

## LAMPIRAN 1

### DATA TKS 100%

NO	VOLUME (CM)	WAKTU (MENIT)	TENPERATUR (°C)
1	50	6,20	94
2	50	9,20	142
3	50	12,10	187
4	50	14,20	221
5	50	15,40	242
6	50	16,50	258
7	50	17,40	270
8	50	19,00	288
9	50	19,20	295
10	50	19,50	302
11	50	20,20	308
12	50	20,40	314
13	50	21,10	321
14	50	21,40	327
15	50	22,10	333
16	50	22,40	339
17	50	23,00	345
18	50	1,35	351
19	50	24,00	358
20	50	24,20	365
21	50	25,00	371
22	50	25,30	378
23	50	26,00	385
24	50	26,30	391
25	50	27,00	398
26	50	27,50	406
27	50	29,00	420
28	50	30,30	435
29	50	31,30	446
30	50	32,30	456
31	50	33,30	466
32	50	34,20	474
33	50	35,10	483
34	50	36,00	490
35	50	36,40	498
36	50	37,30	505
37	50	38,10	512
38	50	39,10	520
39	50	40,00	528
40	50	41,10	538
41	50	42,20	547

42	50	43,30	556
43	50	44,40	566
44	50	45,40	574
45	50	47,10	584
46	50	48,20	593
47	50	49,50	602
48	50	51,10	612
49	50	52,40	622
50	50	54,10	631
51	50	55,50	641
52	50	57,40	652
53	50	59,30	662
54	50	61,40	674
55	50	63,40	684
56	50	66,00	695
57	50	68,00	700
58	50	70,30	700
59	50	74,20	700
60	50	79,10	700
61	50	86,10	700
62	50	94,20	700
63	50	104,00	700
64	50	116,50	700
65	11	120,00	700

## LAMPIRAN 2

### DATA TKS + 10% BENTONIT

NO	VOLUME (CM)	WAKTU (MENIT)	TENPERATUR (°C)
1	50	5,40	86
2	50	8,20	129
3	50	11,00	170
4	50	13,00	203
5	50	14,50	229
6	50	15,50	245
7	50	17,00	260
8	50	17,50	272
9	50	18,40	281
10	50	19,20	290
11	50	20,00	301
12	50	20,30	308
13	50	21,00	315
14	50	21,30	321
15	50	22,00	329
16	50	22,30	335
17	50	23,00	341
18	50	23,30	348
19	50	24,00	354
20	50	24,30	360
21	50	24,50	365
22	50	25,20	370
23	50	25,50	375
24	50	26,10	381
25	50	26,40	386
26	50	27,00	391
27	50	27,30	398
28	50	27,50	401
29	50	28,20	406
30	50	28,50	412
31	50	29,10	416
32	50	29,40	419
33	50	30,00	423
34	50	30,20	427
35	50	30,50	432
36	50	31,30	437
37	50	32,00	442
38	50	32,40	448
39	50	33,30	455
40	50	34,20	463
41	50	35,10	470

42	50	36,10	478
43	50	37,00	486
44	50	38,00	494
45	50	39,00	501
46	50	40,00	510
47	50	40,50	516
48	50	41,50	524
49	50	42,50	532
50	50	44,10	541
51	50	45,30	550
52	50	46,50	559
53	50	48,20	570
54	50	49,50	580
55	50	51,20	590
56	50	53,00	600
57	50	54,30	610
58	50	56,20	620
59	50	58,00	630
60	50	59,40	640
61	50	61,30	650
62	50	63,30	660
63	50	65,20	669
64	50	67,20	678
65	50	69,20	688
66	50	71,40	697
67	50	74,10	700
68	50	78,00	700
69	50	84,30	700
70	50	97,00	700
71	50	113,20	700
72	26	120,00	700

### LAMPIRAN 3

#### DATA TKS + 30% BENTONIT

NO	VOLUME (CM)	WAKTU (MENIT)	TENPERATUR (°C)
1	50	5,50	99
2	50	9,20	157
3	50	11,10	187
4	50	12,10	200
5	50	13,10	218
6	50	13,50	227
7	50	14,30	238
8	50	15,00	248
9	50	15,40	254
10	50	16,00	261
11	50	16,30	266
12	50	16,50	273
13	50	17,10	278
14	50	17,40	284
15	50	18,00	289
16	50	18,20	294
17	50	18,40	298
18	50	19,00	305
19	50	19,20	309
20	50	19,40	314
21	50	20,00	319
22	50	20,30	324
23	50	20,50	329
24	50	21,10	334
25	50	21,30	339
26	50	22,00	344
27	50	22,20	349
28	50	22,50	355
29	50	23,20	361
30	50	23,50	367
31	50	24,30	375
32	50	25,10	383
33	50	26,00	392
34	50	26,50	401
35	50	27,30	410
36	50	28,20	418
37	50	29,10	428
38	50	30,00	438
39	50	31,00	447
40	50	31,50	457
41	50	32,50	466

42	50	34,00	477
43	50	35,10	489
44	50	36,30	501
45	50	37,50	513
46	50	39,00	524
47	50	40,10	534
48	50	41,20	543
49	50	42,40	555
50	50	43,50	566
51	50	45,10	577
52	50	46,50	587
53	50	48,20	598
54	50	49,50	609
55	50	51,30	620
56	50	53,00	632
57	50	54,50	642
58	50	56,40	654
59	50	58,20	664
60	50	60,10	674
61	50	62,10	685
62	50	65,00	700
63	50	69,40	700
64	50	71,30	700
65	50	73,20	700
66	50	76,20	700
67	50	80,20	700
68	50	83,30	700
69	50	86,10	700
70	50	91,20	700
71	50	98,00	700
72	50	104,00	700
73	50	120,00	700

#### LAMPIRAN 4

#### DATA TKS + 50% BENTONIT

NO	VOLUME (CM)	WAKTU (MENIT)	TENPERATUR (°C)
1	50	4,50	67
2	50	6,20	88
3	50	7,30	107
4	50	8,50	125
5	50	9,50	144
6	50	11,10	163
7	50	12,10	180
8	50	13,10	193
9	50	14,20	210
10	50	15,20	224
11	50	16,10	236
12	50	16,50	246
13	50	17,30	255
14	50	18,10	264
15	50	18,40	271
16	50	19,10	278
17	50	19,40	284
18	50	20,10	290
19	50	20,30	296
20	50	21,00	301
21	50	21,20	306
22	50	21,50	312
23	50	22,00	317
24	50	22,20	320
25	50	22,50	325
26	50	23,10	330
27	50	23,20	332
28	50	23,40	337
29	50	24,00	342
30	50	24,20	346
31	50	24,40	350
32	50	25,00	354
33	50	25,20	359
34	50	25,50	363
35	50	26,10	369
36	50	26,40	374
37	50	27,20	382
38	50	28,00	391
39	50	28,50	399
40	50	29,40	408
41	50	30,30	417

42	50	31,10	427
43	50	31,50	434
44	50	32,40	441
45	50	33,20	448
46	50	34,10	457
47	50	35,10	466
48	50	36,20	477
49	50	37,20	488
50	50	38,40	498
51	50	39,50	509
52	50	41,00	520
53	50	42,20	531
54	50	43,30	541
55	50	44,50	551
56	50	46,10	562
57	50	47,30	572
58	50	48,50	582
59	50	50,20	592
60	50	51,50	603
61	50	53,10	612
62	50	54,40	622
63	50	56,10	631
64	50	57,50	641
65	50	59,20	650
66	50	61,00	660
67	50	62,50	670
68	50	64,30	678
69	50	66,20	687
70	50	68,20	696
71	50	70,10	700
72	50	75,20	700
73	50	83,00	700
74	50	92,10	700
75	50	105,00	700
76	50	119,40	700
77	9	120,00	700

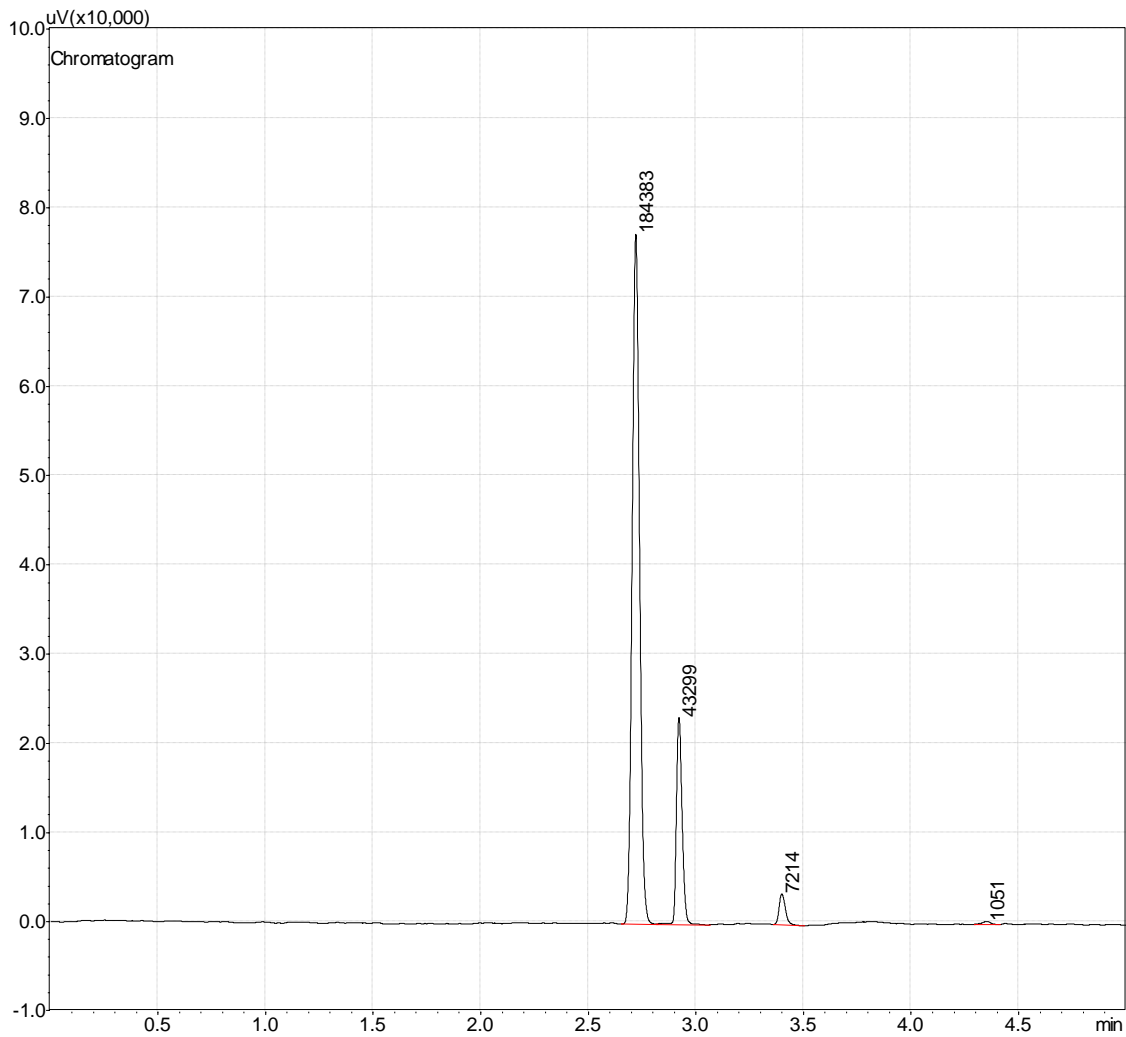


LAMPIRAN 5

DATA KOMPOSISI SYNGAS

Analysis date & Time : Monday, February 14 2018

Sample Name : TKS 100% = 700 C

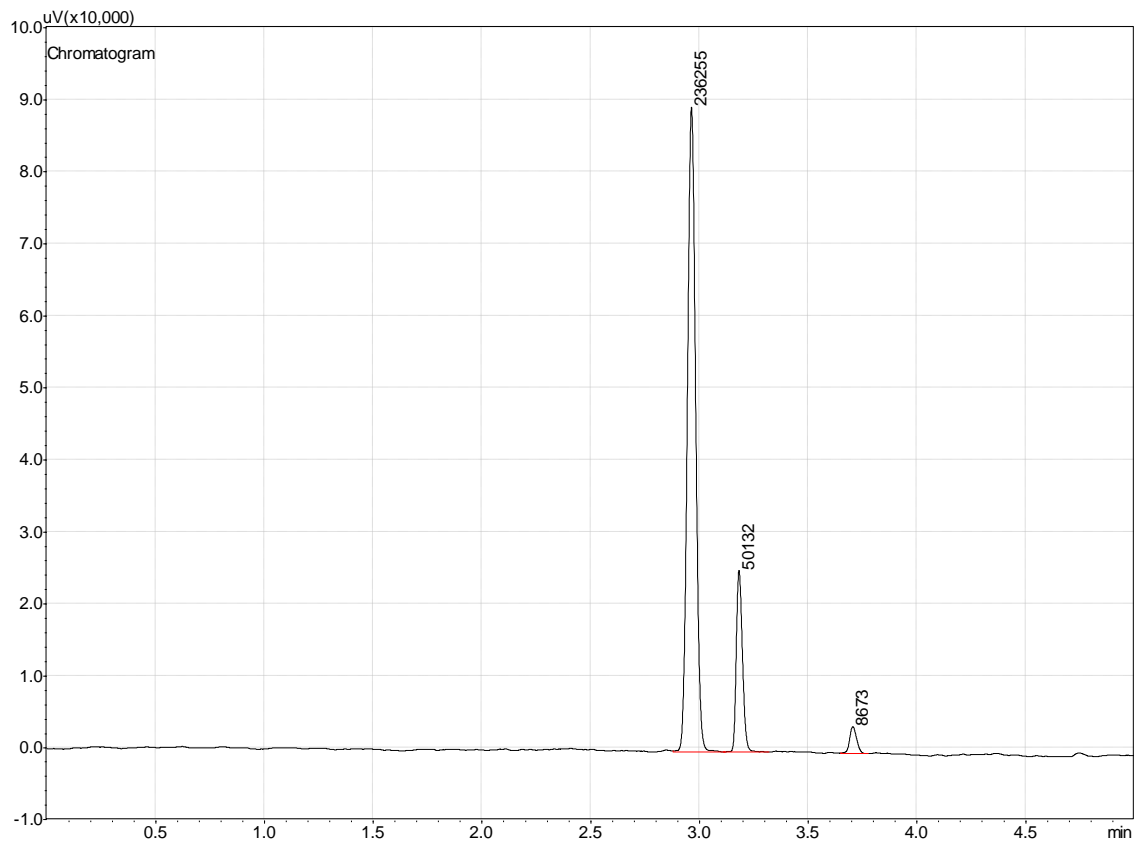


Peak#	Area	Ret. Time	Area%	Height	Conc. %	Name
1	184383.2	2.721	78.1462	76586.4	33.195	Hydrogen
2	43298.9	2.921	18.3511	22941.3	60.394	Methane
3	7213.8	3.399	3.0574	3488.6	6.411	Carbondioxide
4	1050.6	4.351	0.4453	361.4		

LAMPIRAN 6

Analysis date &Time : Monday, February 12 2018

Sample Name : Tkks 100% + KB 10%

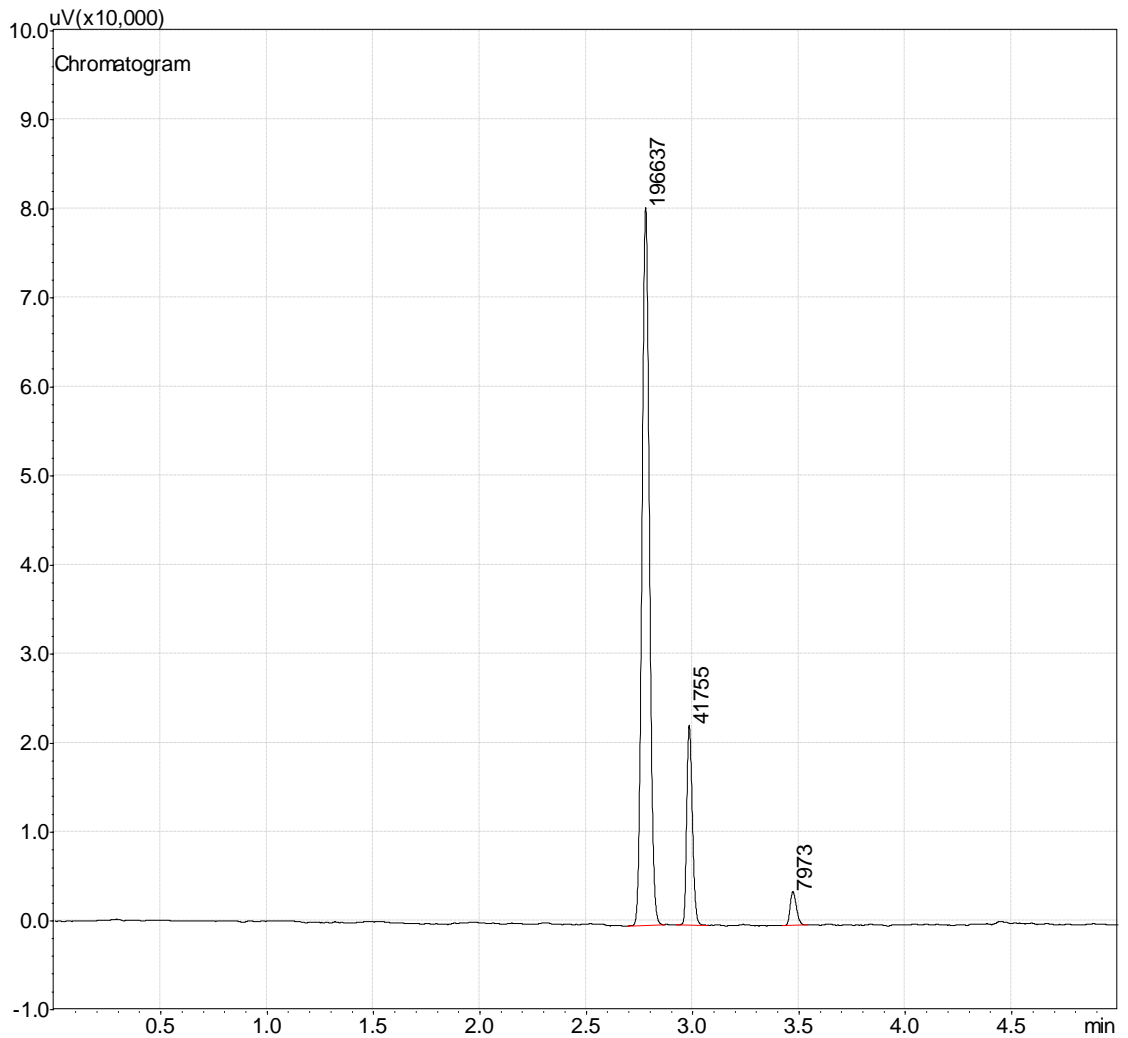


Peak#	Area	Ret. Time	Area%	Height	Conc. %	Name
1	236254.5	2.963	80.0701	88968.2	34.618	Hydrogen
2	50131.8	3.182	16.9904	25114.4	59.335	Methane
3	8673.4	3.705	2.9395	3762.8	6.047	Carbondioxide

LAMPIRAN 7

Analysis date & Time : Monday, February 19 2018

Sample Name : TKS 50% - KB 30% = 700C

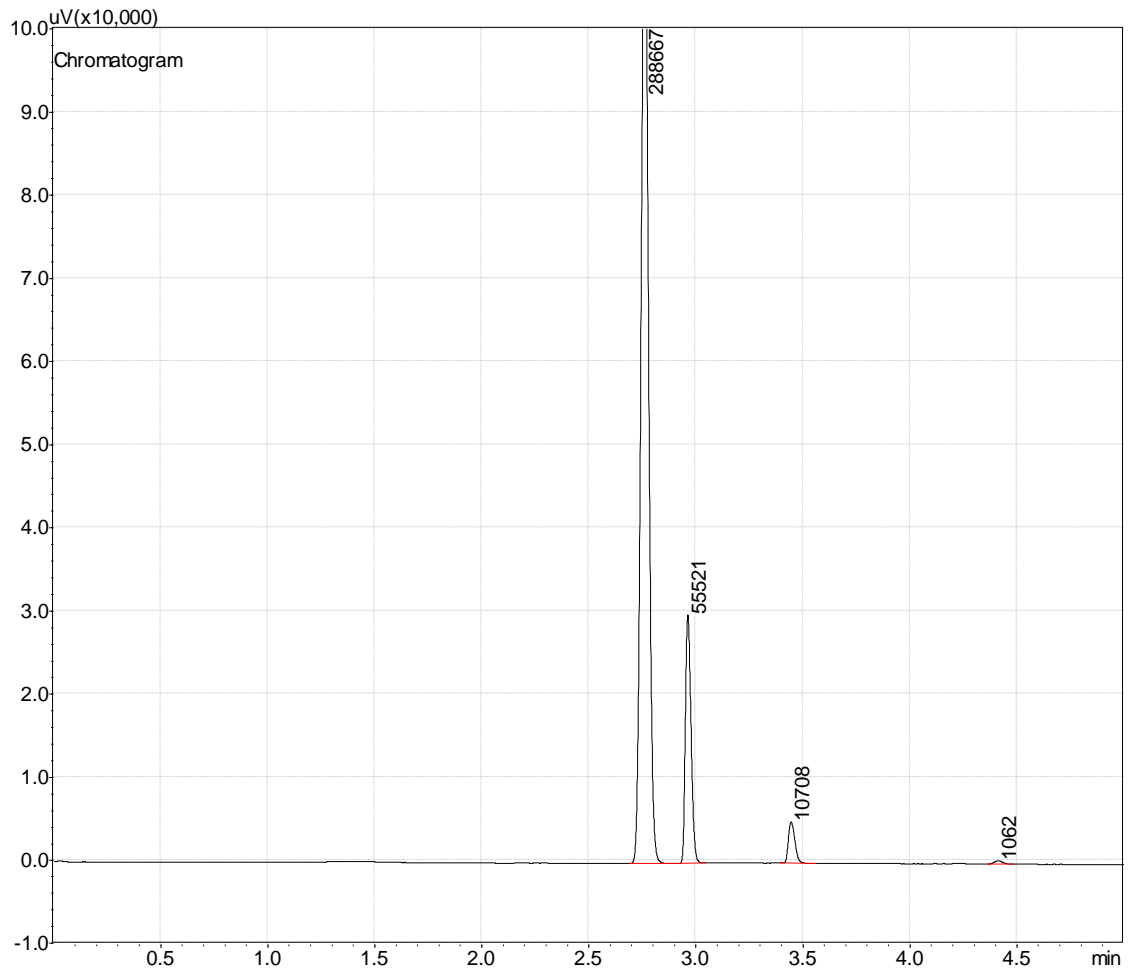


Peak#	Area	Ret. Time	Area%	Height	Conc. %	Name
1	196637.1	2.779	79.8153	80303.6	34.794	Hydrogen
2	41755.4	2.984	16.9486	22286.8	58.495	Methane
3	7972.7	3.471	3.2361	3825.8	6.711	Carbondioxide

LAMPIRAN 8

Analysis date &Time : Monday, February 14 2018

Sample Name : TKS100% + KB 50% = 700C



Peak#	Area	Ret. Time	Area%	Height	Conc. %	Name
1	288666.9	2.761	81.0958	119138	36.152	Hydrogen
2	55520.9	2.962	15.5976	29763.1	57.836	Methane
3	10708.5	3.445	3.0083	4922.4	6.011	Carbondioxide
4	1061.9	4.412	0.2983	388.1		

## LAMPIRAN 9

**Table 2.** Calorific values in MJ/Nm<sup>3</sup>.

Component	H2	CO	CH4	C2H6	C2H4	C2H2	Company
<b>HHV</b>	12.745	12.633	39.819	70.293	63.414		TU Wien
	12.769	12.622	39.781	69.693	63	58.059	NREL
	12.753	12.626	39.721	69.595	62.952		ECN
	12.766	12.641	39.847	70.402	63.998	58.975	DMT
	12.761	12.634	39.747	69.636	62.989	58.039	Carbona
	12.76	12.617	39.663	69.511	63.042	57.934	Univ. Sherbrook
	12.758	12.631	39.739				Vattenfall
	12.761	12.634	39.75	69.642	62.994	58.022	Nykomb
<b>LHV</b>	10.783	12.633	35.883	64.345	59.457		TU Wien
	10.788	12.622	35.814	63.748	59.036	56.078	NREL
	10.789	12.626	35.796	63.704	59.024		ECN
	10.8	12.6	35.8	63.71		56.03	Verenum
	10.757	12.641	35.787	64.333	59.938	56.924	DMT
	10.748	12.634	35.725	63.605	59.011	56.028	Carbona
	10.793		35.81				Vattenfall
	10.8	12.634	35.823	63.756	59.07	56.06	Nykomb
	10.797	12.635	35.821	63.749	59.068		TPS
	10.789	12.630	35.812	63.744	59.033	56.088	Bioelettrica
Component	C3H8	C3H6	i-C4H8	i-C4H10	n-C4H10	C6H6	Company
<b>HHV</b>	101.242	93.576	125.088	133.119	134.061		TU Wien
	99.091	91.879				142.893	NREL
						147.299	ECN
	101.794	94.343	121.843	131.972	133.981	146.329	DMT
	99.108	91.894		128.502		147.385	Carbona
	98.244					147.143	Univ. Sherbrook
99.116	91.902	120.696	128.207	128.513	147.398	Nykomb	
<b>LHV</b>	93.215	87.575	116.934	122.91	123.81		TU Wien
	91.163	85.934				141.41	NREL
						141.408	ECN
	93.548	88.191	113.806	121.592	123.517	140.301	DMT
	91.066	85.862		118.449		141.352	Carbona
	91.268	86.016	112.848	118.703	118.703	141.512	Nykomb
	91.164	85.925	113.371	117.668	118.569	159.502	Bioelettrica
Component	NH3	H2S					Company
<b>HHV</b>	13.072	25.105					ECN
		25.07					Kvaerner
	17.245	25.7					DMT
	17.094	25.123					Carbona
	25.096					Nykomb	
<b>LHV</b>	10.128	23.142					ECN
		23.12					Kvaerner
	14.189	23.69					DMT
	14.079	23.134					Carbona
	14.132	23.152					TPS
14.136	23.113					Bioelettrica	

# **LAMPIRAN**