LAMPIRAN

Lampiran 1. Kuantitas Produktivitas

Presentase Hasil Pirolisis								
Variasi Temperatur	Persentase Arang (%)	Presentase Minyak (%)	Parafin (%)	Presentase Gas (%)	Av. Arang	Av. Minyak	Av. Wax	Av. Gas
500	13,9	15,4	8,8	61,9	13,9	14,35	10,4	61,35
	13,9	13,3	12	60,8				
475	14,3	7,5	19	59,1	14,7	7,2	19,2	58,85
	15,1	6,9	19,4	58,6				
450	20,3	8,5	7,7	63,5	19,7	7,55	7,4	64,3
	19,1	6,6	7,1	65,1				
425	17,5	16	9,3	57,1	17,05	12,25	12,4	58,25
	16,6	8,5	15,5	59,4				
400	17,5	6,5	19	57	20,25	7,25	16,55	56
	23	8	14,1	55				

Lampiran 2.Nilai Densitas Pyrolytic-oil

NO	VARIASI	GELAS UKUR	NSITAS BIO-(	VOLUME	HASIL	SATUAN	DATA TABEL	
		gr	gr	ml	gr/ml		Variasi Temperatur	Densitas
5	400	26,1	50	30	0,80	g/ml	400°C	796,67
4	425	26,1	48,8	30	0,76	g/ml	425°C	756,67
3	450	26,1	53,3	30	0,91	g/ml	450°C	906,67
2	475	26,1	52,3	30	0,87	g/ml	475°C	873,33
1	500	26,1	51,2	30	0,84	g/ml	500°C	836,67

Lampiran 3. Nilai Keasaman Pyrolytic-oil

DATA TABEL		PERCOBAAN	
Variasi Temperatur	Keasaman	1	2
400°C	5,65	5,70	5,60
425°C	8,60	8,70	8,50
450°C	6,20	6,10	6,30
475°C	5,70	5,60	5,80
500°C	5,70	5,70	5,70

Lampiran 4 .Viskositas Pyrolytic-oil

Variasi Temperatur °C	Percobaan	
	1	2
400°C	1,5	1,4
425°C	1,6	1,9
450°C	2,2	2,2
475°C	1,2	1,2
500°C	4,9	4,8

Lampiran 5.Nilai Kalor Pyrolytic-oil

Variasi Temperatur	Pengujian 1				Pengujian 2		
	Massa	Nilai kalor (cal/gr)	Nilai kalor (MJ/Kg)	Data tabel Rata-rata	Massa	Nilai kalor (cal/gr)	Nilai kalor (MJ/Kg)
400℃	0,7113	9195,670	38,502	35,571	0,7172	7795,5143	32,640
425℃	0,1745	10463,161	43,809	43,780	0,7116	10449,1650	43,751
450℃	0,7146	5611,131	23,494	25,823	0,7107	6723,8486	28,153
475℃	0,7182	8133,554	34,055	32,834	0,7172	7550,1461	31,612
500℃	0,7162	10609,028	44,420	44,506	0,7154	10650,10748	44,592

Lampiran 6. Senyawa Penyusun Pyrolytic-oil (GC-MS) Temperatur 400°C

Peak	Area (%)	Nama	Formula	Golongan
1	0,82	1-Heptene	C7H14	Alkena
2	0,52	2-Octyn-1-ol	C8H14O	Alkohol
3	0,70	Benzene, Methyl-	C7H8	Aromatik
4	0,91	2-Octene	C8H16	Alkena
5	0,49	Cyclohexane, propyl-	C9H18	Alkena
6	0,70	1-Heptene, 5-methyl-	C8H16	Alkena
7	0,24	1,7 Oktadiene, 2,6-Dimethyl	C10H18	Alkena
8	0,53	Benzene, ethyl-	C8H10	Aromatik
9	0,69	Benzene, 1,2-dimethyl-	C8H10	Aromatik
10	1,77	Cyclopropane, 1-methyl-2-pentyl	C9H18	Siklik - Alkena
11	0,36	Benzene, 1-ethyl-3-methyl-	C9H12	Aromatik
12	1,67	Phenol	C6H16O	Phenol
13	1,28	1-Decene	C10H20	Alkena
14	1,10	Decane	C10H22	Alkana
15	0,22	2-Hexadecene,2,6,10,14-tetramethyl	C20H40	Alkena
16	0,25	Phenol, 2-methyl-	C7H18O	Phenol
17	0,7	Cyclohexane,1-3 Butadienylidene-	C10H14	Siklik - Alkena
18	0,37	phenol,3-methyl-	C7H8O	Phenol
19	0,47	7-Tetradecene	C14H28	Alkena
20	1,31	1-Undecene	C11H22	Alkena
21	0,82	Undecane	C11H24	Alkana

Peak	Area (%)	Nama	Formula	Golongan
22	0,93	Cyclopropane	C12H24	Siklik - Alkena
23	0,48	Nephthalene	C10H8	PAH
24	0,68	Dedocene	C12H26	Alkana
25	0,81	1-Tridecene	C13H26	Alkena
26	0,74	Tridecane	C13H28	Alkana
27	0,38	Naphthalene,2-methyl-	C11H10	PAH
28	0,28	1-Undecene,7-methyl-	C12H24	Alkena
29	0,22	1-Tridecanol	C13H28O	Alkohol
30	0,28	1,11-Dodecediene	C12H22	Alkena
31	1,31	1-Tetradecene	C14H28	Alkena
32	1,07	Heptadecane	C17H36	Alkana
33	0,24	1,12-Tridecadiene	C13H24	Alkena
34	1,51	1-Pentadecene	C15H30	Alkena
35	1,08	2-Tridecanone	C13H26O	Keton
36	1,13	Heptadecane	C17H36	Alkana
37	0,45	1,12- Dodecanediol	C12 H26 O2	Alkohol
38	1,78	1-Hexadecene	C16H32	Alkena
39	1,49	Hexadecane	C16H34	Alkana
40	0,52	1,12-Dodecanediol	C12H26O2	Alkohol
41	1,81	9-Eicosene	C20H40	Alkena
42	1,91	Heptadecane	C17H36	Alkana
43	0,25	7-Hexadecene	C16H32	Alkena
44	0,3	1-Hexadecanol	C16H34O	Alkohol
45	0,33	1,12-Dodecanediol	C12H26O2	Alkohol
46	1,79	9-Eicosene	C20H40	Alkena

Peak	Area (%)	Nama	Formula	Golongan
47	1,45	Octadecane	C18H38	Alkana
48	0,24	5-Eicosene	C20H40	Alkena
49	0,41	1,13-Tetradecadiene	C14H26	Alkena
50	1,76	9-Eicosene	C20H40	Alkena
51	1,58	Nonadecane	C19H40	Alkana
52	2,28	2-Heptadecanone	C17H34O	Keton
53	0,35	1,13-Tetradecadiene	C14H26	Alkena
54	1,79	9-Eicosene	C20H40	Alkena
55	1,83	Tetracosane	C28H58	Alkana
56	0,49	Cyclotridecanone	C13H24O	Keton
57	0,72	9-Octadecen-1-ol	C18H36O	Alkohol
58	1,82	1-Nonadecene	C19H38	Alkena
59	1,63	Eicosana	C20H42	Alkana
60	0,68	2-Nonadecanone	C19H38O	Keton
61	0,45	1-Hentetracontanol	C41H84O	Alkohol
62	0,59	1,14-Tetradecanediol	C14H30O	Alkohol
63	2,03	1-Octadecanol	C18H38O	Alkohol
64	1,90	Nonadecane	C19H40	Alkana
65	0,41	1-Docosanol	C22H46O	Alkohol
66	0,37	1,15-Hexadecadiene	C16H30	Alkena
67	1,71	9-Tricosene	C23H46	Alkena
68	1,59	Eicosana	C20H42	Alkana
69	0,51	1,16-Hexadecanediol	C16H34O2	Alkohol
70	1,83	1-Octadecanol	C18H38O	Alkohol
71	1,66	Eicosana	C20H42	Alkana

Peak	Area (%)	Nama	Formula	Golongan
72	0,30	12-Tricosanone	C23H46O	Keton
73	2,28	1-Octadecanol	C18H38O	Alkohol
74	1,8	Eicosana	C20H42	Alkana
75	2,27	1-Eicosanol	C20H42O	Alkohol
76	1,74	Octadecane	C16H34	Alkana
77	0,28	1-Hentetracontanol	C41H84O	Alkohol
78	2,25	Cyclohexane, [6-Cyclopenthyl-3-(3-Cyclopentyl)hexyl]	C25H46	Siklik - Alkana
79	1,59	Hexadecane	C16H34	Alkana
80	3,71	Tritetracontane	C43H88	Alkana
81	3,65	1-Hentetracontanol	C41H84O	Alkohol
82	3,16	Pentatriacontana	C35H72	Alkana
83	2,47	1-pentacontanol	C50H102O	Alkohol
84	2,24	1-Hentetracontanol	C41H84O	Alkohol
85	1,82	1-pentacontanol	C50H102O	Alkohol
86	0,94	1-Hentetracontanol	C41H84O	Alkohol
87	0,54	1-Heptacosanol	C27H56O	Alkohol
88	0,85	Octadecanoic acid	C53H102O2	Asam
89	0,40	Cyclobuta	C16H28	Alkana

Lampiran 7. Senyawa Penyusun Pyrolytic-oil (GC-MS) Temperatur 425°C

Peak	Area (%)	Nama	Formula	Golongan
1	0,83	1-Hexene	C6H12	Alkena
2	3,12	1-Heptene	C7H14	Alkena
3	1,32	2,4-Heptadien-l-ol	C7H12O	Alkohol
4	2,6	Benzene, methyl-	C7H8	Aromatik
5	1,92	1-Octene	C8H16	Alkena
6	0,30	Cyclopropane	C8H14	Siklik-Alkena
7	0,56	5,7-Dimethyl-1,6-Octadiene	C10H18	Alkana
8	1,08	1-Decene	C11H22	Alkena
9	0,38	3-Octyne	C8H14	Alkuna
10	1,1	Benzene, ethyl-	C8H10	Aromatik
11	1,67	Benzene, 1,4-dimethyl-	C8H10	Aromatik
12	3,39	Benzene, 1,2-dimethyl-	C8H10	Aromatik
13	0,62	Benzene, 1-Ethyl-2-methyl	C9H12	Aromatik
14	1,33	Phenol	C6H16O	Phenol
15	2,36	1-Decene	C10H20	Alkena
16	1,62	Decane	C10H22	Alkana
17	0,45	2-Decene	C10H20	Alkena
18	0,42	1-Dodecene	C12H24	Alkena
19	0,66	1H-Indene	C9H8	PAH
20	0,45	Phenol,3-methyl-	C7H8O	Alkena
21	0,8	Cyclopropane, 1-methyl-2-(3-methylpentyl)-	C10H20	Siklik-Alkana
22	2,28	1-Undecene	C11H22	Alkena
23	1,05	Undecane	C11H24	Alkana

Peak	Area (%)	Nama	Formula	Golongan
24	0,34	2-Undecene	C11H22	Alkena
25	0,31	Phenol, 2,6-dimethyl	C8H10O	Phenol
26	0,3	Benzene, (1-methyl-1-propenyl)-	C10H12	Aromatik
27	0,83	Benzene, (1-methyl-2-cyclopropen-1-yl)-	C10H10	Aromatik
28	1,08	1H-Indene, 3-methyl-	C10H10	PAH
29	2,16	Cyclopropane	C12H24	Siklik-Alkana
30	1,39	Naphthalene	C10H8	PAH
31	1,09	Dodecane	C12H26	Alkana
32	0,29	2-Dodecene	C12H24	Alkena
33	0,92	Cyclohexanecarboxylic acid	C13H22O2	Asam
34	2	1-Tetradecene	C14H28	Alkena
35	1,58	Tridecane	C13H28	Alkana
36	1,01	Naphthalene, 2-methyl-	C11H10	PAH
37	0,38	1-Undecene, 7-methyl-	C12H26	Alkena
38	0,37	3-Tetradecene	C14H28	Alkena
39	0,43	Naphthalene, 2-methyl-	C11H10	PAH
40	0,43	1,12-Dodecanediol	C12H26O2	Alkohol
41	2,18	1-Tetradecene	C14H28	Alkena
42	1,71	Tetradecane	C14H30	Alkana
43	0,32	3-Tetradecene	C14H28	Alkena
44	2,03	1-Pentadecene	C15H30	Alkena
45	1,14	2-Tridecanone	C13H26O	Keton
46	1,6	Hexadecan	C16H34	Alkana
47	0,42	1,9-Tetradecadiene	C14H26	Alkana
48	2,24	9-Octadecene	C18H36	Alkena

Peak	Area (%)	Nama	Formula	Golongan
49	2,01	Hexadecane	C16H34	Alkana
50	0,24	5-Octadecene	C18H36	Alkena
51	0,4	9-Octadecen-1-ol	C18H36O	Alkohol
52	1,88	1-Heptadecene	C17H34	Alkena
53	2,4	Heptadecane	C17H36	Alkana
54	0,34	Cyclododecane, ethyl	C14H28	Siklik - Alkana
55	0,68	9-Octadecen-1-ol	C18h36O	Alkohol
56	2,14	9-Eicosene	C20H40	Alkena
57	2,03	Nonadecane	C19H40	Alkana
58	0,38	Cyclotetradecane	C14H28	Siklik-Alkena
59	0,26	Cyclohexanepropanol	C9H18O	Alkohol
60	1,38	9-Eicosene	C20H40	Alkena
61	2	Eicosane	C20H24	Alkana
62	1,68	2-Heptadecanone	C17H34O	Keton
63	1,28	9-Tricosene	C23H46	Alkena
64	1,96	Eicosane	C20H42	Alkana
65	0,33	13-Oxabicyclo[10.1.0]tridecane	C12H22O	Siklik-Alkana
66	1,08	1-Octadecanol	C18H38O	Alkohol
67	1,58	Eicosane	C20H42	Alkana
68	0,46	2-Pentadecanone	C15H30O	Alkana
69	0,77	1-Octadecanol	C18H38O	Alkohol
70	1,37	Eicosane	C20H42	Alkana
71	0,66	1-Octadecanol	C18H38O	Alkohol

Peak	Area (%)	Nama	Formula	Golongan
72	1,21	Eicosane	C20H24	Alkana
73	0,55	1-Octadecanol	C18H38O	Alkana
74	0,91	Eicosana	C20H42	Alkana
75	0,53	1-Eicosanol	C20H42O	Alkohol
76	0,83	Eicosane	C20H42	Alkana
77	0,54	o-Menthone	C10H18O	Keton
78	0,92	Eicosane	C20H42	Alkana
79	0,44	Cyclopentane	C25H46	Siklik-Alkana
80	0,77	Eicosane	C20H42	Alkana
81	1,41	Tritetracontane	C43H88	Alkana
82	1,15	Pentatriacontane	C35H72	Alkana
83	1,23	Pentatriacontane	C35H72	Alkana
84	1,09	Pentatriacontane	C35H72	Alkana
85	0,56	Cyclobuta[1,23,4]dicyclooctene, hexadecahydro-, (6a.alpha.,6b.alpha.,12a.alpha.,12b.alpha.)-	C16H28	Siklik-Alkana
86	0,92	Pentatriacontane	C35H72	Alkana
87	0,68	Dotriacontane	C32H72	Alkana
88	0,83	Pentatriacontane	C35H72	Alkana
89	0,67	Pentatriacontane	C35H73	Alkana
90	0,62	Tritriacontane	C33H68	Alkana

Lampiran 8. Senyawa Penyusun Pyrolytic-oil (GC-MS) Temperatur 450°C

Peak	Area (%)	Nama	Formula	Golongan
1	0,36	-Pentanol, 3-methyl-	C6H14	Alkohol
2	2,18	1-Heptene	C7H14	Alkena
3	1,14	1-Cyclohexene-1-methanol	C7H12O	Alkohol
4	2,19	Benzene, methyl-	C7H8	Aromatik
5	2,1	1-Octene	C8H16	Alkena
6	0,44	Cyclopropane	C8H14	Siklik-Alkena
7	0,9	Cyclohexane, propyl-	C9H18	Siklik-alkena
8	1,59	2-Decene, 8-methyl-	C11H22	Alkena
9	0,57	3,4-Octadiene, 7-methyl	C8H14	Alkena
10	1,51	Cyclopentane, 1-butyl-2-ethyl	C11H22	Siklik-alkena
11	2,11	Benzene, 1,3-dimethyl-	C8H10	Aromatik
12	4,09	Nonane	C9H20	Alkana
13	0,5	10-Undecenal	C11H20	Aldehid
14	0,59	4,5-Nonadiene	C9H16	Alkena
15	1,14	Cyclopentane, 1-hexyl-3-methyl-	C12H24	Siklik-Alkana
16	0,49	Benzene, propyl-	C9H12	Aromatik
17	1	Benzene, 1-ethyl-3-methyl-	C9H12	Aromatik
18	1,66	Phenol	C6H6O	Phenol
19	2,87	1-Decene	C10H20	Alkena
20	2,76	Decane	C10H22	Alkana
21	0,39	1-Heptanol, 2-propyl-	C10H22O	Alkohol
22	0,4	5-CYCLONONEN-1-OL	C9H16O	Alkohol
23	0,35	Benzene, 1,2,4-trimethyl-	C9H12	Aromatik
24	0,79	Benzene, 1-propenyl-	C9H10	Aromatik
25	0,54	Phenol, 2-dimethyl	C7H8O	Phenol

Peak	Area (%)	Nama	Formula	Golongan
26	0,82	1H-Indene	C9H8	PAH
27	0,92	Naphthalene	C10H14	PAH
28	0,64	Phenol, 3-methyl-	C7H8O	Phenol
29	0,99	1-Tridecene	C13H26	Alkena
30	2,48	1-Undecene	C11H22	Alkena
31	0,44	Benzene, 1-butenyl-	C10H12	Aromatik
32	1,51	Undecane	C11H24	Alkana
33	0,41	2-Undecene	C11H22	Alkena
34	0,4	Benzene, 2-ethenyl-1,4-dimethyl-	C10H12	Aromatik
35	0,88	Benzene, (1-methyl-2-cyclopropen-1-yl)-	C10H10	Aromatik
36	0,68	Benzene, (1-methyl-2-cyclopropen-1-yl)-	C10H10	Aromatik
37	0,37	1,11-Dodecadiene	C12H22	Alkena
38	1,99	Cyclopropane	C12H24	Siklik-Alkana
39	1,4	Naphthalene	C10H8	PAH
40	1,43	Dodecane	C12H26	Alkana
41	0,43	2-Dodecene	C12H24	Alkena
42	2,34	1-Tridecene	C13H28	Alkena
43	1,66	Tridecane	C13H28	Alkana
44	0,96	Naphthalene, 2-methyl-	C11H10	PAH
45	0,45	1-Undecene, 7-methyl-	C12H24	Alkena
46	0,37	Naphthalene, 1-methyl-	C11H10	PAH
47	0,34	3-Hexadecene	C16H32	Alkena
48	1,58	1-Tetradecene	C14H28	Alkena
49	1,34	Tetradecane	C14H30	Alkana

Peak	Area (%)	Nama	Formula	Golongan
50	1,54	1-Pentadecene	C15H30	Alkena
51	1,38	2-Tridecanone	C13H26O	Keton
52	1,3	Heptadecane	C17H36	Alkana
53	1,57	9-Octadecene	C18H36	Alkena
54	1,53	Hexadecane	C16H34	Alkana
55	1,29	1-Heptadecene	C17H34	Alkena
56	1,87	Heptadecane, 2,6,10,15-tetramethyl-	C21H44	Alkana
57	1,28	1-Heptadecene	C17H34	Alkena
58	1,24	Octadecane	C18H38	Alkana
59	1,02	Octadecane	C20H40	Alkena
60	1,25	Eicosane	C20H24	Alkana
61	1,55	2-Heptadecanone	C17H34O	Keton
62	0,93	9-Tricosene	C23H46	Alkena
63	1,17	Eicosane	C20H42	Alkana
64	0,45	9-Octadecen-1-ol	C18H36O	Alkohol
65	1	1-Octadecanol	C18H38O	Alkohol
66	1,15	Eicosane	C20H42	Alkana
67	0,45	2-HEXADECANONE	C16H32O	Keton
68	0,71	1-Docosanol	C22H46O	Alkohol
69	0,85	Eicosane	C20H42	Alkana
70	0,71	9-Tricosene	C23H46	Alkena
71	0,8	Nonacosane	C29H60	Alkena
72	0,67	1-Octadecanol	C18H38O	Alkohol
73	0,94	Nonacosane	C29H60	Alkena
74	0,41	12-Tricosanone	C23H46O	Keton

Peak	Area (%)	Nama	Formula	Golongan
75	0,72	1-Eicosanol	C20H42O	Alkohol
76	1,02	Nonadecane	C19H40	Alkana
77	0,68	1-Eicosanol	C20H42O	Alkohol
78	1,06	Nonacosane	C29H60	Alkana
79	0,73	1-Eicosanol	C20H42O	Alkohol
80	1,02	Eicosane	C20H42	Alkana
81	1,49	Tetratetracontane	C44H90	Alkana
82	1,49	Pentatriacontane	C35H72	Alkana
83	1,65	Pentatriacontane	C35H72	Alkana
84	1,04	Tritetracontane	C43H88	Alkana
85	1,34	Pentatriacontane	C35H72	Alkana
86	0,82	Pentatriacontane	C35H72	Alkana
87	0,7	Pentatriacontane	C35H72	Alkana
88	0,38	Cyclotrisiloxane, hexamethyl-	C6 H18 O3 SI3	Siklik-Alkana
89	0,8	Pentatriacontane	C35H72	Alkana
90	0,52	Octadecane, 1,1'-[1,3-propanediylbis(oxy)]bis	C39H80O2	Keton

Lampiran 9. Senyawa Penyusun Pyrolytic-oil (GC-MS) Temperatur 475°C

Peak	Area (%)	Nama	Formula	Golongan
1	0,33	1-Heptene	C7H14	Alkena
2	0,21	Cyclohexane, methyl-	C7H14	Siklik-Alkana
3	0,67	1,3,5-Cycloheptatriene	C7H8	Siklik-Alkana
4	0,51	Cyclopropane, (2-methylenebutyl)-	C8H14	Siklik-Alkena
5	0,88	4-Decene, 8-methyl-,	C11H22	Alkena
6	0,46	1-Nonyne	C9H16	Alkuna
7	1,28	1-Nonene	C9H18	Alkena
8	0,18	1,11-Dodecadiene	C12H22	Alkena
9	1,35	1-Decene	C10H20	Alkena
10	0,68	Decane	C9H22	Alkana
11	0,58	3-Tetradecene	C14H28	Alkena
12	1,51	1-Undecene	C11H22	Alkena
13	0,84	Undecane	C11H24	Alkana
14	0,22	1,11-Dodecadiene	C12H22	Alkena
15	1,56	Cyclopropane, nonyl-	C12H24	Siklik-Alkana
16	0,94	Dodecane	C12H26	Alkana
17	0,35	1,11-Dodecadiene	C12H22	Alkena
18	1,75	1-Tridecene	C13H26	Alkena
19	1,16	Tridecane	C13H28	Alkana
20	0,68	1-Undecene, 7-methyl-	C12H24	Alkena
21	0,18	3-Hexadecene,	C16H32	Alkena

Peak	Area (%)	Nama	Formula	Golongan
22	0,37	1-Undecene, 7-methyl-	C12H24	Alkena
23	0,4	1,11-Dodecadiene	C12H22	Alkena
24	2,39	1-Tetradecene	C14H28	Alkena
25	1,35	Hexadecane	C16H34	Alkana
26	0,34	1,12-Tridecadiene	C13H24	Alkena
27	2,45	1-Pentadecene	C15H30	Alkena
28	0,28	1,12-Tridecadiene	C13H24	Alkena
29	1,64	Hexadecane	C16H34	Alkana
30	0,21	1-Tridecanol	C13H28O	Alkohol
31	0,21	1-Pentadecanol	C15H32O	Alkohol
32	0,41	1-Hexadecanol	C20H42O	Alkohol
33	0,52	1,12-Dodecanediol	C12H26O2	Alkohol
34	2,57	9-Octadecene	C18H36	Alkena
35	2,1	Eicosane	C20H42	Alkana
36	0,24	1-Dodecyne	C12H22	Alkuna
37	0,69	1,14-Tetradecanediol	C14H30O2	Alkohol
38	2,81	1-Heptadecene	C17H34	Alkena
39	2,46	Heptadecane	C17H36	Alkana
40	0,24	Cyclotetradecan	C14H28	Siklik-Alkena
41	0,17	1-Nonadecene	C19H38	Alkena
42	0,27	1-Tridecanol	C13H28O	Alkohol
43	0,17	1-Heptacosanol	C27H56O	Alkohol
44	0,76	1,10-Decanediol	C10H22O2	Alkohol
45	2,9	9-Eicosene	C20H40	Alkena
46	2,64	Nonadecane	C19H40	Alkana

Peak	Area (%)	Nama	Formula	Golongan
47	0,35	5-Eicosene	C20H40	Alkena
48	0,38	Cyclohexane, 1,1'-(1,2-dimethyl-1,2-ethanediyl)bis-	C16H30	Siklik-Alkana
49	0,64	9-Octadecen-1-ol	C18H36O	Alkohol
50	3	9-Eicosene	C20H40	Alkena
51	3,19	Nonadecane	C19H40	Alkana
52	1,39	Cyclopentylacetone	C8H14O	Keton
53	0,18	1-Tricosanol	C23H48O	Alkohol
54	0,26	1-Hexadecanol	C20H42O	Alkohol
55	0,21	Dodecane 3-cyclohexyl-, 3-cyclohexyl-	C18H36	Siklik-Alkana
56	0,22	tetra propylene	C12H24	Alkena
57	0,57	1,12-Dodecanediol	C12H26O2	Alkohol
58	3,05	9-Eicosene	C20H40	Alkena
59	3,54	Eicosana	C20H42	Alkana
60	0,28	5-Eicosene	C20H42	Alkena
61	0,25	1-Nonadecene	C19H38	Alkena
62	0,35	CYCLOHEXAN, 2,4-DIISOPROPYL-1,1-DIMETHYL-	C14H28	Siklik-Alkana
63	0,24	Octadecanal	C18H36O	Alkohol
64	0,39	9-Octadecen-1-ol	C18H36O	Alkohol
65	0,82	9-Octadecen-1-ol	C18H36O	Alkohol
66	2,87	1-Octadecene	C18H36	Alkena
67	3,34	Eicosana	C20H42	Alkana
68	0,83	11-Dodecen-2-one	C12H22O	Keton
69	0,47	1-Docosanol	C22H46O	Alkohol

Peak	Area (%)	Nama	Formula	Golongan
70	0,32	1-Hexadecanol, 3,7,11,15-tetramethyl-	C20H43O	Alkohol
71	0,78	1,13-Tetradecadien	C14H26	Alkena
72	2,61	9-Tricosene	C23H46	Alkena
73	3,58	Eicosana	C20H42	Alkana
74	0,35	9-Octadecen-1-ol	C18H36O	Alkohol
75	0,22	1-Docosanol	C22H46O	Alkohol
76	0,29	Cyclododecanol	C12H24O	Alkohol
77	1,96	1-Octadecanol	C18H38O	Alkohol
78	3,16	Eicosana	C20H42	Alkana
79	0,36	Octadecanal	C18H36O	Alkohol
80	1,6	1-Octadecanol	C18H38O	Alkohol
81	2,58	Eicosana	C20H42	Alkana
82	0,19	1-Docosanol	C22H46O	Alkohol
83	1,37	1-Octadecanol	C18H38O	Alkohol
84	2,22	Eicosana	C20H42	Alkana
85	0,17	1-Octadecanol	C18H38O	Alkohol
86	2,55	Tetratetracontane	C44H90	Alkana
87	1,66	Tetratetracontane	C44H90	Alkana
88	1,2	Tetratetracontane	C44H90	Alkana
89	0,71	Tetratetracontane	C44H90	Alkana
90	0,42	Tetratetracontane	C44H90	Alkana

Lampiran 10. Senyawa Penyusun Pyrolytic-oil (GC-MS) Temperatur 500°C

Peak	Area (%)	Nama	Formula	Golongan
1	0,28	1-Hexene	C6 H12	Alkena
2	0,25	2,4-Hexadien-1-ol	C6 H10 O	Alkohol
3	1,7	Benzene	C6 H6	Aromatik
4	0,19	Furan, 2,5-dihydro-2,5-dimethyl-	C6 H10 O	Furan
5	0,47	1-Cyclohexene-1-methanol	C7 H12 O	Alkohol
6	0,34	CYCLOPROPENE, 3,3-DIETHYL-	C7 H12	Siklik-Alkena
7	2,33	Benzene, methyl-	C7 H8	Aromatik
8	0,77	1-Octene	C8 H16	Alkena
9	0,87	1-Heptanol, 2-propyl-	C10 H22 O	Alkohol
10	0,39	Cyclopropane, (2,2-dimethylpropylidene)-	C8 H14	Siklik-Alkana
11	0,45	Cyclohexane, propyl-	C19 H18	Siklik-Alkana
12	1,11	5-Undecene, 3-methyl-, (E)-	C12 H24	Alkena
13	0,48	HEXYLIDENE-CYCLOPROPANE	C9 H16	Alkena
14	0,38	3-Decyn-2-ol	C10 H18 O	Alkohol
15	0,78	Benzene, ethyl-	C8 H10	Aromatik
16	1,55	Benzene, 1,3-dimethyl-	C8 H10	Aromatik
17	1,34	1-Nonene	C9 H18	Alkena
18	1,14	Nonane	C9 H20	Alkana
19	1,39	Benzene, 1,2-dimethyl-	C8 H10	Aromatik
20	0,42	TRANS NONENE-3	C9 H18	Alkena
21	0,34	Cyclooctene, 4-ethenyl-	C10H16	Siklik-Alkena
22	0,19	3-Decen-1-ol, (E)-	C10 H20 O	Alkohol
23	0,22	Decanal	C10 H20 O	Aldehid
24	0,29	Benzene, propyl-	C9 H12	Aromatik
25	0,73	Benzene, 1-ethyl-2-methyl-	C9 H12	Aromatik
26	2,67	Phenol	C6 H6 O	Phenol
27	2,48	1-Decene	C10 H20	Alkena
28	0,91	Decane	C10 H22	Alkana
29	0,9	Benzene, 1,3,5-trimethyl-	C9 H12	Aromatik
30	0,24	Octane, 2,3,6,7-tetramethyl-	C12H26	Alkana
31	0,2	1-Decene	C10 H20	Alkena
32	0,4	1H-Indene, 2,3-dihydro-	C9 H10	PAH

Peak	Area (%)	Nama	Formula	Golongan
33	0,93	1H-Indene	C9 H8	PAH
34	0,3	1,5,8-p-menthatriene	C10H14	Alkena
35	0,53	Benzeneacetic acid, .alpha.-hydroxy-	C8 H8 O3	Asam
36	0,5	1-Octanol, 3,7-dimethyl-	C10 H22 O	Alkohol
37	2,23	1-Undecene	C11 H22	Alkena
38	0,41	Benzene, methyl(1-methylethyl)-	C10H14	Aromatik
39	1,32	Undecane	C11 H24	Alkana
40	0,49	2-Undecene, (Z)-	C11 H22	Alkena
41	0,2	2-Undecene, (Z)-	C11 H22	Alkena
42	0,22	4,7-Methano-1H-indene-1,8-dione, 3a,4,7,7a-tetrahydro-	C10 H8 O2	Keton
43	0,36	3,7-Dimethyl-1,6-Octadiene	C10H18	Alkena
44	0,66	Benzene, (1-methyl-2-cyclopropen-1-yl)	C10 H10	Aromatik
45	0,57	1H-Indene, 3-methyl-	C10 H10	PAH
46	0,33	1,11-Dodecadiene	C12 H22	Alkena
47	2,12	1-Dodecene	C12 H24	Alkena
48	0,3	2-METHYL-10-UNDECENAL	C12 H22 O	Aldehid
49	1,19	Dodecane	C12 H26	Alkana
50	1,89	Naphthalene	C10 H8	PAH
51	0,3	1-Dodecene	C12 H24	Alkena
52	0,73			
53	0,56	Cyclododecane	C12 H24	Siklik-Alkana
54	0,35	Dotriacontane	C32 H66	Alkana
55	0,27	1-METHYL-BUTA-1,3-DIENYL)-BENZENE	C11 H12	Aromatik
56	0,47	Benzene, (3-cyclopentylpropyl)-	C14H20	Aromatik
57	0,88	Cyclopentane, 1,1,3,4-tetramethyl-, trans-	C9 H18	Siklik-Alkana
58	1,01	8-dodecenol	C12 H24 O	Alkohol
59	2,57	1-Tridecene	C13 H26	Alkena
60	1,85	Tridecane	C13 H28	Alkana
61	0,48	6-Tridecene	C13 H26	Alkena
62	0,59	1-Tridecanol	C13 H28 O	Alkohol
63	1,15	Naphthalene, 1-methyl-	C11 H10	PAH
64	0,5	1-Undecene, 7-methyl-	C12 H24	Alkena

Peak	Area (%)	Nama	Formula	Golongan
65	0,59	1,4-Methanonaphthalene, 1,4-dihydro-	C11 H10	PAH
66	0,21	Cyclododecene	C13H24	Siklik-Alkena
67	0,37	Tridecanol	C13H28O	Alkohol
68	0,35	Benzene, (2-decyldodecyl)-	C28H50	Aromatik
69	0,42	1,11-Dodecadiene	C12H22	Alkena
70	2,69	1-Tetradecene	C14H28	Alkena
71	1,69	Tetradecane	C14H30	Alkana
72	0,30	5-Tetradecene	C14H28	Alkena
73	0,42	1-Dodecene	C12H24	Alkena
74	0,24	Naphthalene, 1,5-dimethyl-	C12H12	PAH
75	0,33	Naphthalene, 1,3-dimethyl-	C12H12	PAH
76	0,24	Naphthalene, 2,7-dimethyl-	C12H12	PAH
77	0,32	Undecane 5-cyclohexyl	C17H34	Siklik-Alkana
78	0,40	Naphthalene, 1,6-dimethyl-	C12H12	PAH
79	0,33			
80	0,39	8,9-Dimethylbicyclo[4.4.1]undeca-2,4,8-triene	C13H18	Alkena
81	1,02	1,12-Tridecadiene	C13H24	Alkena
82	2,49	1-Pentadecene	C15H30	Alkena
83	2,32	Pentadecane	C15H32	Alkana
84	0,44	1-Pentadecene	C15H30	Alkena
85	0,42	1-Pentadecene	C15H30	Alkena
86	0,24	Tridecanol	C13H28O	Alkohol
87	0,50	1,9-Tetradecadiene	C14H26	Alkena
88	1,79	1-Hexadecene	C16H32	Alkena
89	1,41	Hexadecane	C16H34	Alkana
90	0,19	7-Hexadecene	C16H32	Alkena
91	0,49	1,15-Hexadecadiene	C16H30	Alkena
92	1,48	1-Heptadecene	C17H34	Alkena
93	1,27	Nonadecane	C19H40	Alkana
94	0,39	1-Nonadecene	C19H38	Alkena
95	0,41	Tridecanol	C13H28O	Alkohol
96	0,25	2,5-Furandione, 3-(dodecenyl)dihydro-	C16H26O3	Keton

Peak	Area (%)	Nama	Formula	Golongan
97	0,28	Acetic Acid	C22H44O2	Asam
98	0,58	1,15-Hexadecadiene	C16H30	Alkena
99	1,11	1-Octadecanol	C18H38O	Alkohol
100	1,00	Octadecane	C18H38	Alkana
101	0,30	3-Octadecene	C18H36	Alkena
102	0,21	Cyclododecene	C12H22	Siklik-Alkena
103	0,81	1-Octadecanol	C18H38O	Alkohol
104	0,73	Nonadecane	C19H40	Alkana
105	0,96	2-Heptadecanone	C17H34O	Keton
106	0,20	Hexadecanoic Acid	C16H32O2	Asam
107	0,65	1-Octadecanol	C18H38O	Alkohol
108	0,78	Eicosane	C20H42	Alkana
109	0,26	9-Octadecen-1-ol	C18H36O	Alkohol
110	0,63	9-Tricosene	C23H46	Alkena
111	0,56	Eicosane	C20H42	Alkana
112	0,28	2-Pentadecanone	C15H30O	Keton
113	0,36	1-Octadecene	C18H36	Alkena
114	0,40	Eicosane	C20H42	Alkana
115	0,54	1-Eicosanol	C20H42O	Alkohol
116	0,42	Hexadecane	C16H34	Alkana
117	0,50	Menthone	C10H18O	Keton
118	0,29	Hexadecane, 2,6,10,14-tetramethyl-	C20H42	Alkana
119	0,44	Cyclohexane	C16H30	Siklik-Alkana
120	0,35	Eicosane	C20H42	Alkana
121	0,41	Cyclopentane	C22H44	Siklik-Alkana
122	0,30	Hexadecane, 2,6,10,14-tetramethyl-	C20H42	Alkana
123	0,88	Pentatriacontane	C35H72	Alkana
124	0,79	Pentatriacontane	C35H72	Alkana
125	0,87	Pentatriacontane	C35H72	Alkana
126	0,32	Pregna-1,4dien-3-one	C24H34O5	Keton
127	0,36	2,10,10-trimethyl-6-methylidene-1-oxaspiro[4,5]dec-7-yl isopropyl ether	C16H28O2	Asam
128	0,83	Pentatriacontane	C35H72	Alkana

Peak	Area (%)	Nama	Formula	Golongan
129	0,18	Chola-5,22-dien-3-ol	C24H38O	Alkohol
130	0,30	8,11,14-Eicosatrienoic Acid	C20H34O	Asam
131	1,02	Pentatriacontane	C35H72	Alkana
132	0,59	5-(2-hydroxyphenyl)-5-methyltetrahydrofuran-2-ol	C11H14O3	Alkohol
133	0,31	4-decenoate	C12H22O2	Asam
134	0,87	Cyclobuta[1,2,3,4]dicyclooctene	C16H28	Siklik-Alkena
135	1,07	1-Henetetracontanol	C41H84O	Alkohol
136	0,56	Pentatriacontane	C35H72	Alkana
137	0,33	Nonahexacontanoic Acid	C69H138O2	Asam
138	0,33	Nonadecane, 2,3-dimethyl	C21H44	Alkana
139	0,20	Octadecanoid Acid	C18H36O2	Asam