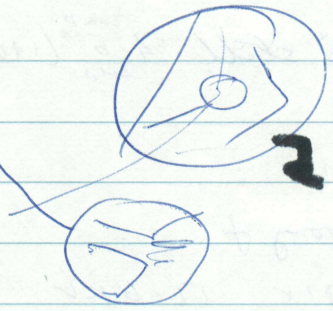
Top III IAP x >

Ni
Ti
Al
Ni
Ti
Al 13 - 9 + 2.65

UAP x 2

ph x 6

IAP nasal x 2



2

M1

T1

AL

UAP Nasal 6

N1

T1

AL

UAP x 4

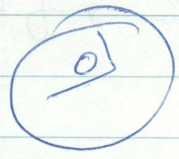
ph x 2 D2W

ph x 2 CDW

ph x 2

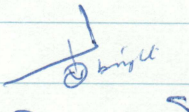
T457 x 12-6+2·6 320/580

2K (gas out)

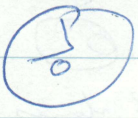


b

2200 Ω



bright



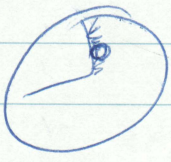
2 x ph where b

2 x ph where a

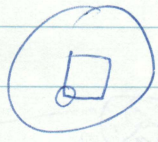
2 conversion

T458 12-7+2·6

320/580



ph x 2 CDW



μ x 4 D1W

IAP x 4

1

N1

T1

AL

IAP x 3

50s - switch

run

gas present N_i 40,

T_i "

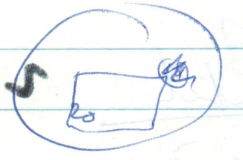
Al "

N_i " ~8 planes

T_i "

Al "

IAP ×3 14.5 + 2.6



Move IAP ×3

N_i

T_i

Al

delay line out

N_i

~~Al~~ T_i

~~Al~~

Al

T_i

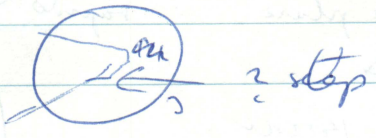
N_i

IAP ×2

IAP [illegible] 7

IAP ×3

IAP ×3



M

~~Al~~

~~Al~~

M

~~Al~~

~~Al~~

IAP ×4

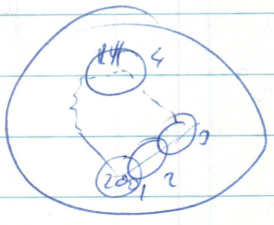
to [11 at top of IAP pins

IAP ×3

N_i 30,

T_i "

(IAP)



Al

M_2

T_c'

Al 2.75

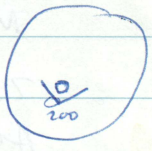
(App x) 13.86 KV

ph x1

ph Mg ph 2

ph x3'

T 459 from inside corner of ppt on 200

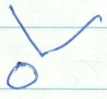


12.67 + 2.73 Gas present

2500 (800 H)

T460a 12.87 + 2.65 > 30/580

2500 cm

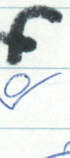


b back to 3 y'

- well inside gas + kit-down 12.95 + 2.65

ph x3 where 460b

T461 13.21 + 2.6 > 30/580



~ same plane rapido

4700 cm

ph x3 14.2 KV

going home time.

12.9 Al
4e2+
14496 Ni

12.6
9.4
2370
1438
256
1771

14 Al
50
1628

7.9
2+

7/8/79

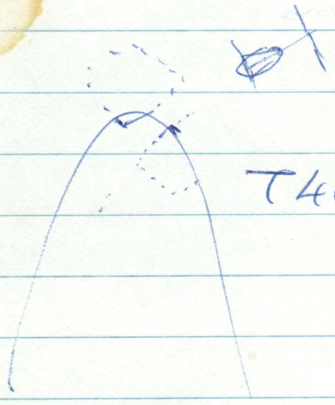
8.1

Tuesday Same place $P_{H_2} \sim 10^{-9}$ /60/Ne.

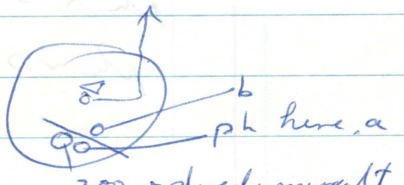
T462 330/580 12.6 → 13.25 / 2.7 [Ne] at start
19K in
ph ×2

T463a 330/580 [13.00 + 2.7
13.25 — break for lunch — ~2 hrs @ ~4K
Prof. Koyo Osamura (Kyoto Univ. of Industry) to visit

b 13.50 start 13.90 → 13.25 — 330/580 lot of H @ beginning — O
ph ×4 where b



T464a 13.6–13.8 330/580
from bright area near 200 2K
b from dim area 2K
ph ×2 where b
ph ×2 lhs of tip
ph ×1 rhs
ph unfilter 3
ph ×2



T465 from bright dim 13.9 → 14.2 @ 330/580
ph ×2

18

Ord 6/8/79 110^{-7}/60 /Ne

SAH Melt-spun wire – allegedly Ni Al but probably Ni Cr Mo etc

ph blank

ph ×3 13.85 KeV just after oxide ripped off.

Scraped, ph ~3 some poles 14.9 KeV

ph ×3 < 3IV 12.6 KeV

T 466a from bright area in middle 13.00 + 2.7 320/580

b – edge of dull area to left

467 from dark area 13.3 + 2.7 330/580

– 13.9 20K cons

ph ×3 when 467

ph ×3 as rod

C

Fri

Thumbers pulser 24 cm × 1.5 mm stainless (~4 ns
on Tektronix scope (hand held!)
10 & 1 nS / cm 5 v / div 485 v ip
+4 & +1.9

Mon 13 Aug SAH melt-spun Ni Al (recharge)

- prep 11.5 KV 4x ph

decrypt. - 12.5KV ph x 3

ph x 3

60/Ne ~ $5 10^{-10}$ — discovered lots of Ne (quadrupole)

T468 ~~12.00 +2~~ 290/580 ~ axial, bright area

-12.4 + 2.1 300/580

- 12.7 kins

ph x 3 where 468

and ph x 4

IAP blank

IAP + dog

- ? gb

Ni 2+ 40

Al 2+ 40 ~ 13.1 + 2.65 -

Ni 2+ 50 ~ max

Al 2+ 60

IAP x 1

IAP blank 2

IAP x 3

More Rhs IAP x 3

Ni 50s

Al "

Ni 4

Al "

IAP x 3

~ axial IAP x 3

Ni

Al

Ni

Al

IAP x 3

ph x 3

Tues 14 Sun M'AC Sq.

ph x4 (last < bin) 13.4 KV Ne/60

ws probe

ph x 3

bolton 200 IAP x3

N. 40

AC "

Nc 60 ~6-8 planes

AC "

IAP x3

ph x 4

IAP x 1

black hole left of 200 IAP x 3

N. 60? var

AC " 15-3 6 + 2-7

N. "

AC "

IAP x 1

IAP Nafish

IAP x3

IU legs left - IAP x3

N. 6 planes 60s

AC "

N. 5 1

AC "

IAP x 3

ph x 3

T469 Orsiel 220 370/580 15-1 + 2-63 var

~2 v slow @ 14 K, appeal ~ 400v

24K -> 15-7 + 2-63

ph x 4 - warm

extent

15/8/79

Wed

New lig N, Al Ti ex SAH – new batch ? better quenched

70/Ne ph Mapham

ph x ⊃ ~26·5 KV after prop – ? cycles

ph x ⊃

ph x ⊃ after cycling . 8 KV

T 470 Axial, close to 200 centre : vac 8 + 1·6 200/580

22000 cm → 8·6 + 1·8 210/580

ph x ⊃ ? γ' in centre of ico

IAP Shah

IAP 200 x ⊃

ph x 2 reduced after 2 cycles

N, 65 = 500

∴ T, 480 s = 60

Al 362 = 44

N, 45 s

T,

Al

N, 45 s

T,

Al

N, 60 s ? ~5 plumes.

T,

Al 9·16 + 1·95

IAP x ⊃ – γ' ⑩

IAP x ⊃ 65 hrs ⑥

N, 66

T, "

Al "

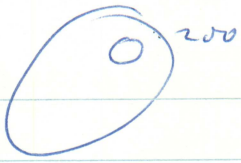
N, 50 ~10 plumes I think

T, "

Al "

IAP Mapham 2

IAP x ⊃



Move IAP x 2

M1 50

T1

A1

N1 45° finish

T1

A1

IAP x 2

ph x 2 - melty

IAP x 2 bolton left 111

N1

T1

A1

N1 5 planes in 50s

T1 "

A1 "

IAP x 4

bolton 220 IAP x 2

N1

T1

A1

N1

T1

A1

IAP x 2

IAP Nufab

IAP x 2

ph x 2

T4R 240/580 9.75 + 2 run on 200 ? reduced bit

-10 +2 rapido! 7 K / 25 mins

Johnny home time

Mexting

T472 250/560 vac 9.67 + 2

~36K

T473 250/560 10.15 + 2

-260/560 ⇒ 10.5 + 7.4

ph x 2 where 472

ph x 2 < bin

ph x 2 DW 11.49 KV

extract.

ph blank

17/8/79

Zr

PFM Melt-cast cracked — — — heat treated — —

60/Ne

ph x1

ph Multiple 2

ph x3

NS, pulse, ph x3

? bands

T474 a 200/540 8 + 1.4 brightness → ? Ne

−8.15 + 1.65 ~ 2K Sidamp dient

b over darker area −8.25 + 1.55 wk

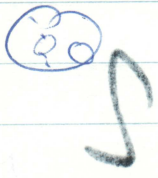
~2K

ph x3 where b

ph x3 axial

IAP x3 or 4

MS pulse IAP x2



Ni 65 = 530

AC² 362 = 44

Tc²24 482 = 60

Cr²26 502 = 62

Mo² 675 = 102

Cu 341 = 42

Ni 60s

Cr "

Al "

Ti "

C - ? 41 "

Mo Ni "

Ni "

Cr "

Tc "

Al "

? C - not sure

Mo " 8·8 + 1·54

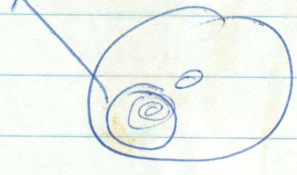
M18/F1

IAP x>
MAP x> ?200 austnd
Ni 60 60s
? Ti
– change to short cd –
[Cr – v little 61-62]
[Ti 60]
Al 42
C 40 – v little
Mo 102
Ni 62
Cr – recalculated 57
Ti 55
Al
Mo
IAP Nafila
Mo
IAP x>
ph x>

5

I think Cr

2



lunch

T475 230/560 var 9.3 + 1.7 from dark area @ top.
4.6K 9.7 + 1.75
ph x>
anal ph x> <3.v
anal ph x> 3.v
ph x 4 – ppt

T476 from ppt 9.4 + 1.7 230/560 var
still ok @ 200 – 9.7 + 1.9
redign @ 545
ok @ low
OK all thro 2.5K

Mk ⇒ < DIV

Mk ⇒ Div

Mk ⇒ ~ Div ~ 10 KV

IAP ⇒ 5 carbide

Ni (matrix) 60	480	= 60
C^2	218	= 26
C^+	308	37
N^{14}	334	41
Ti^3	357	44
Ti^2	407	54
Cr^2	455	56
Nb^3	496	62
Mo^2	611	75
Mo^3	519	64

delay line in gas out

C^+ 60 sec

N^+ (HE)

Ti^2

Ni^2 4

Cr^2 1

Ti^2

Mo^2

Ti^3 1

Nb^3 + tail of Ni^2 10.35 + 2

IAP ⇒

Move IAP ⇒

C^+

M

Ti^3

Cr

Ti^2

Mo

Nb

$|A\rangle$

$|A\rangle$ 3

$|A\rangle$

$M_z = \frac{1}{2}$

μ gone

Sat 13/8 Some APK1 heat treated

pk x 1

pk Mfich D +

pk x 2

IAP x 2

IAP x 1

IAP x 1 10 7

Ni 57 = 470 = 57

Tc_2 = 427 = 53

Cr_2 = 445 = 54.5

Al_2 = 220 = 40

Mo_2 = 601 = 74

Ni 60s

Cr "

Ti "

Al "

Mo 120

Ni 60s

Cr "

Ti "

Al "

Mo "

Ni "

Cr "

Ti "

Al "

MO 120s

IAP x 2 DW

IAP x 2 < DW

IAP x 2 RHS

IAP x with pulse

N_2

Cr — flush

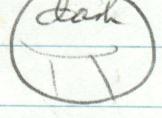
IAP x 1 OK

11.6

11.6 + 2-16

IAP × 2 10.8 nv

TR Ni 60,
IAP Mo/Ti 4 C

~~HT~~ Cr
Ti
Al
Mo
Ni
Cr
Ti
Al
Mo
Ni
Cr
Ti
Al
Mo 14.5 + 2.4
IAP × 2 10.98
ph × 2
ph × 2 + pulses
ph × 2 < DW
move ph × 2 < DW
(break)
IAP × 2 area @ top  10.8
Ni 60,
Cr "
Ti "
Al "
Mo "
Ni "
Cr
Ti ^
Al v

MD 1605 15 + 2.6

IAP x 2

ph x 2 initial

ph x 2 < bw

T477 a from dark area RHS of ph 340/560 ~~9.8 = 4~~

var 2K - some white under ph 13.5 − 13.9 + 2.6

b from adjacent bright area − 14 2.4K

T478 bright area, axial 340/560 14.2 + 2.7 var

~30K shw − 14.45

ph x 2 @ 14.45 where 477

ph x 2 @ 15.25 ~ DIV

Mon 20/8/79

Fe /12 Cr /.8C ex S.V. Wood melt extruded as rcid
, should be 479

T478 210/560 vac / 78 8.5 + 1.5

ph blank

ph x 3 where 472 9.67 — galloping H!

IAP Method 1

IAP x 3

Fe $^{2+}$ 60 = 480 = 60
Cr^{2+} 460 = 56
C^{+} 915 = 37.5
C^{++} 220 = 26

Fe 60 vac
Cr -
C^{2} -
Fe -
Cr -
C^{2} -
Cr^{2}
C^{2}
C^{2}
Cr
Fe
Cr
C^{+}
C^{+}
C^{2+}
C^{2+}
Cr^{2+}
Fe^{2+} 10.6 + 1.96
IAP x 3

IAP x 3 avoid

7e
Cn
C2
C2
7e2
C2
C2
Cr2

11+2

IAP x>
Max 3
IAP x1
IAP Mute
avoid IAP x>

2

7e 60s
Cn
C++
C++
Cr
7e 11-5 + 2
IAP x>
Move down
IAP x>
7e 60s
Cr 1
C2 1
C2 1
C++ 1
7e2 1
C++ 120s, Taunt
IAP x>
Mu x2
Mu Mirror

C

? Mu x3

T480 + 1.8 260/560 vac

~10K, axial

μ×2

μ×2

- extracted

μ blank

Newspecimen APK1 20min @ 750°C.

Nc/78.

T481 ~axial 10.15 + 1.5–1.75 240/560 vac

2K μ×2 where 48

VAP blank

VAP ×2 ~axial - splits.

- μgr - ox

VAP ×1

Ni² 60₂

Cr²

Ti²

Al²

Mo²

Nc

Cr

Ti

Al

VAP Anfang 3

Mo²

Al²⁺ 10.4 + 2

VAP ×2 10.1

μ×3

VAP ×2 top left

polish to 2.5

Ni 60₂

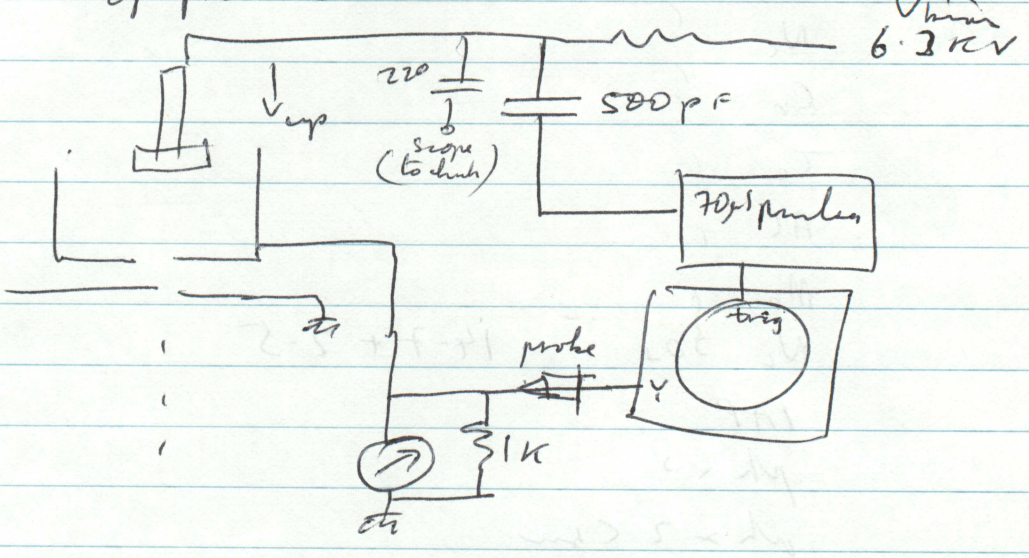
Cr

8/15

T_i
Al
M_b
N_i
C_r
T_c
Al
M_b
N_i SO_3 14-7+2-5
IAP
$\mu h < 3$
$\mu h \times 2 < b_w$

2/8

70 μS pulses — op from collector



1KV +6.3 50 μS/cm .05 × 10 = 5 mV /cm .

~4 × with source running

~4 × source below $V_{threshold}$ — capacitative coupling

increased V_{bias} to 10.46 KV

~5 ~ ~ +1 KV

6.5 + 2KV pulse — noisy

6.5 + 2 KV × 5

< V_{min} + 2 KV × 5

↑ .05 V/cm (no ×10)

5 × 4.70 KV + 2KV pulse

↳ no i_{DC}, just i pulse . !

×10 24.7 + 2KV pulse 50 μS/cm

6 " 4.7 × + 3KV pulse

3 × 4.28

3 × 4.40 + 3KV

~6 × 6.24 + 3KV →. source turning on again

after ~ 100 μS

517 + 2 , 0.2 mS/cm

1× noise 5μs/cm.

pk Mg pk

13

~6 × 5μs – noise during pulse

50μs/cm, .05 4.63, 4.76 5.20 6.0 7.3 8.5 8.9 9.27 blank

+ 1KV pulse – development of pulse noise, switch off of beam.

3.8×20 ms between pulses ≈ 76 ms ⇒ 12 Hz

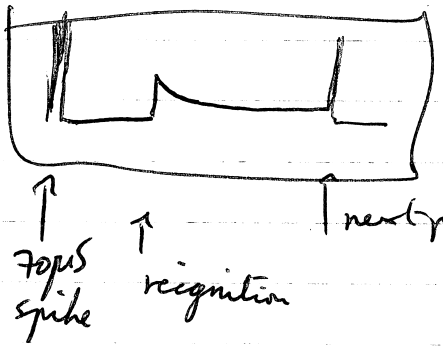
pk blank

22/8/79 Ga source

as before, 70μS 1KV pulse on top of ~5KV

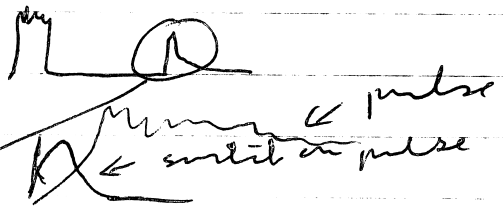
4.75 + 1 10 mS/cm .005 V/cm ((x10))

=>



~ 6 or 7

~ 4 or 5 1 mS/cm



3 or 4 @ 0.5μS/cm

~ 4 single shots 0.5μS/cm,

Dill i ar = 25μA, 4.8 + 1KV => ~ 6 × 25μA in pulse = 150μA.

100μA 5.8 + 1 $\frac{4-5}{1.2} \times 100 = \sim 400\mu A$ - noisy

30μS noiseless => 1 cm high } 100μA ~ 1.2 cm.

70μS + noise - 4-5 cm high }

22/8 Lynn Swanson visiting

6202

24/8 APK1 as acid ~~as~~ 60/Ne / $<1\cdot10^{-9}$.

~~ph Mesh~~

ph × 3 ~ 10.5 KV.

ph × 3 after 45 pulsing.

T482 arrival, ~~as~~ 11 + 2 270/560

~ 3 K

ph × 3 11.5 KV shows 482

IAP Mesh 1 5

IAP ·

IAP × 2

N_c 60 s

C_r

T_c

Al

M_o

N_i

C_r

T_c

Al

M_b

N_c

C_r – pop

C_r

T_c

Al

M_o

N_i + 2.2 KV probe

IAP × 3 12.25

RHS IAP × 3

N_i 60 s

C_r "

T_c "

Al "
Mo "
Ni "
Cr "
Ti "
Al "
Mo "
Ni "
IAP Mufla 2 1
Ni " 13.5 + 2.2
IAP x 3
ph x 2 12-3 KeV

T480 nasul 320/560 vor 13.3 + 2.2
ph x 3 13.6 + 2.5 320/560
ph x 2 :
ph blank

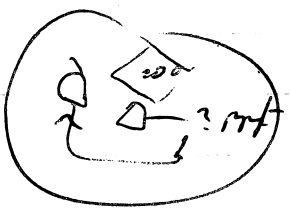
— Extrait

2418

New Lig Subs Ni/Al/Ti 5hr @ ....

ph x 3 7.5 KV

ph x 4 <DIV 6.5



IAP blank

engt to 8.5+ KV

ph x 2 mpt-to left, under

200 ordered — IAP x 3.
~ axial

N, 60, 8.5+1-5

Ti

Al

Ni

Ti

Al

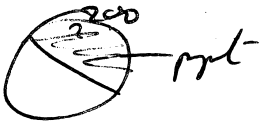
M

Ti

Al

IAP x 2

IAP x 3 bottom of mpt



Ni

Ti

Al

Ni

Ti

Al

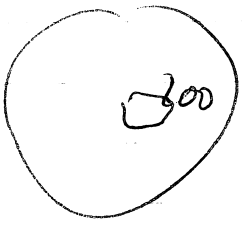
IAP x 2

IAP x 1 <DN

ph x 2 <DW

ph x 2 8.8 4

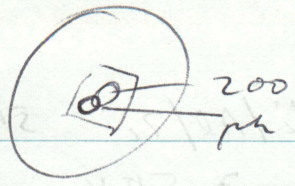
going home time.



25/8/14

5% Ni Al Ti

Nestdy ph x2



T484 8·5+1·7 220/560/rm /60

⇓ 20K — 8·95 + 1·88

485 8·9 + 1·88 230/560/rm/60

~30K 9·3 — 1·95

µl x 2 — ppt made pH 1 thick

more µl x 2

IAP Rinse 3

IAP x2 bottom left (ppt)

Ni 60=480
Ti 57
Al 31

Ni 60
Ti }
Al }
Ni }
Ti }
Al }
IAP x2 — ppt — moved left
IAP x2
Ni 60
Al ⟲ }
Ti ⟲ }
Ni 60
Ti 120
Al 60
IAP x2
Move right IAP x2 (>) ?
Ni 60,
Ti }
Al }
Ni }
Ti }
Al }
IMP x2

? Tc rapido!

~~NC~~

~~TC~~ AC

TC

IAP Mapk 04

NC

TC

AC

IAP x 2

NC 60,

TC 1

AC 1

AC 1

AC 1

NC

TC

TC 1

TC

TC

IAP x 2.

Mk x 2

Mk Mapk

Mk x 2.

small stimulus sequences per pin to look for duplex stimulation — ? 20->20 AC/TC areas

?

Mon 27/8/79 Same N. AC Tc 5hr

60/N.

Mk x> @ 11.1 KV (exactly ~ 60 Charges before)

IAP

N. 60s

T.

AM

N1

T.

AM

N2 Tank

T2

AC 11.8 + ~

IAP x>

de crypt IAP x> ? bright-

More right- IA x>

IAP Mgt 5

AC 60

T.

N2

AM 10

AM

AC

T.

T.

T.

N.

IAP x>

More right, up, IAP x>

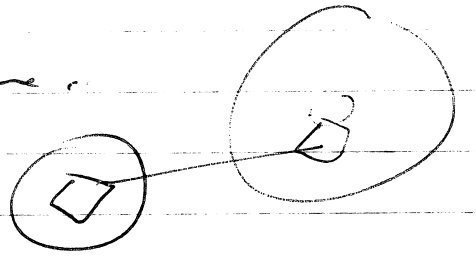
COW is

08

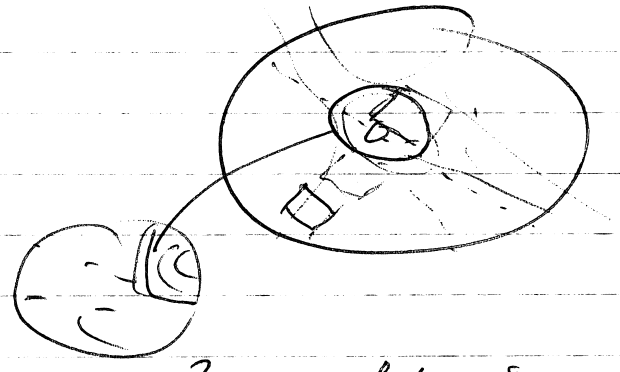
N.
T.
AC
N.
T.
AC
IAP x>
<DW IAP x.
pl x 5
IAP x>
AC 60 sec
T. "
N. "
AC 30 feet
T.

IAP Number 6

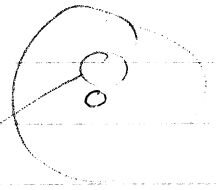
N.
T.
AC
N. 30, fast
T.
AC
(2N. T. AC)
IAP x>
IAP x> same plane.
pl x>
IAP x>

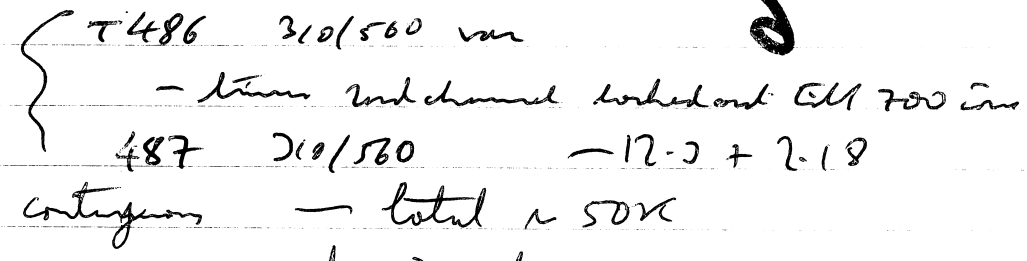


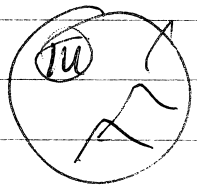
AC
T. — v little
N.
T.
AC
N.
T.
AC



? rows of tongue-soft







Al

Ti

Ni

Ti

Al

Ni

Ti

Al

VAP × 2 or 3

M × 2

VAP × 2 top r

Ti very rigid!

Al

Ni

Ti

Al

Ni

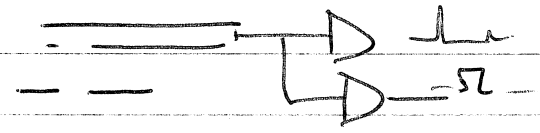
Ti

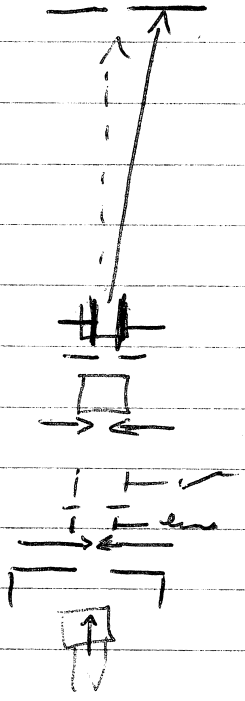
Al

VAP

Int

Break for Berlin IFES, holiday,
exp. with N-laser, assembling deflectors & rebuilding ALT deflector PS
for Cathan machine.





Wed 17 Oct 1979

Gu source with new deflector system
ph camera, tail end of IAP film - blank -
5.96 KV / 60 μA on collector

2 μS/cm - digital amp $\frac{1}{2}, 1, 1, 1, \frac{1}{2}, 2, 4$ (+16' , +4)
" " analogue amp $1, \frac{1}{2}, \frac{1}{4}, 2, 4$
×10 2, 4

Lens 1.00 KV
deflector bias 310 v deflector sweep/amplitude 770 v
Bendix 2.30 KV
~ 3 mS between pulses

Thurs 18

from cesium timer

a) with delay set short – so Ga^+ peak emphasized ($\& Ga^{2+}$)

b) with delay lengthened after a few secs to get rid of Ga^+ & less, & after ~1K secs to get rid of Ga_2^+ as well (ie to emphasize heavy ions.

Mass scale set to show mass 70 as ~15, to get masses up to ~ 500 on onto IAP plot of m/ne.

(6KV fed in as 020 (as if IAP helipot setting)

– spectrum much noisier than yesterday – ? why.

– less sign of Ga_4 & Ga_5^+ which were clearly visible above the noise yesterday, unfortunately tape not punched.

19/10/79

Sweeping AP K1 / 5min / 750 / (multigun)

Ne / $<10^{-9}$ / 60

< DIV 11.25 µA ×2 (cullen/thrombid)

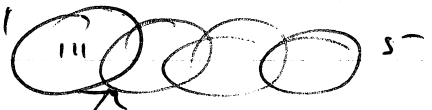
DW 12.5 µA ×2

NSpulse 12.5 + 2.2 µA ×2 — lungs.

IAP Mesh **1**

IAP × 4 or 5 arrows top

IAP ×2



Ni	54	440
Cr	51.5	416
Ti	50	400
Al	26	200
Mo	67	550

Ni 1min 13.96

Cr "

Ti "

Al "

Mo 2 "

Ni 1 "

Cr dust 1/4

Cr 1min

Ti "

Al "

Mo "

Ni fusion "

Cr "

Ti "

Al "

Mo " 13.96 + 2.05 van

IAP ×4 13.96

IAP × 2

N_i

C_r

T_i

A_l

M_o

N_i

C_r

T_i

A_l

M_o

N_i — pop.

~~IAP~~ IAP × 2

IAP multiple 2

IAP × 2

ph × 2 ~ 15.5 rev.

ph × 2 < DW

IAP × 2

IAP × 1 < DW ~ central.

N_i

C_r

T_i

A_l

M_o

N_i

C_r

T_i

A_l

M_o

IAP × 2

ph × 4 — modulated

~15K T 389 410/553

accident

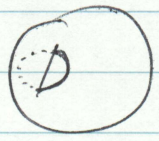
var 17-17-2 + 2-7

Fri 19 Same APK1/5 min 700

TD

T490 420/560 – labelled 410/560 cos eating better

– tip moved off axis so less ions plane through



detector

17·4+2·7 var.

2

Th source again

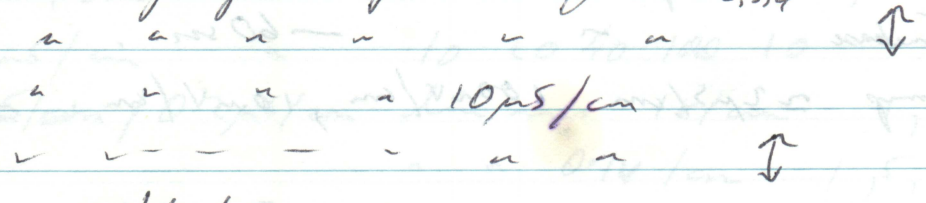
7491 — ht lead of deflector repaired – now quieter & as expected

6 KV/30μA detector 2021KV, lens 1.00 KV, sweep dc+280v, pulse 710v
1st=1000 short delay, then Ga^+ gated out, Ga_2^+ etc in.

ph camera blank

2μs/cm 80μA 6·87

series of digital of showing $Ga_{2,3,4}$



10μs/cm

blank

same conds, analogue amp 2μs/cm

10μs/cm.

Thurs 25 Oct

Harry's martinis

T494 — Few pulls on end of Ga pile — popped ⇒ from 5 to 10

T494 ~9.2 + 1.8 — 230/560 — ^{210}Ne/60

a ~2400 — near b, ? boundary or not?

b ~3K — from ? boundary

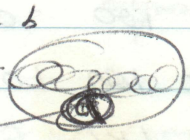
ph × 1 where b

ph Mafph

ph × 3 where b

IAP × 5

IAP × 2



Fe^{2+} 57 = 470 nS

S_i^{2+} 332 nS = 41

C^+ 307 = 37

C^{++} 218 = 26

S

Fe^{2+} 1 mm

S_i^{2+} 1 m

— flashed

IAP flash

ph flash

Tues – putting in extra apertures after x-y plates & light baffle to try to reduce noise level.

Wed 6·6 KV / 50μA collector
lens 100v, Dendix 2?5v / deflector 450v amp 708 ?V.

Ph blank
2μS/cm, dly amp 10 20 30 40 60? 100 20 secs f1·8
5μS/cm " 10 20 40 100 20 f1·8 "
20μS/cm " 10 20 40 100 10
2μS/cm / 0·2μS/cm lin amp 1V/cm 1, 5 sec f4
" " 0·1V/cm 1, 5, 10?

Photo 2
[493 ~1500 short delay time, long time delay → spectrum position (suddenly lots of ATMs). Investigate.
2 μS/cm lin amp 50μA 7·0?
10 " "
20 " " now quiet after ~30μS
2 " " dly " " "
10 " "
20 " "
10μS/cm [illegible] 10, 20, 10, 20
blank
→ ~150μA i total (>110μA i coll)
lin amp × some 1V/cm / ·5V/cm / ·05/cm
dly amp × some 2 10 20μS
↳ 10μS/cm integrated

Thurs 25 Oct

Harry's martinis

T494 Few pulls on end of Sn pin — popped ⇒ from 5 to 0

T494 ~9.2 + 1.8 230/560 210^{-2}Ne/60

a ~2400 near b, ? boundary or not?

b ~3K from ? boundary

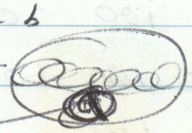
ph × 1 where b

ph Mg ph

ph × 3 where b

IAP × 5

IAP × 2



Fe^{2+} 57 = 470 nS

S_i^{2+} 332 nS = 41

C^+ 307 = 37

C^{++} 218 = 26

S ——

Fe^{2+} 1 mm

S_2^{2+} 1 m

— flashed

IAP Blank

ph Blank

Cra μ x

li ang 80 μA

~410⁻⁷ - a x 10

dog ang

→ shift angle of spectrometer to RHS

blank

dog ang x 2μS/cm

x 10μS/cm

– quiet

Fri 26 Stefano SS / 750mm² 485°C

17.5 KV / 78 / We 2 lights ph x4 – gb und ph

T 496 480/560 / vac / 78 16.85 + 2.7 all on gb
16.80 ~ 7K

T 497 " " " " 16.80 + 2.7 not gb

– check @ ~7K und (gun in)
– still not on bdmd

1

more.
ph blank
ph x4
IAP x 3

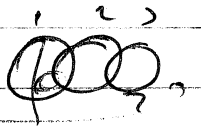
Fe 44 = 260
Ni 45 266
Cr 42-II 247
Al 31 250
Cu 30 236
Co 21 167

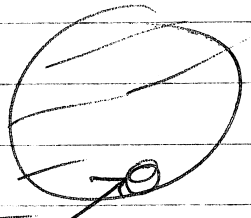
Fe 60
Cr "
Al "
Fe "
Ni ? "
Cr "
Al
Cu – more

IAPN. upch 2
IAP x 3
IPP x 3

17.3 KV +2.7

Fe 60?
Al
Al
Cr
Cr
Cr
Fe
? Ni
? Ni
IAP ×?
MP
Fe
Al
? Si
Al
? Cr
Cr
Fe
? Cr
Al
Al
IAP ×?
pl × 4 or 20





? ppt - at edge of Cpp

~ 498 on ppt

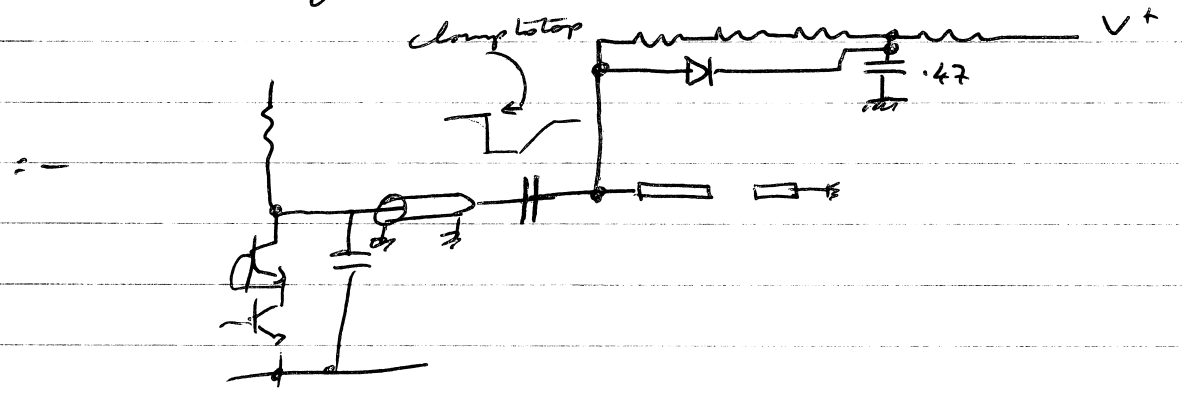
445/560 18.5 + 2.7 / Na 175

~600 Ca - still on ppt.

grading towards Cpp

31 Oct

Add clamping diode to deflector on mass spec



Try putting +15V bias on collector to try to suppress 2° electrons – only slight improvement in S/N if any: suggested by Phil Rocett – thinking about it, if Ga source emitting Ga vapour, e-bombardment will give Ga^+ with random energies ⇒ noise, likely when source has been running long enough to be hot.

31 Oct

499 17·6 + 2·7 / vac / 78 440/560

– check @ 1000 18.05 + 2·7 – still aligned OK

b new system @ 1600 440/560 18·1 + 2·7 / vac

18·56

ph × 3

ph × 1

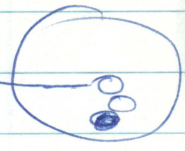
ph MPA

ph × 3

500 a 18·55 + 2·7 / vac / 78 440/560 from ? ppt just above carbide

18.55

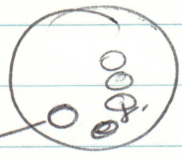
b 18·65 " " " matrix ? just above γ'



ph camera – title in – several blanks

ph × 3 where 500

move 4t, ph × 3



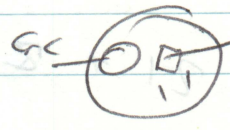
move again away from ppts

501 – electronics stopping (? dunno why) – worked eventually.

450/560 / vac 18·75 + 2·7 1200 / motion

IAP blank

IAP × 5



Fe^{2+} 42 = 340

Al 27 = 236

C^{n} 26 223

Cr^{2} 41 328

N_2^{2} 42½ 346

C^{6} 20 157

Fe^{2+} 60

IAP multi 3

Al

Al

CC

C

Al

blank

Jue 15

2C
Al
C
Al
C
Al
Fe^{2+}
Cr^{2+}
Cr^{2+}
Cr^{2+}?
Ni^{2+}
Ni^{2+}

20.3 + 2.7.

↑

IAP x3 = 4 18.6 KV

Fe^{2+} ~60s
Cr^{2+} |
Al^{2} |
C^{2} |
Al |
C^{2} |
Fe |
Ni |
Cr |

21 + 8.7

IAP 4W
IAP

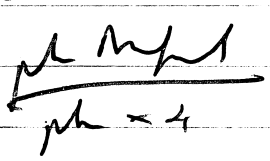
Fe^{2+}
IAP Mg 4

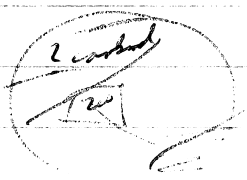
Al
M
C
C
Fe
Cr
2Cr
Fe

Σ

Ni
Ni
(Cr
Cr)
? Fe 30,
Al >2:
C
~~Hardy~~ IAP x2
Mn x2
Mn x2, x2
IAP x2
~ Fe 2+
Al
Al
(-ethyl C)
Cr x2
Fe
Ni
IAP x2 - overexposed.
Mn x2
Mn x2 where 502
7502 a ppt
2K
500/560 rec
20.8 + 2.7
~21
b ~~H~~ ppt 2K — 20.98 -
Mn x4 where b
Mn x1 useful
~~Mn~~ Mn

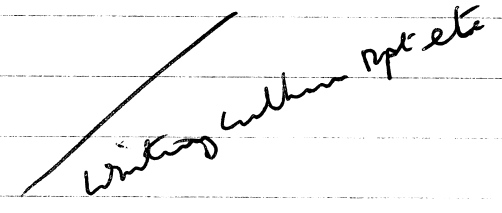
Fri New 55/750
~8KV





~~503~~ a 210/560 /var /60 8.53 + 1.1 — 1.6
~ 1.5K still on carbide.
move to brite200 @ left of tip (no pins as broke camera stand)
b 210/560 8.5 + 1.6
~ 1200 cps.

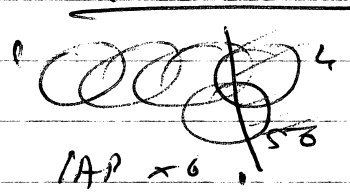
Move to antic, matrix
504 a 220/560 var 60 8.7 + 1.73 - 8.8 + 1.85 1700
b dark line just below centre - ? Edge
8.8+1.65 — 8.8+2 ~2K.
good luck tomorrow.

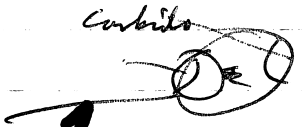


Fri 9 Nov 79 Some 55 spec ph × 2 9.65 Ne/60

1 AP × 2 LHS

1 AP Multiple





1

Fe 480 = 60

Cr ~~235~~ 462 = 56

Ni 488 = 61

C 314 37½

Al 333 41½

Si 240 42

C₆ 222 26

Fe 60,

Cr

C₆

Al

Cr

AC

2 c

Fe

Cr

Ni

1AP × 3

down 1AP × 3

9-6 + 1-6 ~~mc~~

9-5 ~~per~~ ~~dw~~

Fe

Cr

AC

Cr

C₆

Fe 60,

Cr

Ni 1

C_6 1

C_{12} 1

Al – aerial quiet. –10.4

IAP ×3 – new carbide

ph ×2 carbide

DC empty

ph × 2

IAP of carbide

IAP Ni-Al 2

IAP × many

etc

ph × 2

IAP × 2 or 1

– typical grain

ph × 3 or 4

IAP

Fe^{2+} – prop.

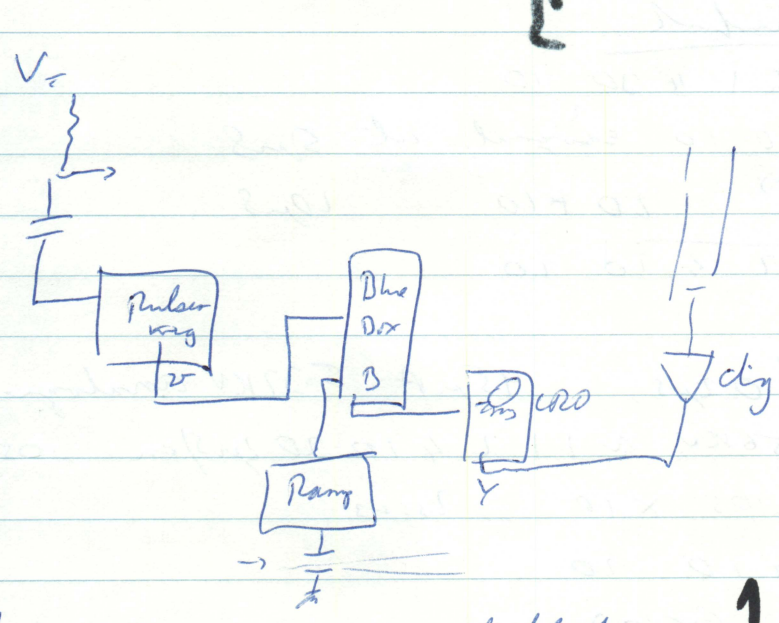
– fluorite.

~ 11.5 kV

Tues 13/Nov/79

Cu source $1\,10^{-7}$

with 70 μs pulser to try to get heavy droplets



60 μA

6.07 + 1KV

+2

+3

5.15 +3

pb blank 1

1 ½ ¼ - - - 10 20

2 μS/cm

? closed off with, → needed lower V_t for 60 μA DC

50 → 5.15

blank

5.15 + 4 1 , 20

pb blank 2

~ 5.54 1 2 4 10 20 20

100 μA 2 μS/cm

← diamond pulses

~ 5 μS/cm, similar noise to measure ↓ collector

pb blank

5.54 KV, 107 μA

~ 1 2 4 10 30 5 μS/cm

6.13, 150 1 — 20 ~

6.8 200 ~ ~

7.4 250 ~ ~

~~7.250~~

7.76 240 1 — 20 2 μS/cm.

8.5KV 13 μA 1–20 sec 2 μs/cm
~ ~ 5 μs

? Camera stopped working down ↑

μh Output 3

5.08 67 μA ± 1 4 30 10
10.06 430 10 10 ? signal at 5 μs
7.65 264 10 ×10 20 μs
1 2 4 10 20

1 J 4 secs 2 μs/0.2 μs 95 μA 5.32KV analogue amp
204 μA 6.56KV ± 1 1 2 4 10 20 2 μs/cm .05
.05 ×10 2 secs

412 μA 1 2 4 10 20
9.85KV 1, 2 1 (×10)

10 μA, 4.73KV 2 μs/cm lin, ×10
– still some Cu_2^+
– dly 5 μs/cm ~ 1 5 10 10
2 μs 1, 4 – ? and Cu_2^+

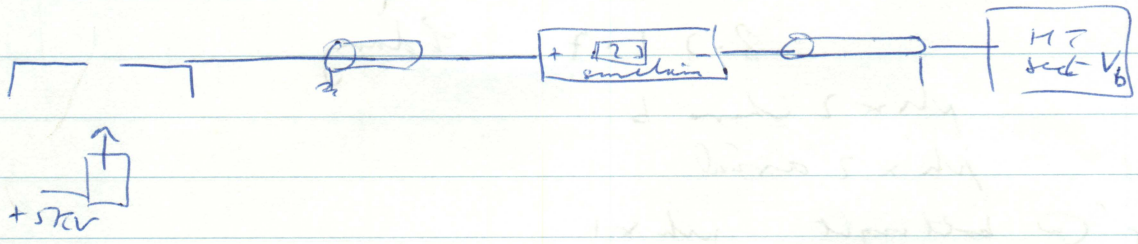
μh Output

KV	ic – from inline meter	– limiting resistor 5 MΩ	
4.73	.014 mA	6.4 190	6.6 .212
4.81	.025	6.6 .208	5.4 .105
5.00	.052	7.02 .238	5.10 .067
5.1	.084	7.36 .261	4.76 .020
5.2	.077	7.65 .279	4.68 .009
5.3	.089	7.47 .300	(4.68 .005 meter stuck)
5.4	.100	8.51 .327	
.5	.111	9.00 .361	
.6	.121	9.52 .385	
.7	.132	9.67 .403	
6.00	.159	9.80 .418	

• 415 mA in 5mΩ $V = IR \approx 4 10^{-4} \times 5 10^{6} \triangleq 20\,10^{2} = 2\text{kV}$.

so range $\triangleq$ 4-7 kV ~ 7·80 kV for $i = 14\,\mu\text{A} - 415\,\mu\text{A}$.

Effect of collector voltage on collector current



V_b	$i_{\mu A}$
0	39
+1kV	39
+2·2	39
(−900	45
−1900	45)
−400	66
−2kV	78
−2·5	81
−1·5	78
−·5	71
−·4	67
−·3	67
−0	57

purged.

replace similar

with 50 μA ave.

−24 μA @ 0v.

up to +2kV no change

but −0v to −2kV = 28 μA

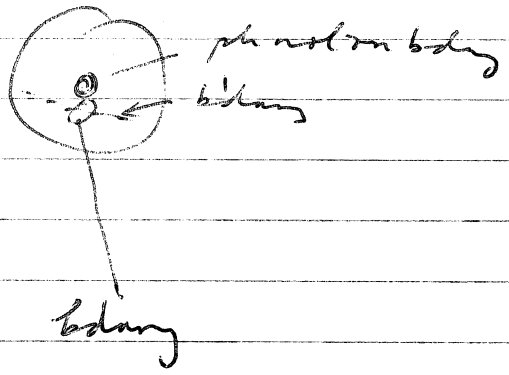
odd.

p $4 10^{-8}$ Torr at end.

Thurs SS 75 mins $< 1 \times 10^{-9}$ / 60 / No

ph × 2 8.6 KV

ph × 3



505 210/580 vac 8.0 + 1.5 − 1.6

a 2K2

b 8.0 1.7 bdamp

ph × 2 show b

ph × 2 aerial

2 g' @ bolt right ph × 1

align on ph × 2

506 8.45 + 1.7 vac 210/580

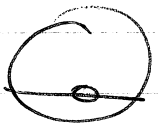
Fri — Mon report-writing for Phil Brewett, visited monday + Am source (broken!)

Wed 21/Nov/79 Some 55/75 /70↓

μ check

μ × 3

μ × 2 on bearing at bolts



507 230/560/rac/70↓ 9.13 + 1.5

check @ ~ 9κ

— 9.15 + 1.8 ~ 12 κ

μ × 3 where ↗

μ × 3 around

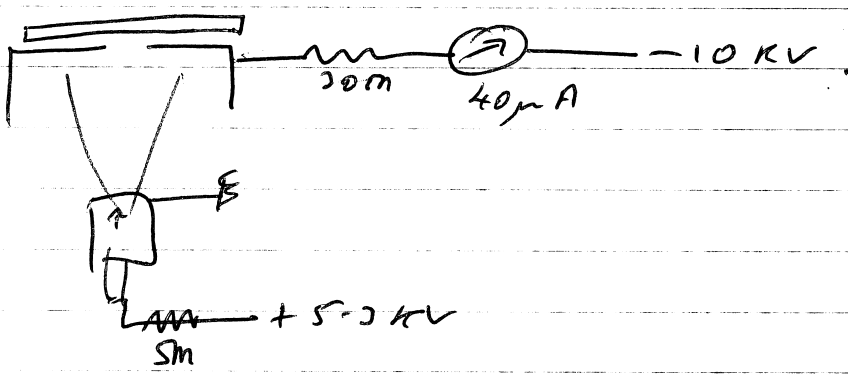
going home time.

9.35

16

Thurs 22

Ion implanting Ga into Ag for M. Irving.

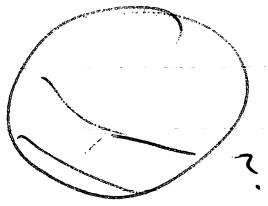


2 Mins exposure @ 40 μA total current
(difficult to stabilise, kept going off, &
restarting with a v. high current (~ 4 or 5 times).

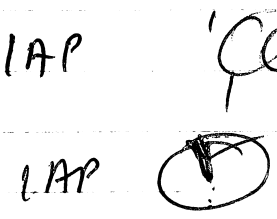
Same
Tri 23 55/75/60/Ne.

μh x 3 . 9.92 KV

1



IAP



Edmund.

IAP x 2

~~Fe~~ $^{2+}$	60.5 = 480.5	60.5
Al^{2+}	~~2354~~ 324	41.5
C^{2}	467	56.7
$N_{i\,29}$	489	61
C_{12}	315	37.5
C_6	222	26.2
S_c^{2}	340	42

N_i 90m

[dual]

C^{2+} 90s

IAP Mixed 2

Fe

C_6

Al

C_r

C_m

C_{12}

Al

Al

Fe

N_i (+some Fe) ← ? dual.

IAP x2

IAP x2 around

Fe

Al

Al ↑ var

Cr ~10 + 1.88

MP ⇒

pl ⇒

electronics unstable (hot!) for pulsing

⟶ Working bits for coating Li-Au tips.

Fri 7 Dec

55/75 as before

ph x 2

ph Mapleton

ph on dark area just to left of centralpole

508 10.0 + 1.8 260/560 vac rapid,

~20x – At risk at end

– electronics stopping at end – not recording times.

– 10.47 + 2 at end | – slip

slant pulse cable dodgy – ignored operations

Fri 14 Dec 55/75 same spec

10+2+1.8 vac/60 same plume, ±1K or more ions in between unresolved)
—10.52+2.0 260/560 ~13K
↗ – leak in diff pump fixed before slant

509

Results as fn of V probe

570 a 250/560 vac 10.6 +2.0 ~1K
b 280/560 – 10.6 – ~1K
–10.7 +2

~~Mn Mn/it~~
Mn ×) check 508 – 510
Mn ×) – asind 10.8 KV
→ bright area on RHS
Mn ×)

511 10.9 + 1.8 280/560 vac
~700 ions – flashed.

Mon 17th Dec.

Rh / Ne / 78↓ / $1 \cdot 10^{-9}$

μ-3 5.35 KV

— Trouble focussing — ? mirror loose again

expt 60 ~ 7KV

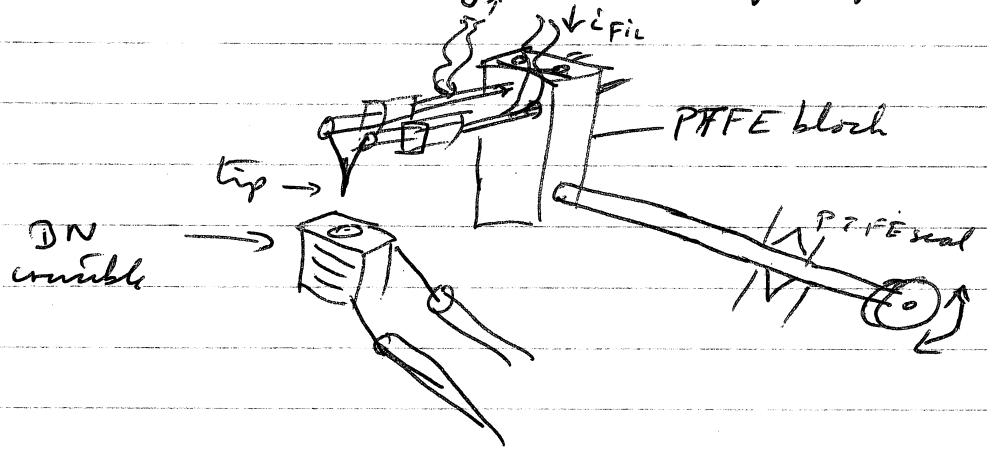
517 6.64+1 / 160 / 500 $1 \cdot 10^{-6}$ Ne / 60K — grainy!
— keep trimming

513 run 60 / 170 / 560 6.81 + 1.38 } 3300
— 6.96 + 1.43

— tried to get spectrum in He — flashed

Xmas

— finished assembling device to dip tips into liquid metal: —



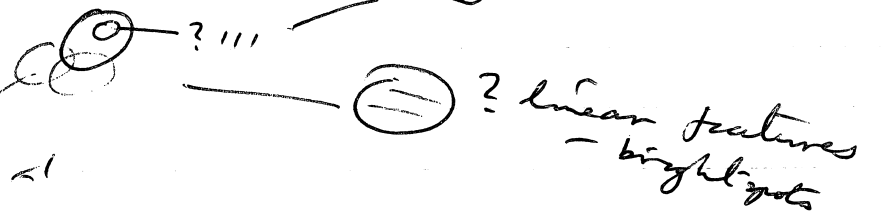
— seems to work ok with Sn.

7/1/80

APKI asymm $60/110^{-9}/N_e$
– to check structure of asymm spectra.

<u>ph blank</u>

ph × 4 11·6KV
ph × 3 10·6KV
nS pulse ~ 11 + 1·7
IAP × 3
IAP × 2or3
back 6211 IAP <1



Ni^{2+}	56	~~780~~	460
Al^{2}	27	~~477~~	310
Cr^{2}	54	662	435
Ti^{2}	52	636	418
Mo^{2}	72	882	580

^{2} 204 = 24
$^{+}$ 287 = 25

Ni^{+} · 75 sms
Cr ^
Ti |
Al
Mo |
Ni^{+} |
Cr |
Ti |
Al |
Mo
Cr /
Ti /

IAP Mg/Al 2 ↑ where
IAP × 7 1
IAP × 3 2

Ni 60 .
Cr c
Ti (
Al
Mo
Ni
Cr
Ti
Al
Mo

13.2 + 2 vac

IAP (Div × 3 12 KV — 2 dark lines
IAP × 2 12.5KV]
ph × 3 3 iv
ph × 3 < 3 iv
IAP × 3] RHS
IAP × 1

M
Cr
Ti
Al
Mo
Ni 40 sec heat
— diff Cr/Ni
Cr
Ti — pop
IAP × 1 — 5M
Ti
Al
Mo
Ni
Cr
2 Ti
Ti
IAP

13.7 +2-3
14.9 + 2 →

5

MAP × 6 or 7

pA × 6

(~4.5 KV LW)

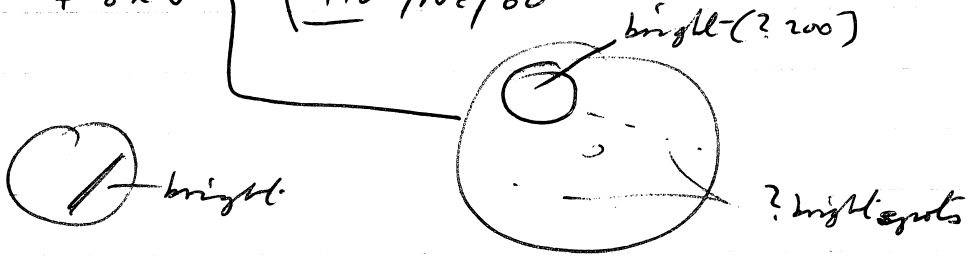
11/1/80 Harry's Martinsdale [Fe/Si/C/Mn]

1

pk × 2 7·8 KV $1\overline{10}^{9}$/Ne/60

IAP blank

IAP × 2

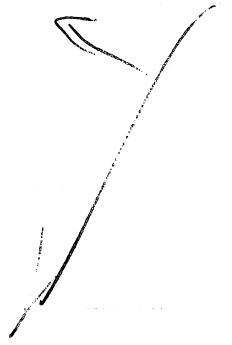


Fe^{2+} 66 = 540
C^{2+} 31 = 250
C^{+} 43 = 350

Si^{2+} 380 46

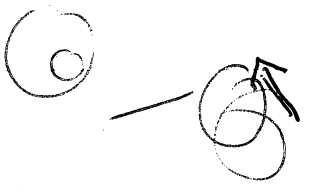
Fe^{2+} × 40sec
$C^{?}$
$C^{?}$
$C^{?}$
$Fe^{?}$
C^{1}
Si^{1}
$C^{?}$

a little Ne present.



~ 8·1 + 1·2

IAP × 2
IAP × 2
Fe 60sec
C^{1}
C^{2} ← ? Fe
Si
Si
C^{1}
C^{1}
C^{2}
Fe^{2}
IAP × 2
IAP × 1
Fe^{2} 60s
C^{2}
C^{2}
Si



8·5 + 1·25

IAP N mixture 2

M/S 2

Sc
C^+
C^+
C^{2+}
C^{2+}
Fe^{2+}
IAP × 2
ph × 2

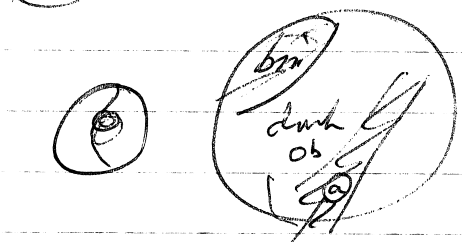
IAP × 2 down about
Fe^{2+} 60s
C
C^{2-}
Sc
Sc
C^+
C^+
Fe^{2+} ← pattern the blush so not possible
IAP × 2 10.36 KV + 1.5)
ph on bright region

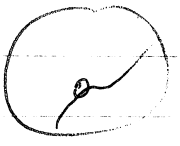
T 574 a 10 K 250/60 some gas present 9.90 + 1.55
b move to dark area
1K 5
ph × 2 where b

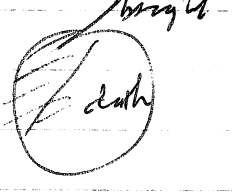
- interface ph × 1

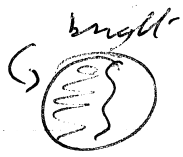
T 575 ph Methods
10.24 + 1.65 all at 1 volt
dark at 5K 5 10 K
ph × 2 where 575

IAP ≈ 6 1 5 10 15









top IAP × 2

delay line in

7e 60 s

C 1

C

Sc

SE

C

C

IAP Mnpl 3

7e

C

C

IAP × 2

IAP × 1

IAP × 2 down

7e

C

E

Sc

Sc

— pulse doubling turned off

IAP × 2

ph × 3

11·25 + 2·18 (+delay)

11·87 KV

T 516 a dark area, near light area 280/560 11·1 + 2 (Ne, mesnt)
2·5K

b further away from light area (first 50 with correction)
2K5
ph × 3 where b
ph × 3 on bright area 12KV

T 517 2K5 280/560 11·3 + 2·25

151 to Listings

£

1/ Neptune Krypton Ein 1AP pulser – old one unstable – pulsing on
attenuate trigger below 3.9 kV . ? .

17/1/80 Scene martensite 60/No

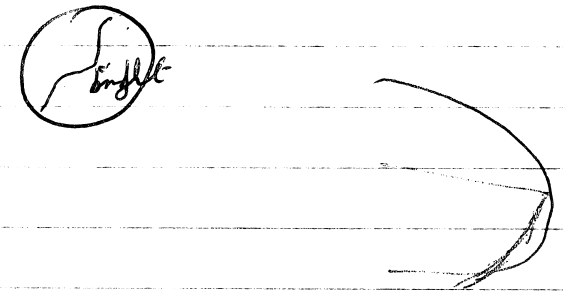
ph blanch

ph < 3

Nh < 3

marginal IAP × 3

punctate IAP × 1



Fe^{2+}	52	420nS
C_6	23	194
C_{12}	33	275
S_{i14}	35	296
C_{24}	46	388
C_{36}	60	476

Fe^{2+} 60 sec

C^2 5

C^2 4

Si^2 3

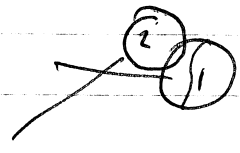
Si^2 2

C^2 1

C^2 -

IAP × 3

IAP × 2



Fe 60s

C^2 1

C^2 |

Si |

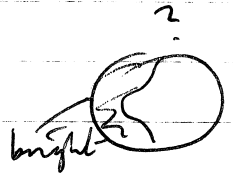
Si |

Fe |

IAP × 2

more right IAP × 2

Fe^{2+} 60s



IAP manifolds

C_2^2

C_2^2

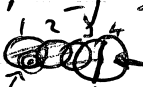
C^1

IAP × 2

Lunch

μ × 2 11.5 KV after standing overhead

μ × 2 12.5 KV emptying standing.

IAP – bolton  dim.

Fe^{2+} 60 sec pale blazing

– diff pump overheating? – stop to investigate – shut-down other loads on cooling system.

IAP × 1

C^2

C^2

S_i

S_i

C^1

C^1

C^2 60 sec

C^2 120 sec

Fe^{2+} 60 sec

C_3^+ v little

C_2^+ "

C_2^+ "

IAP × 2

IAP × a few

IAP × 2

Fe

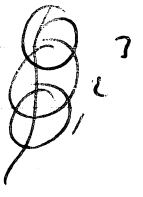
C^2

C^2

S_i^2

S_i^2

C_3^{2+}



13-7+2·2

C_3^{2+}

C^{2+}

IAP Analysis 5

Fe^{2+}

IAP ×3

ph ×3

pM ×3

ph ×1

IAP ×2 — top

Fe

C^2

C^2

S_i^2

S_i^2

C^1

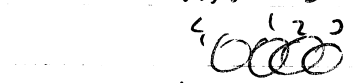
C^1

Fe

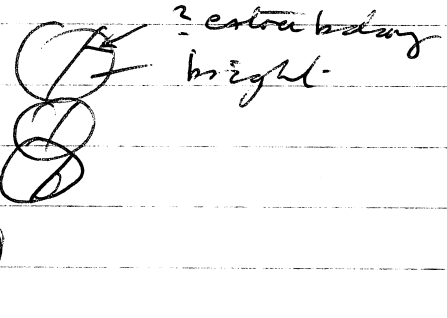
C^2

C^2 — less gas ~ none

IAP ×3



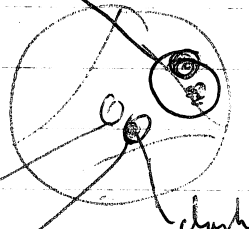
ph ×3



(some gas)
(& also pMs above)

14·14 + 2-33 KV

IAP ×4



pM ×2

T578 a 14+2-33 340/560 (some N & present)
(pulse slightly too low) from mainstate
~ 5%

b pulse to 2·60 + 13·8 — 13·45 less gas.
~ 5% from darker area
ph+1 where 1

ph x 1 ~ austenite

T519 a 14·0 + 2·68 rad 3401560

just inside austenite (dark region / rad axis)

b — same conditions, but using Kim 14 programme as check

— ? noisy detector thro'

14·1, 14·2 → 14·28, ~ 1 K eV

look at detector o/p — bit noisy, + some afterpulses ~ ·4 — ·6 μs after pulse.

— limited discrimination ~ 1 full turn austenite

— little apparent change in delta efficiency (scope)

+ ~~fig~~ ~ none afterpulse, ~/ noise / tensions.

— ? coils/plane = now?

— DC cryst specimen → austenite visible

ph x 1

ph x 2

— ph Nufilm

— spec ~ bright martensitic plate with dark austenite each side

ph x 4 15·2 K eV

going home time

on 19th looked at linear amp o/p from Cathom spectrometer → noisy, with 50Hz + thyristor spikes — ? earth/neutral connection somewhere again.

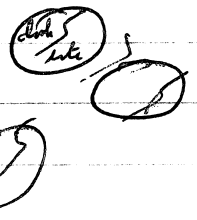
18th – clean out cooling pipes on diffusers with del trolls – better, but mag valve still leaking oil

21st some Montmorte — ph blank — 60 / 570 ~~"~~ / We

ph × 3

ph × 2

ph × 1 or 2



15 @ 3 KV

TS20 – to test effect of ~~optimising~~ resulting amplifier threshold – K17/18 programme as per usual.

a – off montmorte 13.9 + 2.6 / 2K 340/580 / some Ne

b move to step, montmorte ~~5~~ " " " " "

– well towards top / off axis . 2K2

ph × 3 where b

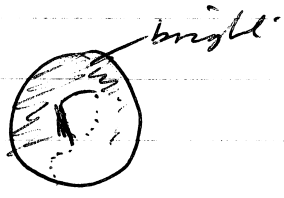
ph × 1 down a bit

ph × 1 ~ axial

1AP × 3

1AP × 3 or 2 or 5

1AP × 2



Fe

Ca

C

S7

S1

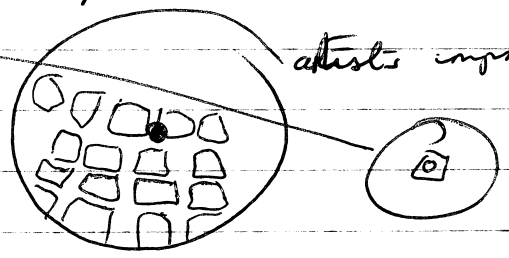
Fe

C rapido

C ~ – ph shorted.

21/1/80

Sabs Ni/Al/Cr $14\frac{1}{2}$ $16\frac{1}{2}$ at% as quenched from 1250°C.
Ne/60/$1\cdot10^{-9}$

ph x 3 8·2 KV axial — ppts rather.
ph x 3 rdg. axial
ph x 3 —  artists impression! [STEM]

~~SS~~ T521 a 205/560 on bright ppt + some Ne.
8·13+1·5-1·6 — after checking @ 1K, ~~was~~ on interface
8·13+1·7- so more back to bright ppt for b.
checked at 500 - OK
~2K ions ∴ eli - eli, all OK.

T522 205/580/1Ne 8·13+1·85-1·9 from dark area between ppts.
~2K from dark area. - bit faster.
ph x 3 sharper 522
ph x 1 shifted a little

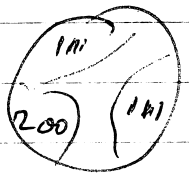
60 Al
760 W
1080

IAP x 3 ε

60 Ni^{2+} 510 nS
60 Cr^{2} 483
43 Al^{2} 3 48

Ni^{2+} 60, A

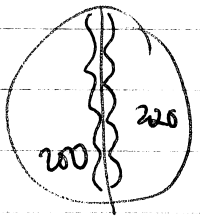
IAP Multiplex 2
Cr 60,
Al "
Ni "
Cr "
Al (grey) ~9 + 1·8
IAP x 2 10·7 KV
ph x 3 10·79 KV — pretty



28/1/15

IAP Small crops of 200 IAP × 60 or so (2 ± plane purple)
— not visibly ordered
nS pulse => more regular
IAP × 2
Ni 2
Cr 2
Al 2
Ni 2 — 5 planes counted. (~1200 pulses)
Cr 2
Al 2
IAP × 3
pH × 3 biV
pA × 2 < biV

? mod



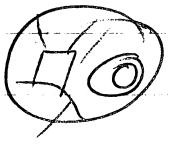
IAP ×4,5 small crop sequence. 220 (we think) central.

IAP new film 3

IAP dots — apparent AP D on 220

nS pulse IAP × 2 or 3
IAP Multiple 4
IAP × 2 or 3 5
Ni 60, 5
Cr 5
Al .
Ni 60, positive
Cr .
Al . 11.5 T2 (some Ne)
IAP × 2 most (no delay line)

Move to 1st bolt on right-



1AP x 3

~~AA~~ Ni 60, ~6 planes

Cr

Al

Ni

Cu

Al

+2.1 pulse.

1AP x 3

200 bolts left- 1AP x 3 — ordered

1AP x 3 < 11.62 KV.

pA Mylar 2

pA x 3 Div

pA x 2 to convertor gain down

-2.3+

~~5223~~ 280/560 11.52 + 2.1 /Ne.

- start on bright region.

~ 14K

pA x 3 where 523

- on bright region.

~~dark~~

Tues 22 Same MiCrAl 160°/60

ph blank

ph ~

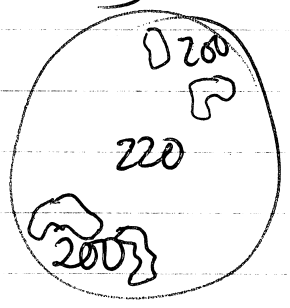
T524 300/560 12-7+2 var

— showed right-down at ~ 4.0K

— stop — proved

ph ~ 5 definitely connected

pretty!



~~825~~ 14+2-12 340/560

— flashed.

— flashed.

L2/1

New Spec PE16 Alloy 5 as quenched or SHH. (III)

T 525 $6.76^{+1}_{6.9}$ /170/560 ($Ne\ 2\cdot10^{-4}$) 60 / $1\cdot10^{-9}$

20K — reduce by ~500 at 11.4 K ions as vent-mod
— and bench again after ~50 ions

175/560 $7^{+1.3}_{7.3}$ — 7.1 ± 1.44

— alleged composition: —

wt%	Cr	Ni	Mo	Fe	Al	Si	Ti	Mn	Co	Zr
	17.6	35.3	4.85	39.2	1.11	.002	1.12	.01	.03	.01
Norris	25–27	29–32	46–50	27–29	13.5	14–15	23–25	27.5	28.5	45–48
		58–64			9		15.3–16.6	30.6–33.8		30–32?
m 525 this one	17.42 ± .52	34.02 ± .72	4.43 ± .33	41.3 ± .77	1.41 ± .09	.0029 ± .015	1.72 ± .15	( )	( )	( )

Bremptol:— 1 Al 13.3 – 13.9

2 Ti 15.2 – 16.8 — some overlaps: Ti/Cr

22.8 – 24.8 Cr/Fe

3 Ni 28.8 – 32.2 Mo⁵⁺/Cr³⁺

57.5 – 64.5 Ni^{2+}/Mo^{3+}

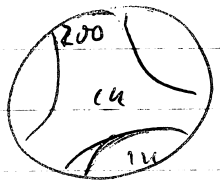
4 Cr 24.8 – 26.8

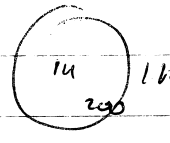
5 Fe 26.8 – 28.8

6 Mo or 43~~45~~ – ~~50~~ 50.5

$\frac{\text{ph blank}}{\text{ph} \times 4} \sim 7.5$ kV

$\frac{\text{IAP blank}}{\text{IAP} \times 2}$ 14 axial





27/Fe 68 = 550

26 Cr 65 530

29 Ni 70 560

13.5 Al 46 382

47 Mo 107 713

24 Ti 63 510

Fe 60₃

Cr 1

Ti ~

Al
Mo
Ni
Fe
Cr
Tc
Al

IAP Nuffield 2

Al
Mo
Nb
~~Fe~~ Cr
~~Cr~~ Fe
IAP x 2.

To 2000 IAP x Cols — 3 ordered.
Fe 60s 5=10 planes, probably.
Cr (
Tc (
Al
Mo
Nb
Fe
Cr
Tc
Al
Mo
Nb
Fe
Cr

IAP x 2or 3
Mn x 3
yearly human time. [20·15]

23/1 Same PE16 as q

ph blank

IAP Mn/Fe 3

ph x 2 axial 8.6kV.

7526 111 white 210/560 8.5⁻ + 1.5⁻1 —

↓↓

8.4 + 1.61 after ~ 1500 ions

8.4+1.4 after 1600 ions continued.

so 8.2 + 1.6 ~

5102 meter turned down 100V to 8.28

Observation: @ 5770 rate 35±5 / 10s

5920 " 20 ±5 / 10s

6040 went mad 8.23kV

6079 still furious (8.13kV 6100 restart)

at 14K pulse to 1.6 (+ 8.4) Pulse to 213 - further transients other things

end at 213/520 1.62 + 8.5.

ph x 2.

IAP 200 x 8 or 9 small crops - probably ordered

IAP 111 x 2

Fe 60,

Cr "

Ti

Al

Mo

Ni

Fe 20 plasma

Cr

Ti

Al

Mo

Ni

Fe

?

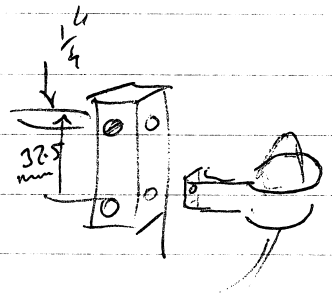
"

Cr 60s
Tc
Al
Mo
Ni
IAP x 2
200 IAP x 1 or 2
Fe 40s
Cr
Tc
Al
Mo
Ni
Fe
IAP x 1 or 2
Cr
Tc
Al
Mo
Ni
IAP x 2 (moved first)
Ph x 2

Σ

4

extract.



Cathode Cold source inserted into TOF spectrometer

25/11/80 P. Southwicks mystery alloy.

ph × 1

~~ph Nfpth~~ 2

ph × 2

ph × 2 after respiking 10.6 KV DW – spoilt

T 528 axial 10.27 + 1.9 /Ne/ 250/580 ~ 2K5

ph × 2

IAP × 2 ~ axial

7e 45 sec

Cr

Ni

Mo

Mb

Si

Si

C

7e

Cr

Ni

Mo

Mo

Mo

Si — looked for C² & C¹ — more to speak of.

Si

7e

Cr

Ni (1 thumb)

IAP × 2

ph × 2

T 529 11.4 + 2-1 300/580 } ~ 15K

– 11.4 + 2.28 axial/Ne

ph × 2 where 529

Cathum Gold source outgassed 2A -> $1 \cdot 10^{-5}$ T after 1½ hrs.
(starting at ~ $1 \cdot 10^{-6}$)

1041
2815 223
10
205

18,7

440 529
220 250
1241

Sat 26/1/80 Sumerian Ne/60

? gb below centre

T 500 11·6 + 2·3 / Ne 285/560 2K

T 501 11·6 + 2·3 / Ne ~ ~ rejoins

~ same, plane ~ 5K

ph × 2 ?

ph × 2 ? carbide dr. edge, left 10·95 KV

— coated gr. 6 ~ 15KV — no obvious ppts except (not probable)

— flushed

8/5000 1·6

Newspun 110°/60/No

Ni/Al/Cr/5min 670°C

ph blank

ph × 2 6·83 KV

ph × 2 6·24 KV ph on 200 environs. — ordered

T 532a 160/560/Ne 6·22 + 1·1 − 1·3 from bright ordered region.

dust area 6·22 + 1·3 − 1·6

except 6 8·08 ph × 2

ph × 2 < 2W

ε

500 7 + 1·65/Ne 180/560

ph × 2 ≈ above 7·76 KV

IAP × 2 200

Ni

Cr

Al

Ni ~ 12 layers

IAP Multiple 2

2

N_c

C_r

A_l

IAP x 3 — ? AP 0

Move down IAP x 3

N_c

C_r

A_l

N_c

C_r

A_l

IAP x 3.

N_c pop

N_c pop

IAP x 2

N_c

C_r

A_l

N_c

C_r

A_l

IAP x 3

IAP x 3

IAP multiple 3

IAP x several

ph x 3 or pretty

going home time.

29/1/80

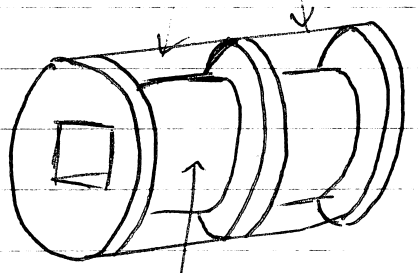
Was 15+15 : 15+15

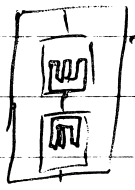
=> 23+23 : 15+15 & 8+8

- winding transformer for running the coil source

Primary 23+23 Sec 15+15 + feedback 10+10

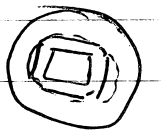
- former carved out of 2" Nylon bar with a file (phew!)





ferrite core
- 177's
largest.
Fx...

faces cut with lathe, then flattened



Keith Page producing drive circuit.

20 swg enamel wire for 1°, 2° 28 for f-b winding.

1.5
1mm

29/1/80 Subs NMR Cr/5mm again $110^{-9}/60$

T534 220/560 9.05 + 1.5 − 1.8 from bright centred 100

. at ~~1~~ 225/560 9.05 + 1.8 − 1.94

total ~20K ph x 3 where 534.

30/1/80 Some MAC $6/10^{-9}/60$

Mn Multiple

Mn ↔ 9.8 KV

IAP block

IAP × 5

Nc 60, -length, imp

Cn : no gms

AC :

Nc imp

IAP

Nc

Cn

AC Some gms.

Nc

Cn

AC

IAP × 3 11·2 + 2

IAP × 3 RHS

Nc 60s

Cn 2

AC .

Nc 45

Cn c

AC c

Cn c

noise level a — lip still emptying, long delay.

IAP × 3

IAP Multiple 4

IAP × 4 LHS

Nc 45

Cn

AC

Nc

Cr – prep 45,
Cr
Al
Cr
VAP ⇒ .

T505 270/560 Ne from bright area initially
10.69 + 2.2 ⇒
mean reduced to $5 10^{-10}$ from 10^{-6} ↑ at ~ 22K min
pulse to 2.4 – 2.5
26K total .
ph ⇒ where ↑
ph ⇒ axial 10.85 KV

T506 — aligned carefully on 200 to get min/plane count
10.81 + 2.6 270/560 ~ max

31/1/80 Soudure échantillon 1-2 10^{-7}/60/Ne

ph blanc

IAP blanc.

Fe 40

Cr "

Cr "

Cr ↑ 200 Hz

Fe ↓ 100 Hz 40

Cr "

Cr "

Cr 60

IAP blanc

Si 51 | Fe ? 40s

Fe 72 | Si "

Cr 70 | Si "

Mo 142 | Si "

C 32 | Ni "

Mo vitesse

Mo 1 min

Mo "

Fe "

C 1 min "

C " "

C " "

Cr 40s

Cr 1 min ↑

IAP x 1 7 + 1

IAP échantillon 2

↳ ph x 2

IAP x 2

IAP x 1 ∧ après ↓ puis 1-2

Fe "

Cr "

Cr

Cr

Sr

Sc

Sc

Fe

Ni

Ni

Mo 60s ↑ martin 60s, var

Mo 4

Mn

Cr 40s (partial)

LAP x 1

more down LAP x 2

Fe 45s

Cr

Cr

Sr

Si

LAP x 2

left LAP x 2

Fe

Cr

Cr

Cr

Sr

Sr

Si

LAP left

LAP right

31/1/80 1

Ar Source 4·57 KV i_c 21 μA i_{H_2} ~30 μA

① ph camera 5 μS/cm ~ 1 ½ ¼ 2 5 10 sec f1·8

" " " " " f1·8

both ·05 V/cm, ×10 probe = ·5 V/cm

More with amp & brass set so no −ve overshoot

5 μS/cm f1·8 —— ~6 ·5 V/cm

" " " —— ~6 ·05 V/cm (×10 probe on)

Deg amp 5 μS/cm 10 sec f1·8

ph Nafion 2

Deg amp set ||| 5 μS/cm

set |||| " "

— various thresholds for amps. Ar^{++} Ar^{+} Ar_2^{+} Ar_3^{+} Ar_3^{++}

— lin amp ⟩ Ar^{+} peak ≈ 5 × 50 nS wide = 250 nS, T_F = 12 μS

$\frac{\Delta E}{E} = \frac{\Delta E}{4500} = \frac{2\sigma}{L} = \frac{2 \times 250}{12000}$ $\Delta E = \frac{1}{24} \times 4{,}600 = \frac{1150}{6} \pm 200$ V.

Source rolls to 4·42, 10 μA i_c

— set of pics at 50 nS/cm of Ar^{+} peak —— ~13 μS T_F

blank

" " " " " " " of Ar^{++} peak ~150 nS ~9·5 μS T_F

blank

Typ limiting resistor ~ 10 × 100 K = 1 MΩ for all above; 1 M × 10^{-6} = 10 V drop.

All above done with straight flight tube, no deflection for neutrals etc.

Pressure 10^{-6} Torr while running, $2 \cdot 10^{-7}$ before hand.

Set of pics at 4·78 KV, 40 μA

— analogue amp, + 50 nS/cm sweeps of Ar^{+} peak — broad

ph Nafion

i_c	10 μA	20 μA	30 μA	40 μA	50 μA	60 μA
V/s	4·43	4·53	4·63	4·74	4·83	4·94 ←

Tower still observed at ~2 μA (4·36 KV)

1 08/11/12

Fri 1/2/80

Southwicks gunnin still / 10^{-9}/60

ph Mofeth

ph x ~6 DIV ~9.5KV — zwolty

except a bit ph x 4 or 5

— no obvious large spots, just small spots / larger spots.

except up to 10 or 11 KV — still work

— flashed.

Lot of trouble extracting clay — ? stage misaligned completely.

5

1/2/80

An Source 30μA 4.57KV

2 spectrometer tilted ! - some problems with noise level.

- eventually 5μS/cm ph × ~6 analogue amp, .05 × 10 v/cm.

- digital amp 5 μS/cm - sets of ~6 with various discriminator settings.

blank

reduce i_c to 6μA - set of pulse dly amp.

remove filter from scope, more pts

→ 10 or 20μS/cm 1 or 2 pts

ph Naph

900°c/1hr/A cool

4/2/80 New Spec PE16/carbide treatment. 1109/60

ph Mfish

ph ×3 ~8-5KV — very oxide-covered spec.

ph ×3 after pushing

ph ×12

5037 ~axial (220 ish) 8·6 + 1·7 210/560 some Ve

~3K cm — 108

ph ×3 where 5037

— ? 2 dark bars

1AP ×2

more right 1AP ×2

Fe	65	500
Ni	66	540
Cr	63	510
Ti	61	490
Al	45	368
Mo	105	686
C'	30	285
C''	43	346

Fe 605

Cr

Cr

Ti

Al

dust

blank

Ni

Fe

Cr

Ti

Al

Mo

(No Mo after time round)

~9 + 1·7

IAP × 2

More right- IAP ×3 ⊙

? Nb 60, tricky to set up.

Fe

Cu

Tc

Al

Mo

Nb

Ze

Cr

Tc

Al

Mo

C12

C13 } v little

C6 10·1 + 2 ↑

IAP × 1 £

IAP × 2

Ru × 3

IAP × 2

~ centre IAP × 2 ⊙ ?

Nb

Ze

Cr

Tc

Al

Mo

Nb clad

Nb

Cr

Tc

Al

Mo

Cu
C6] v little

IAP x>

III LHS IAP x> (6)

Nc

Zr

Cr

Tc

Al

Mo

Ni

Fe

Cr

Ti

Al

Mo

C

IAP Nil 3

C a little s

IAP x>

h x>

IAP Acid x>

Nc 45s

Zr

Cr

Tc

Al

Mo

Ni

Fe

Cr

Ti

Al

M₀ 1

C₁₂ ~~120~~ 90s

C₆ 60s

MAP × 2or3

μ×3 ~12×~ .

Tues 5/2/90

Same PE16 /60 (5×10^{-9} warm - ugly!)

1×10^{-9} /60

538 300/560/Ne 12 + 2.4 — 12.1 + 2.57

— 2 ions locked out till 500 30 K

ph ×4 where 538

— wound up to ~15 KV - flashed

— extract

New Spectron PE16/5AH / γ' treatment — probably 4 hr @ 750°C

ph blank

ph × 2 5.6 KV — lots of γ'

ph × 2 6.05 KV on a γ'

537 5.4 + 1.4/3/Ne/ 140/560

5.4 + 1.4 145 @ 2K γ' clipping PH / thresh.

-5.75 + 1.4 150 3 K ions

ph × 3 where 537, 6.12 KV.

T540 150/520/Ne 5.4 - 5.6 + 1.4 from dimpt on RHS

— checked alignment at ~300 ions, ? disturbed it

~350 ions

ph × 2 where finished

ph × 1 moved

going home time!

ph Mysh

541 axial, ppt- 6+1.47 /var 160/560 — 6.7+1.55
→ show at 5K — 2 ppt.
165/120 6.7+1.6 — 6.55+1.75 24K

2 ph Mg/Al
ph ↑ → ~6.5
ph ↑ → 7.0

542 dim ppt to RHS of centre
170/560 6.6+1.7 var 1K
ph ↑ 2 show ↑ — ppt still there
ph ↑ 2 axial

84 Al 7 20
118 Ti
7 Cr
18 Fe
514 Ni
1 Mo

IAP → better left-

Fe 70
Ni 71
Cr 68
Ti 64
Al 47
Mo 107

Fe 60
Al
Cr
Ti
Mo
Ni
Fe
Cr
Ti
Al
Mo
Ni

var

Unknown 2
IAP →
→ centre IAP ×2

Long cl

Al
Mo
Al
Mo
Al
Mo
Al
Tc
Al
Tc
Al
Tc

IAP × 2 y' moved

short cl

Al
Tc
~~Mo~~ Cr
Al
Tc
Cr

IAP × 2 — y' gone.

Al
Cr
Tc
Mo
Ni
Fe
Al

IAP Mystery 3

IAP × 2

plus 7.4KV 5

T543 from odd looking region at top — ? 200 — spotty

2K 140/560 6.9B+2/vac

$\mu h \times 3$ — γ' come up empty

$\mu h \times 2$ original ~ 7 TeV

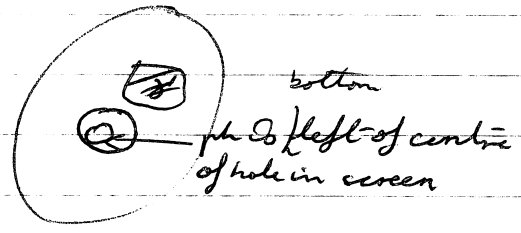
Fri 31
Same AE26

160/Ne

T544 180/560 var 6.4 + 1.9 γ' aligned on pole
~ 2K off γ' then into matrix
190/560 - 7.27 + 2
~ 5K total. var

566 Transfer 23

T545 Another γ' aligned on pole.
7 + 2 190/560 /200/560
spotted it up at ~ 2K var
8K
ph ~ 2 where 545
more slightly ph ~ 3 8.18 KV



91

Salt-

546 200/580 205/580 var
another γ' — 7.95 + 2

547 + - 210/560 — 8.2 + 2

215/580
548 210/560 var 8.1 + 2 — 8.4 + 2
— dim ppt

~ 4,500 seems to have left ppt — no Al, lots of Mo (comparatively)
— 10 K
μ x 2 where ↑ — ppt first to left-of pk ⊙
2C exempl - μ x 2 - axial 9.2 KV
μ x 2 < Div

Extract

NanoSpec PEG / 20 min γ' treatment SAH / No / 60
μ blank
μ x 2 5.4 KV

549 align on γ' 150/580 6.20 + 1.2 / var — v dim image, lots of H
~ 3K — 6.07 + 1.26
μ x 2 where 549 — γ' next pk.

μ Mofile good base line,

Mon 11/2/80 Some PE16/20 mins/SAFT 10^{-9}/60

γ' small 160/580 6.5 + 1.26 Mn

550 — 2nd channel looked out with 500 — 6.9 + 1.5 170/580

16K.

ph Mfish 2

ph x 3 or 4 than 550 ~ 6.3 KV

551 γ' a 180/560/Mn 6.9 + 1.5 — 6.85 Mn

3K

new γ' b " " 6.9 — 7.06 + 1.5 "

3K

552 longer γ' a 180/560 7.06 + 1.5 ^

small γ' b " — 7.1 + 1.5

553 a γ' 180/560 7 + 1.6 — 7.05 + 1.68 3K

b γ' 180/560 7.05 + 1.68 7.09 + 1.75 3K

ph x 5 than 553

ph x 2 small

Ni	72	580
Fe	71	
Cr	67	550
Tc	65	530
Al	47	396
Mo	112	740

↑ Fe

Al

↑ Cr

↑ Tc

Al

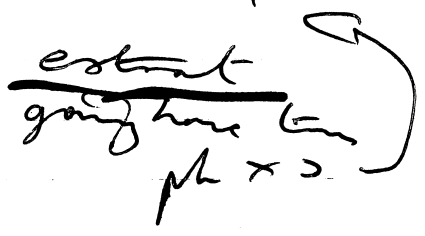
Tc

Cr

Γ

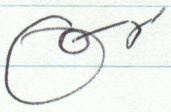
Al
Ti
Al
Ti
Mo
Ti
Mo
Ti
Mo
Ti
Cr
Ti
Cr
Ti
Cr
VAP ×4

7.4 + 1.8 mm



Tues 12/2/80 110^{9}/60/Ne

DE16/8hrs

ph × 2  9.6KV

554 ✓ δ' top right 9+2 230/560 var

2.1

v slow — spectrum γ-ray heavy 9+2.3 235/560

— 9.33+2.4 240/560

ph × 4 — at edge of, but still on, ppt (checked with detector image)

b 240/560 var ppt in centre of image

— 9.45+2.4

— v. slow at end + lots of H — still just on ppt 1 thou.

555 ✓ matrix 260/560 var 265/520

10+2.4 — 10.4+2.4

b small ppt 270/560/var 10.4+2.4

275/— → 10.8+2.5

ph ↔ where 553 b

ph × 1 moved slightly → ph still on ppt OK.

empt a bit

ph × 2 12KV

empt at 13.5KV ph × 1

ph × 1

{ small crops ~ ph × 4 or 5

1 HP × 4 A 

N_c 50 420 50

M_c 273 33

T_c 363 44

M_0 510 63

C_r 380 46

T_c 390 47

M_c

T_c

M_0

C_r

T_c

N_c

T_i

INAP Muñoz **B**

T_i

M_c

M_0

T_c

C_r 14.95 + 2.7 vm

INAP x 3

Mx 3 14.95 xv

estrant

M Muñoz

12/2/80

Tues Meeting Ni/Cr/Al 2 hrs /620C

ph Mg ph

ph x 3 7.35 KV

hole ppt 7.3+1.5 run 185/560

556 a short on ppt → lots of Cr / no ppt — stop at ~600 Cmg

b 190/560 ~7.3 +1.5 —

large ppt at bottom 2K

- 195 + 7.5 + 1.8

another ppt 557 a 2+7.7 200/570 run — 205/560

— just grey into matrix at 2K

b dark bit of matrix 205/560 7.9+2 run

pt still on matrix at end -7.8 +1.88 (went too far!)

ph x 2 8.15 KV

IAP x 2

Ni 60

Cr 60

Al 42

Cf 232 : 27

Cr 41

Cf 460 : 56

62 C

66 Al

900 Cr

660

Ni

Cr

Al

Cf lots

Ni

Cr

Al

Cf less

IAP x)

IAP² x)

N_1

C_n

A_1

~ 5 phases

? hdmg

± C – ~ little

N_1

C_n

A_1

IAP x)

– few small arrays left a bit

?

IAP x 3

IAP implem. 2

IAP x 1

N_c + S- (S. dmng)

C_n

AC

AL_9

C_6

N_1

C_0

AL

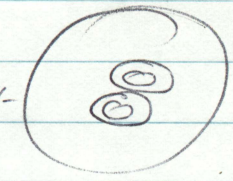
IAP² x 7

ph < 2

estruct

Wed 13 Mar Spec Ni Al Tc 1350 q / Aged 1 hr 625
1.10^{-7}/60/Ne

Few pins ph at ~ 6.3 KV
— series of apparent incoherent ppt



— tried to get spectrum

558 — ~1000 counts — v. slow ~ 6 + 1 160/580 grain

— gave up

— spec pegged to ~ 11 KV
ph × several
ph × several after cryo 11.5 KV

5

ppt in centre
559 10 + 2-2 260/580 rain
— 10.2 + 2.38 ~ 2 1/2 K
ph + 2

560 270/580 rain darker area on 111
a matrix 10.6 + 2.5
— 10.65 + 2.6

Al 268
Ti 189
Ni 2000

b bunch to ? ppt (close to 200 centre)
574 270/580 10.4 + 2.6 rain 10.5 + 2.6
944 ph x 2 ~ 2 K
move to bottom 220

561 another ppt 11.1 + 2.7 290/580 rain
~ 100 rains — flushed

N. Ar T_c Ar @ $2 \cdot 10^{-9}$/60

-spoilt

IAP => 6.8 KV III RHS

N_c 60,

T_c (

Ar

N_c (

T_c (

Ar (

IAP =>

left- IAP =>

N_c

T_c

Ar

N_c

T_c

(thumb Ar 7 + 1.3 mm

IAP =>

IAP => down a bit ~ 6.5

N_c

T_c

Ar

N_2

IAP N₂/Ar 2

N_2

T_c

Ar

IAP =>

N_2 =>

562 185/520 axial 220 id mm

7.3 + 1.5 ⟶ 8.3 + 2 210/560

~ 18 K

5136 ions out of tape 19.46

N => 8.8 KV gain to 300

= putting together dinner w/ II for Catherine,

5

heat treatment

Southwicks Endigyen

T560 a 9.0 + 1.8 2.5/560 lots of Ne ~60(T) 1.5 10⁻⁹

from centre - darkish ~2r 8 10⁻⁶ Ne

b from bottom 200 - brightish ~1K 10⁻⁶ "

— v. worm — extract again.

26/2/85

Same tip - cooler 1×10^{-9} / 60/Ne

ph × 2 ~ 11kV

IAP × 2 - elliptical.

St 7c	440
Cr 428	52
Si 310	37
Mo 570	~~570~~ 70

7c	60s
Cr	"
Si	"
7c	40s
Cr	"
Si	"
Si	"
Cr	"
7c	"
Mo	60s
Mo	60s
IAP × 2	
IAP × 2	
7c	
Cr	
Si	
Cr	
Si	
Mo	
Mo	- flash.

- tip OK -> 15kV

IAP flash 2

IAP × 2 15kV

Take up HT ph × 2 / ph × 2 15kV 17kV

*** ph × several 19kV - oxide erupting oxide melted

pk x2 18KV

IAP x 4 18KV

Cr

Si

? Cr

some order { Si

Zr

Mo

Mo

? Zr Cr

✓ Si

✓ Si

IAP x 2 18.6

pk x 2

pk x 2 — ? rubbish

IAP x 2 top right

Cr 35s

Zr

Cr

Si

Cr

Si

? Zr Mo

Mo

IAP x 2

Move down IAP x 1

Cr 45s

Si

Cr

Zr

Si

Si

Mo

Mo

IAP x 1

18.83+2.7

phase 2 MAP×1 —  ? bottom of zone c

Fe

Cr

MAP martensite

Fe

Cr

Si

Cr

Si

$C_{1.2}$?

M_6

MAP×2

T564 a 17.6 ± 2.7 J/m² from double bound at LITS

b from adjacent matrix

N 2K+2K

2 carbide

(can't get to it)

4g $Na_2Cr_2O_7$ +40cc acetic

14 v DC

or 3 HNO_3 : 1 H_2O < 5% Ac

$$\frac{100}{\frac{(At_1 \times M)}{M} + \frac{(At_2 \times M)}{M} + \dots} = m$$

wt% =

At%

17/7 PH Stainless Steel

0.074 C 0.54 Si 0.66 Mn 0.025 P

0.015 S 16.90 Cr 7.02 Ni 1.17 Al Fe 73.596 wt% 71.41 at%

C .335 Si 1.05 Mn .665 P .044 at%

S .025 Cr 17.66 Ni 6.465 Al 2.35

Patent Steel Wire

Wt% 0.84% C .21 Si .029 S .015 P .64 Mn

from same batch, but thicker wire.

PE16

Wt%	Cr	Ni	Mo	Fe	Al	Si	Ti	Mn	Co	Zr
	17.6	35.3	4.85	39.2	1.11	.02	1.12	.01	.03	.01
at wt	52.0	58.71	95.94	55.85	26.98	28.09	47.90	54.94	58.93	91.22
t%	19.25	34.20	2.88	39.92	2.34	.04	1.33	.01	.03	.006