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LAMPIRAN

LAMPIRAN A

Alat dan Bahan

1. Alat

Gambar 1. *Microwave*

Gambar 2. Gelas beaker

Gambar 3. Gelas Ukur 100 mL

Gambar 4. Cawan 75 mL

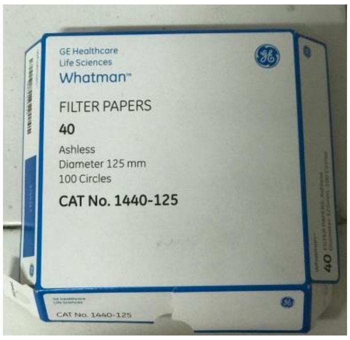
Gambar 5. Kuvet

Gambar 6. Botol Sampel

Gambar 7. Corong

Gambar 8. Spatula

Gambar 9. Neraca Analitis



Gambar 11. Kertas Saring Whatman

Gambar 11. Micro pipet

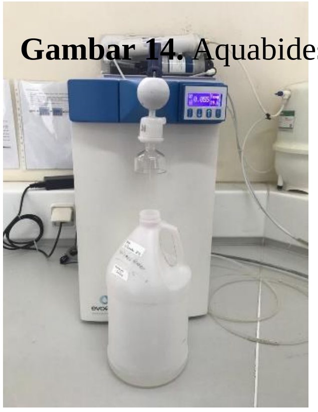
Gambar 12. Laser *point*

2. Bahan

Gambar 13. Bubuk Cokelat

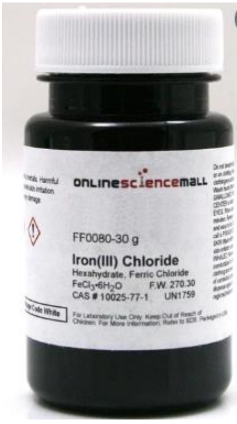
Gambar 14. Aquabides

Gambar 13. Bubuk Cokelat



Gambar 14. Aquabides

Gambar 15. Timbal Asetat



Gambar 16. Besi Klorida

LAMPIRAN B

Analisis Data

Tabel 1 Data hasil pengukuran Spektrometer UV-Vis untuk masin- masing CDs

Panjang Gelombang (nm)	Variasi Waktu		
	6 menit	7 menit	8 menit
235,63	1,5989	0,61852	1,9214
236,1	1,58645	0,61303	1,91629
236,57	1,56959	0,60807	1,90812
237,05	1,56441	0,60364	1,89883
237,52	1,55038	0,59975	1,85936
238	1,54685	0,59641	1,84621
238,47	1,53273	0,59326	1,85835
238,95	1,52164	0,59021	1,85013
239,42	1,51093	0,58687	1,83904
239,9	1,50165	0,58339	1,82905
240,37	1,51283	0,57979	1,8194
240,85	1,50073	0,57623	1,82882
241,32	1,48866	0,57275	1,81821
241,8	1,47836	0,56939	1,80987
242,27	1,48028	0,5661	1,80099
242,74	1,47331	0,5629	1,79401
243,22	1,46906	0,55984	1,78444
243,69	1,45967	0,55696	1,77442
244,17	1,45486	0,55424	1,77166
244,64	1,4454	0,55165	1,76444
245,12	1,44239	0,54919	1,76056
245,59	1,43859	0,54688	1,75792
246,07	1,43551	0,54471	1,74788
246,54	1,42713	0,5427	1,73918
247,01	1,41882	0,54084	1,73132
247,49	1,41429	0,53907	1,7272
247,96	1,40917	0,53746	1,72174
248,44	1,40141	0,53599	1,71307
248,91	1,39543	0,5347	1,70594
249,38	1,39132	0,53357	1,6985
249,86	1,38823	0,53261	1,69226
250,33	1,38172	0,5318	1,69093
250,81	1,37804	0,53114	1,69026
251,28	1,37175	0,53066	1,68389

251,75	1,3674	0,53034	1,68093
252,23	1,36472	0,53018	1,68064
252,7	1,3604	0,5302	1,67724
253,18	1,3575	0,53041	1,67487
253,65	1,35426	0,53079	1,66854
254,12	1,35058	0,53136	1,66551
254,6	1,34752	0,53209	1,66552
255,07	1,34542	0,53298	1,66608
255,55	1,34396	0,53403	1,66836
256,02	1,34196	0,53524	1,66813
256,49	1,34158	0,53662	1,66826
256,97	1,34085	0,53815	1,66619
257,44	1,34172	0,53983	1,66684
257,91	1,34187	0,54165	1,66782
258,39	1,34294	0,5436	1,67104
258,86	1,3437	0,54568	1,67336
259,33	1,34372	0,54788	1,67351
259,81	1,34453	0,55019	1,67285
260,28	1,34577	0,5526	1,67716
260,75	1,3458	0,55511	1,681
261,23	1,34757	0,55769	1,68375
261,7	1,34926	0,56033	1,68592
262,17	1,35154	0,56302	1,69029
262,65	1,35364	0,56576	1,69321
263,12	1,35533	0,56853	1,69653
263,59	1,35714	0,5713	1,70012
264,07	1,35938	0,57408	1,70368
264,54	1,3612	0,57684	1,70795
265,01	1,36267	0,57957	1,71327
265,49	1,36407	0,58225	1,71712
265,96	1,36568	0,58486	1,71985
266,43	1,36731	0,58739	1,72298
266,91	1,36853	0,58982	1,7262
267,38	1,36985	0,59214	1,72885
267,85	1,37143	0,59433	1,73168
268,33	1,37296	0,59638	1,73401
268,8	1,37456	0,59827	1,73568
269,27	1,3759	0,59998	1,73758
269,75	1,37638	0,60151	1,73894
270,22	1,37665	0,60284	1,74134
270,69	1,37669	0,60396	1,74185

271,16	1,37644	0,60486	1,7417
271,64	1,37608	0,60552	1,74098
272,11	1,37466	0,60594	1,74067
272,58	1,3738	0,60611	1,73894
273,06	1,37229	0,60601	1,73631
273,53	1,36977	0,60564	1,7353
274	1,36688	0,605	1,73231
274,47	1,36379	0,60408	1,72931
274,95	1,36047	0,60288	1,72433
275,42	1,35679	0,60138	1,719
275,89	1,35287	0,59959	1,71294
276,36	1,34809	0,5975	1,70689
276,84	1,34277	0,59512	1,6998
277,31	1,33722	0,59245	1,69235
277,78	1,33092	0,58948	1,68393
278,25	1,32474	0,58622	1,67492
278,73	1,31785	0,58267	1,66493
279,2	1,31011	0,57885	1,65548
279,67	1,30177	0,57475	1,64519
280,14	1,29361	0,57038	1,63466
280,62	1,28566	0,56575	1,62273
281,09	1,27671	0,56087	1,61028
281,56	1,26723	0,55574	1,5975
282,03	1,25716	0,55037	1,58501
282,51	1,24721	0,54478	1,57148
282,98	1,23668	0,53898	1,55634
283,45	1,22647	0,53297	1,54203
283,92	1,21508	0,52678	1,52743
284,39	1,20402	0,52041	1,51109
284,87	1,19225	0,51387	1,49397
285,34	1,17988	0,50719	1,47793
285,81	1,1679	0,50038	1,46029
286,28	1,15577	0,49345	1,44379
286,76	1,1436	0,48642	1,42725
287,23	1,13065	0,4793	1,4113
287,7	1,1181	0,47211	1,39356
288,17	1,10502	0,46487	1,3768
288,64	1,09302	0,45759	1,36021
289,11	1,08071	0,45028	1,34405
289,59	1,06772	0,44296	1,32712

Tabel 2 Data hasil pengukuran Spektrometer *Photoluminescence* dengan variasi waktu (6 menit, 7 menit, 8 menit).

Panjang Gelombang (nm)	Variasi Waktu		
	6 menit	7 menit	8 menit
450,88	19117,89	20933,6	16043,58
451,34	19219,18	21053,67	16133,98
451,79	19331,01	21179,38	16229,1
452,24	19441,64	21300,71	16322,38
452,7	19551,15	21432,11	16422,56
453,15	19662,63	21561,91	16522,53
453,61	19768,43	21686,87	16618,31
454,06	19863,47	21799,79	16702,63
454,51	19976,23	21927,79	16801,84
454,97	20072,04	22039,69	16884,35
455,42	20181,08	22166,74	16984,98
455,87	20288,98	22293,74	17082,64
456,33	20384,51	22404,13	17165,83
456,78	20479,73	22518,86	17248,87
457,23	20576,41	22633,83	17334,62
457,69	20678,98	22749,92	17424,2
458,14	20759,71	22849,61	17496,22
458,6	20837,11	22946,28	17562,03
459,05	20919,17	23048,62	17634,17
459,5	20994,69	23143,6	17701,82
459,96	21082,72	23251,38	17779,81
460,41	21160,48	23347,58	17849,32
460,86	21242,25	23446,26	17924,64
461,32	21328,27	23550,5	18002,07
461,77	21394,63	23635,4	18063,63
462,22	21462,64	23721,44	18120,54
462,68	21533,28	23810,25	18183,1
463,13	21595,04	23894,9	18237,56
463,58	21656,05	23978,74	18292,24
464,04	21720,97	24062,33	18349,19
464,49	21781,09	24140,72	18404,31
464,94	21837,08	24220,53	18455,6
465,39	21889,2	24295,51	18504,27
465,85	21955,19	24380,27	18563,1
466,3	21981,72	24431,02	18581,23

466,75	22026,69	24497,7	18625,96
467,21	22073,14	24571,03	18671,35
467,66	22115,25	24637,21	18712,21
468,11	22155,14	24700,42	18750,57
468,57	22192,2	24758,44	18783,37
469,02	22240,52	24829,07	18828,46
469,47	22281,54	24887,31	18864,52
469,92	22323,22	24950,72	18899,46
470,38	22360,68	25013,16	18935,24
470,83	22397,3	25070,19	18967,79
471,28	22440,69	25134,65	19007,09
471,73	22474,56	25195,4	19041,23
472,19	22501,82	25248,57	19065,85
472,64	22528,48	25299,26	19093,82
473,09	22544,81	25339,47	19110,76
473,55	22572,68	25396,17	19137,16
474	22605,51	25452,96	19171,72
474,45	22633,96	25502,58	19197,33
474,9	22651,98	25548,28	19216,5
475,36	22677,01	25601,11	19240,67
475,81	22701,81	25648,89	19265,44
476,26	22718,49	25695,4	19286,87
476,71	22729,87	25733,48	19298,92
477,16	22754,98	25781,38	19325,33
477,62	22763,56	25812,74	19331,43
478,07	22784,61	25860,11	19351,06
478,52	22791,66	25890,16	19355,2
478,97	22798,03	25927,52	19366,39
479,43	22806,27	25963,92	19374,61
479,88	22819,98	26002,19	19386,32
480,33	22827,63	26035,17	19395,89
480,78	22847,71	26078,86	19418,3
481,24	22845,43	26104,68	19420,03
481,69	22847,75	26132,23	19429,85
482,14	22856,54	26158,98	19443,51
482,59	22869,1	26192,92	19462,97
483,04	22873,22	26218,73	19472,32
483,5	22874,86	26234,09	19477,79
483,95	22884,19	26266,1	19497,63
484,4	22884,81	26288,35	19507,01
484,85	22896,94	26319,46	19529,32

485,3	22906,72	26348,84	19547,58
485,75	22921,72	26380,81	19574,61
486,21	22925,86	26402,43	19589,29
486,66	22937,28	26432,69	19611,44
487,11	22958,31	26469,72	19642,69
487,56	22958,53	26487,74	19654,83
488,01	22964,8	26507,9	19673,96
488,47	22969,96	26528,68	19692,55
488,92	22970,84	26546,4	19705,85
489,37	22965,86	26558,9	19712,92
489,82	22943,99	26554,62	19705,71
490,27	22940,42	26561,21	19712,81
490,72	22933,01	26574,72	19725,59
491,18	22938,19	26591,24	19745,81
491,63	22931,28	26597,14	19749,84
492,08	22930,3	26612,81	19767,29
492,53	22950,5	26644,69	19798,75
492,98	22940,93	26653,48	19807,08
493,43	22938,15	26668,66	19820,81
493,88	22924,48	26669,2	19819,38
494,34	22903,53	26661,79	19812,04
494,79	22890,77	26660,77	19811,99
495,24	22864,09	26647,8	19798,74
495,69	22840,88	26639,92	19789,28
496,14	22829,78	26643,52	19793,96
496,59	22822,42	26647,05	19797,83
497,04	22804,13	26638,8	19791,83
497,49	22782,11	26629,81	19782,8
497,94	22766,58	26624,11	19782,27
498,4	22739,37	26604,74	19770,44
498,85	22710,71	26584,72	19757,23
499,3	22696,51	26578,99	19755,98
499,75	22685,49	26576,98	19759,33
500,2	22659,23	26559,81	19750,32
500,65	22651,43	26556,77	19760,3
501,1	22632,87	26541,99	19758,61
501,55	22609,92	26524,43	19750,6
502	22587,12	26508,01	19740,16
502,45	22558,31	26483,88	19725,97
502,91	22528,92	26456,38	19710,47
503,36	22487,84	26425,35	19687,86

503,81	22457,55	26403,01	19679,04
504,26	22432,75	26378,68	19668,74
504,71	22412,95	26360,56	19665,02
505,16	22367,22	26321,22	19638,23
505,61	22325,25	26281,43	19610,85
506,06	22304,03	26256,77	19602,59
506,51	22273,59	26226,34	19588,08
506,96	22226,21	26183,37	19557,33
507,41	22215,33	26173,17	19565,84
507,86	22182,04	26139,85	19544,5
508,31	22148,41	26105,59	19524,27
508,76	22116,89	26071,79	19506,47
509,21	22081,32	26033,45	19487,32
509,66	22044,7	25996,93	19464,61
510,12	21998,18	25947,03	19432,12
510,57	21973,43	25918,14	19423,07

Tabel 3 Data hasil pengukuran TEM dengan variasi waktu 7 menit

Ukuran area dari CDs didapatkan dengan aplikasi imageJ, kemudian untuk mendapatkan diameter digunakan persamaan luas lingkaran menggunakan *Ms. Excel*

$r^2 = \frac{area}{\pi}$

$= 5,49/3,14$

$= 1,75\ nm^2$

$r = \sqrt{r^2}$

$= \sqrt{1,75}$

$= 1,32\ nm$

$d = 2 \times r$

$= 2,64\ nm$

Area	r^2	r	d
5,49	1,75	1,32	2,64
7,565	2,41	1,55	3,10
5,043	1,61	1,27	2,53
6,515	2,07	1,44	2,88
5,201	1,66	1,29	2,57
20,699	6,59	2,57	5,13

21,566	6,86	2,62	5,24
5,332	1,70	1,30	2,61
14,763	4,70	2,17	4,34
5,149	1,64	1,28	2,56
6,226	1,98	1,41	2,82
5,227	1,66	1,29	2,58
7,46	2,37	1,54	3,08
7,355	2,34	1,53	3,06
5,411	1,72	1,31	2,62
5,464	1,74	1,32	2,64
14,369	4,57	2,14	4,28
6,226	1,98	1,41	2,82
12,556	4,00	2,00	4,00
8,957	2,85	1,69	3,38
14,842	4,72	2,17	4,35
15,498	4,93	2,22	4,44
6,173	1,96	1,40	2,80
18,256	5,81	2,41	4,82
7,486	2,38	1,54	3,09
17,311	5,51	2,35	4,69
11,663	3,71	1,93	3,85
11,794	3,75	1,94	3,88
5,411	1,72	1,31	2,62
6,173	1,96	1,40	2,80
13,213	4,21	2,05	4,10
16,47	5,24	2,29	4,58
7,171	2,28	1,51	3,02
5,306	1,69	1,30	2,60
14,815	4,72	2,17	4,34
6,646	2,12	1,45	2,91
11,453	3,65	1,91	3,82
15,63	4,98	2,23	4,46
8,196	2,61	1,62	3,23
13,607	4,33	2,08	4,16
9,299	2,96	1,72	3,44
5,858	1,86	1,37	2,73
16,523	5,26	2,29	4,59
18,388	5,85	2,42	4,84
5,726	1,82	1,35	2,70
10,323	3,29	1,81	3,63
19,596	6,24	2,50	5,00

17,468	5,56	2,36	4,72
6,646	2,12	1,45	2,91
10,586	3,37	1,84	3,67
26,478	8,43	2,90	5,81
16,654	5,30	2,30	4,60
5,438	1,73	1,32	2,63
11,4	3,63	1,90	3,81
12,241	3,90	1,97	3,95
6,62	2,11	1,45	2,90
7,014	2,23	1,49	2,99
8,747	2,78	1,67	3,34
5,254	1,67	1,29	2,59
5,227	1,66	1,29	2,58
6,698	2,13	1,46	2,92
12,32	3,92	1,98	3,96
22,748	7,24	2,69	5,38
17,757	5,65	2,38	4,75
7,88	2,51	1,58	3,17
6,593	2,10	1,45	2,90
7,67	2,44	1,56	3,13
11,768	3,75	1,94	3,87
18,545	5,90	2,43	4,86
16,076	5,12	2,26	4,52
13,029	4,15	2,04	4,07
17,547	5,59	2,36	4,73
5,464	1,74	1,32	2,64
12,057	3,84	1,96	3,92
5,359	1,71	1,31	2,61
6,383	2,03	1,43	2,85
15,945	5,08	2,25	4,51
6,882	2,19	1,48	2,96

Tabel 4 Data *Sensitivitas Carbon Dots* + Fe^{3+}

$$\frac{F}{F_0} = 1 - \frac{Intensisas\ Cds\ murni + logam\ berat}{Intensitas\ Cds\ murni}$$

$$= 1 - \frac{16338{,}24}{16787{,}28}$$

= 0.02362

Konsentrasi Penambahan Fe^{3+}	Intensitas	$\frac{F}{F_0}$
2.5×10^{-5}	16338,24	0,02362
2.5×10^{-4}	14027,02	0,16174
2.5×10^{-3}	13940,54	0,1669
5×10^{-3}	13044,88	0,31811
2.5×10^{-2}	11117,70	0,3356
5×10^{-2}	12025,70	0,37138
0	16787,28	0

Tabel 5 Data *Sensitivitas Carbon Dots* + Pb^{2+}

$$\frac{F}{F_0} = 1 - \frac{Intensitas\ Cds\ murni + logam\ berat}{Intensitas\ Cds\ murni}$$

$$= 1 - \frac{15763,10}{16787,28}$$

= 0,05799

Konsentrasi Penambahan Fe^{3+}	Intensitas	$\frac{F}{F_0}$
2.5×10^{-5}	15763,10	0,05799
2.5×10^{-4}	15014,61	0,10272
2.5×10^{-3}	16947,32	0,11411
5×10^{-3}	14017,51	0,14956
2.5×10^{-2}	14230,68	0,1623
5×10^{-2}	14652,35	0,23408
0	16787,28	0