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APPENDIX A

A Operating Temperature

Table A1 Temperature profiles of pyrolysis without a catalyst

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.9	25.7	32	379.1	523.2	62	303.2	500.5	92	301.3	502.6
4	53.4	37.7	34	370.2	502.7	64	306.7	500.4	94	311.5	503.6
6	96.0	69.3	36	363.8	505.4	66	301.5	504.2	96	313.1	496.0
8	112.2	82.2	38	354.0	501.9	68	297.4	494.0	98	314.5	505.4
10	162.2	127.7	40	340.5	485.0	70	305.9	504.3	100	314.2	499.6
12	214.7	179.4	42	336.8	470.4	72	305.8	498.1	102	314.8	502.7
14	250.8	220.6	44	334.9	452.5	74	310.7	506.0	104	315.1	494.1
16	301.4	284.8	46	323.6	441.3	76	307.7	498.9	106	314.3	499.9
18	317.7	374.6	48	320.5	452.5	78	306.5	505.0	108	304.8	494.8
20	322.5	402.0	50	316.9	441.3	80	301.0	501.0	110	301.7	504.9
22	345.5	379.2	52	317.2	452.3	82	303.5	492.0	112	298.4	497.5
24	347.2	480.6	54	309.4	497.4	84	305.7	502.2	114	308.9	501.6
26	363.7	492.2	56	303.7	505.7	86	300.5	499.8	116	309.7	495.3
28	376.5	488.1	58	303.4	498.4	88	296.6	494.2	118	312.7	505.8
30	376.9	518.9	60	300.0	493.0	90	299.4	503.3	120	312.9	502.2

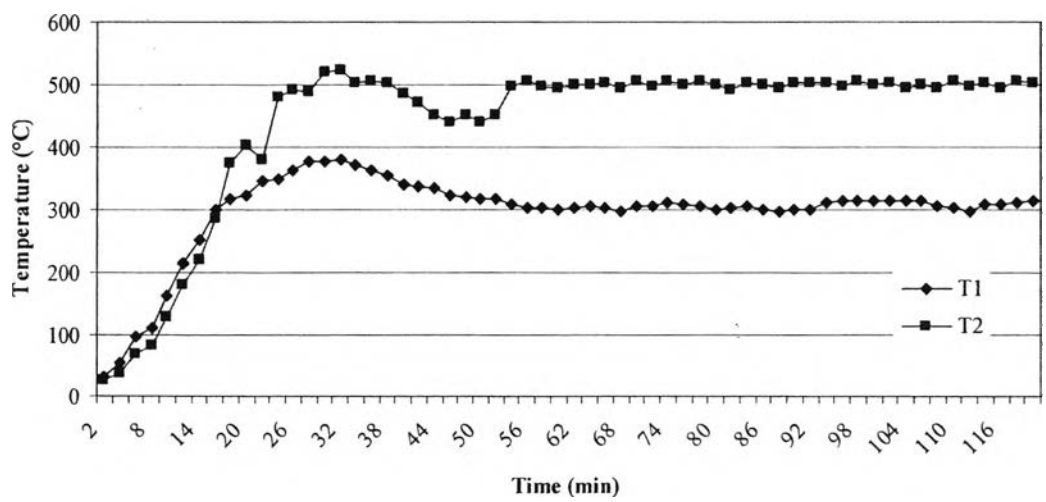

Figure A1 Temperature profiles of pyrolysis without a catalyst.

Table A2 Temperature profiles of pyrolysis with Y-zeolite

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.3	23.9	32	340.0	494.9	62	316.2	505.6	92	308.8	506.6
4	31.9	28.6	34	344.2	502.9	64	314.2	499.5	94	308.0	499.3
6	44.1	41.7	36	345.7	500.4	66	312.6	502.8	96	306.0	506.4
8	59.1	59.9	38	341.9	500.7	68	312.0	503.1	98	304.3	496.6
10	82.8	92.1	40	343.9	494.4	70	310.4	501.2	100	298.8	506.6
12	111.1	127.5	42	342.6	505.4	72	309.0	505.2	102	299.1	499.0
14	149.3	175.7	44	341.7	504.3	74	307.2	496.4	104	310.3	501.3
16	200.1	239.5	46	339.2	505.1	76	305.4	506.0	106	313.9	496.7
18	234.7	299.9	48	337.5	500.3	78	303.0	497.8	108	314.3	505.6
20	310.5	399.9	50	334.9	491.9	80	300.0	505.2	110	317.0	500.3
22	332.4	487.0	52	331.0	489.3	82	299.4	493.9	112	315.5	501.3
24	337.0	517.3	54	327.8	504.8	84	306.4	504.4	114	312.5	505.5
26	344.5	508.3	56	324.8	498.2	86	309.6	502.9	116	309.7	499.4
28	338.4	497.3	58	322.3	504.8	88	310.4	505.1	118	307.2	504.1
30	339.4	503.7	60	319.6	494.0	90	310.0	496.0	120	305.0	495.9

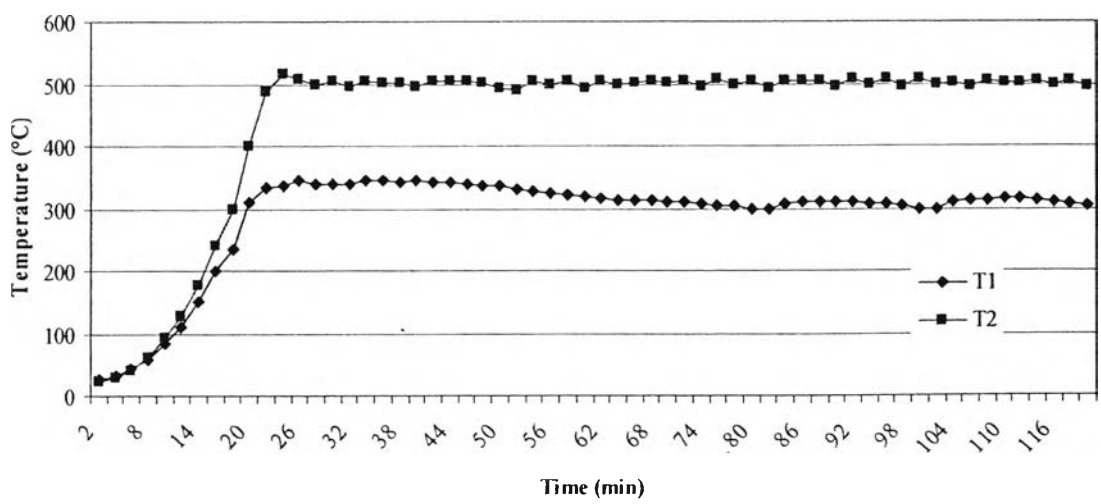

Figure A2 Temperature profiles of pyrolysis with Y zeolite.

Table A3 Temperature profiles of pyrolysis with Pd/Y catalyst

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	27.8	24.1	32	340.9	505.7	62	309.0	496.5	92	303.8	503.8
4	36.4	32.0	34	338.2	498.8	64	310.1	503.3	94	301.2	498.1
6	50.3	46.6	36	336.2	501.0	66	309.5	497.7	96	296.6	504.1
8	72.8	72.8	38	333.6	488.0	68	308.1	498.8	98	300.2	497.2
10	98.6	105.5	40	330.2	495.7	70	305.4	503.2	100	310.8	503.9
12	132.6	147.8	42	326.5	501.7	72	302.9	505.5	102	307.2	502.0
14	169.2	195.1	44	322.6	503.8	74	299.9	498.4	104	304.1	501.7
16	210.1	250.3	46	318.4	488.1	76	301.1	502.0	106	301.9	497.7
18	258.8	324.6	48	314.6	489.7	78	306.8	502.8	108	298.5	504.6
20	323.3	414.6	50	311.5	504.3	80	306.1	493.9	110	302.2	499.6
22	332.3	480.6	52	307.8	499.6	82	304.0	502.7	112	311.2	500.3
24	346.0	509.9	54	302.8	498.1	84	300.0	499.9	114	309.0	493.3
26	341.6	501.2	56	300.0	503.4	86	299.6	501.4	116	305.1	503.3
28	342.6	504.7	58	299.7	498.5	88	306.8	493.0	118	302.9	501.9
30	344.6	494.6	60	307.3	507.6	90	307.9	502.1	120	299.1	497.6

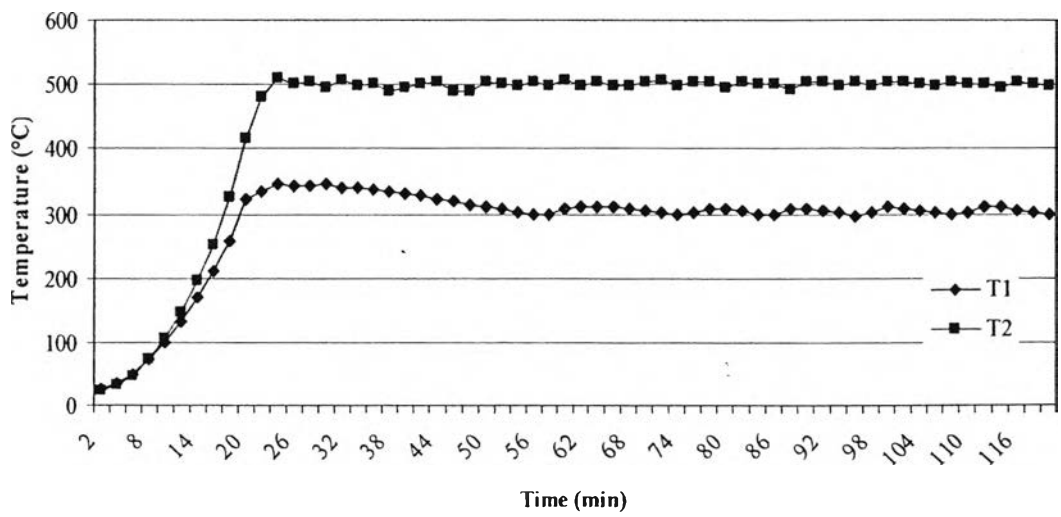

Figure A3 Temperature profiles of pyrolysis with Pd/Y zeolite.

Table A4 Temperature profiles of pyrolysis with Pt/Y-zeolite

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	29.8	29.4	32	344.3	499.1	62	316.7	499.7	92	305.4	500.9
4	39.9	44.7	34	342.3	503.0	64	319.6	504.5	94	302.0	497.2
6	62.2	78.3	36	338.8	496.3	66	319.3	492.5	96	299.3	505.1
8	81.2	107.1	38	336.5	497.1	68	317.8	504.5	98	297.2	496.9
10	106.6	148.9	40	332.4	505.8	70	312.6	503.5	100	305.9	502.5
12	139.9	201.7	42	328.3	499.3	72	310.5	496.4	102	311.2	501.7
14	180.0	260.8	44	323.8	497.2	74	306.8	507.1	104	312.0	499.4
16	227.6	329.6	46	319.3	505.0	76	303.6	501.8	106	310.0	502.0
18	290.3	411.4	48	314.5	497.1	78	297.1	506.1	108	307.2	494.4
20	328.7	440.4	50	310.1	502.6	80	295	492.2	110	303.9	506.2
22	351.9	489.0	52	305.7	499.8	82	302.5	506.3	112	299.1	501.3
24	353.4	505.8	54	300.9	501.3	84	312.5	505.0	114	296.6	503.2
26	353.6	503.7	56	299.6	502.0	86	313.3	504.2	116	295.2	492.4
28	344.3	493.6	58	306.6	496.6	88	312.4	492.7	118	306.6	501.9
30	344.3	502.3	60	310.5	495.8	90	309.6	506.5	120	313.0	501.1

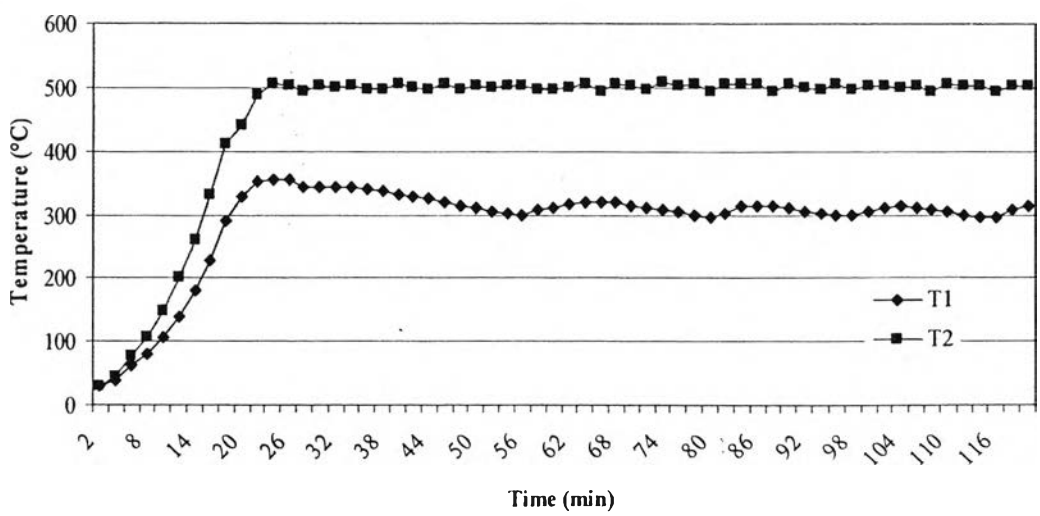

Figure A4 Temperature profiles of pyrolysis with Pt/Y zeolite.

Table A5 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.8)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	33.7	27.4	32	301.2	499.3	62	309	493.3	92	308.7	505.8
4	48.7	39.6	34	303.0	504.8	64	307.5	501.1	94	305.6	498.0
6	81.5	69.1	36	310.6	494.5	66	304.2	500.8	96	303.8	504.1
8	96.4	99.7	38	308.8	488.5	68	301.6	502.3	98	300.1	503.2
10	111.2	122.1	40	304.5	499.9	70	298.9	497.0	100	298.5	503.2
12	184.4	190.2	42	301.6	497.4	72	296.9	508.3	102	307.0	502.3
14	234.2	246.1	44	295.5	495.3	74	308.9	497.5	104	308.7	491.6
16	291.8	322.7	46	309.7	509.4	76	311.5	505.5	106	304.4	503.2
18	316.4	384.6	48	311.4	502.2	78	309.1	496.3	108	301.4	502.3
20	310.6	418.1	50	309.6	498.5	80	306.4	499.8	110	305.7	499.5
22	312.5	466.0	52	304.1	499.8	82	302.9	501.4	112	305.8	506.0
24	310.6	485.4	54	301.9	505.0	84	300.8	502.5	114	302.6	497.7
26	308.7	498.5	56	299.7	501.3	86	299.8	494.8	116	299.0	503.4
28	304.2	497.6	58	307.0	507.1	88	310.7	503.3	118	297.2	494.0
30	302.6	501.5	60	310.6	495.5	90	313.6	502.1	120	307.5	508.1

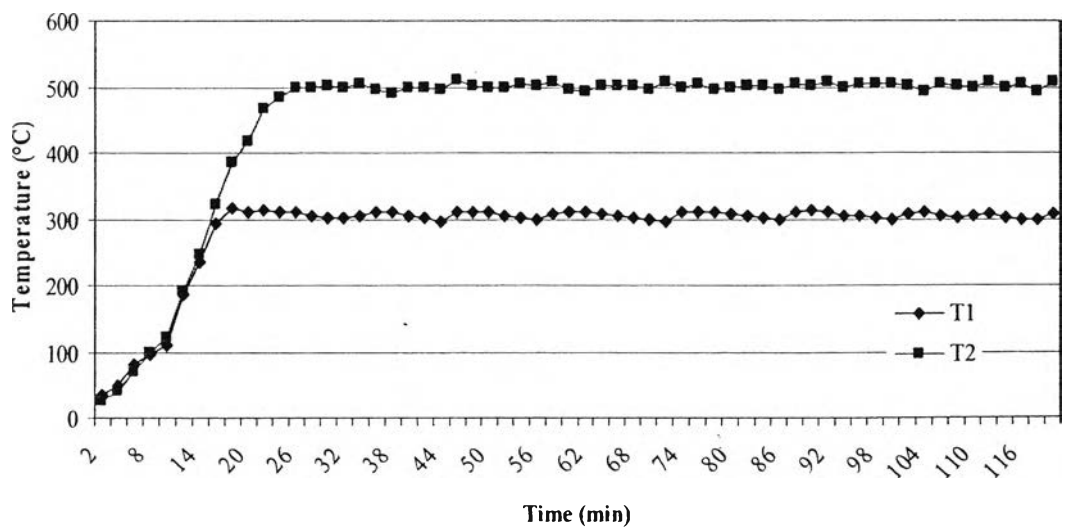

Figure A5 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.8).

Table A6 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.6)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	29.4	31.4	32	336.4	509.3	62	299.3	499.7	92	300.5	506.7
4	41.8	54.0	34	334.8	508.7	64	309.2	504.5	94	307.1	499.1
6	56.9	79.2	36	333.2	500.3	66	311.9	495.0	96	305.1	506.5
8	82.4	120.3	38	328.6	505.4	68	312.1	504.7	98	300.0	498.6
10	125.6	17.7	40	322.4	498.1	70	313.2	502.7	100	299.0	505.2
12	148.1	222.7	42	317.7	506.4	72	313.6	500.3	102	308.5	496.9
14	188.9	283.2	44	312.5	498.1	74	311.4	504.1	104	311.7	507.9
16	229.2	339.3	46	307.7	507.6	76	306.9	495.2	106	310.0	499.4
18	290.4	424.9	48	300.9	496.0	78	300.7	505.8	108	304.9	505.6
20	325.4	450.2	50	297.2	505.9	80	299.9	497.6	110	300.8	500.5
22	334.5	490.5	52	305.0	502.0	82	306.3	505.6	112	297.1	499.2
24	338.4	509.3	54	307.4	503.9	84	309.2	499.9	114	306.7	503.7
26	340.2	497.9	56	305.7	502.7	86	307.2	493.9	116	307.7	496.7
28	338.8	502.7	58	300.7	494.5	88	302.9	508.1	118	303.5	503.4
30	338.1	491.3	60	296.7	505.5	90	298.0	501.2	120	299.4	499.6

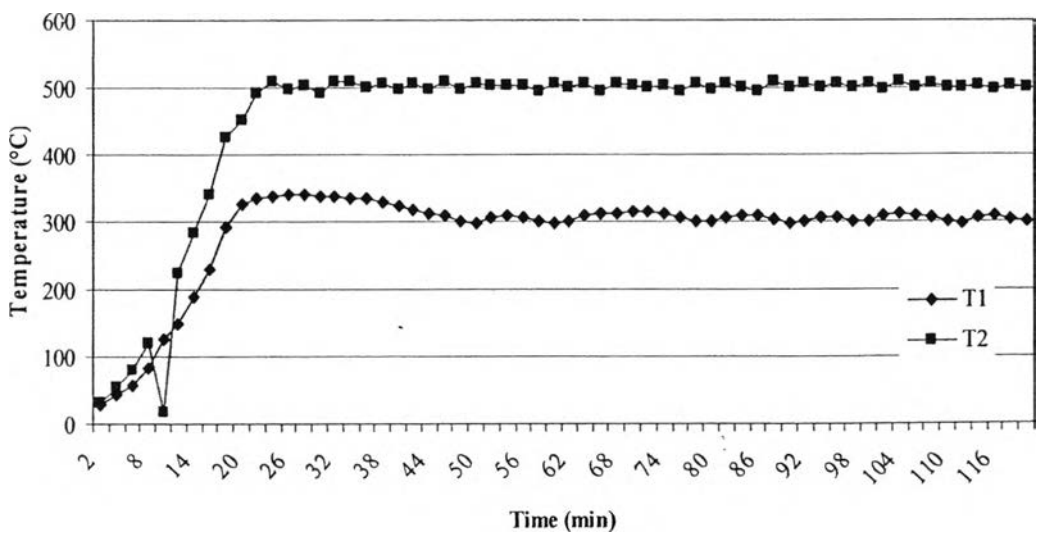

Figure A6 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.6).

Table A7 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.4)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	28.1	27.1	32	322.8	501.0	62	296.3	503.9	92	301.3	499.7
4	38.5	43.6	34	321.1	497.3	64	310.1	494.4	94	297.2	493.9
6	59.7	75.5	36	318.0	504.1	66	315.1	503.7	96	300.3	505.5
8	83.7	111.0	38	310.8	491.0	68	314.0	497.6	98	307.9	499.6
10	117.1	159.2	40	306.4	499.9	70	312.0	502.5	100	305.6	499.4
12	153.7	209.0	42	301.0	497.8	72	309.1	491.9	102	301.9	493.3
14	195.1	267.4	44	298.3	501.9	74	304.8	505.0	104	297.9	507.0
16	249.1	330.5	46	306.1	494.1	76	301.5	499.4	106	305.7	498.7
18	287.5	400.7	48	314.5	504.0	78	297.3	497.9	108	305.7	502.4
20	319.6	426.5	50	314.5	497.2	80	305.2	508.4	110	302.5	492.7
22	320.6	459.6	52	312.4	503.8	82	307.5	504.3	112	297.5	506.5
24	316.5	503.9	54	309.4	493.6	84	307.7	504.1	114	301.1	497.3
26	326.6	499.5	56	303.9	506.7	86	308.8	497.0	116	307.4	502.8
28	323.2	505.1	58	300.4	497.2	88	308.4	505.4	118	305.7	492.1
30	324.3	494.8	60	293.7	511.3	90	305.3	497.7	120	302.4	504.9

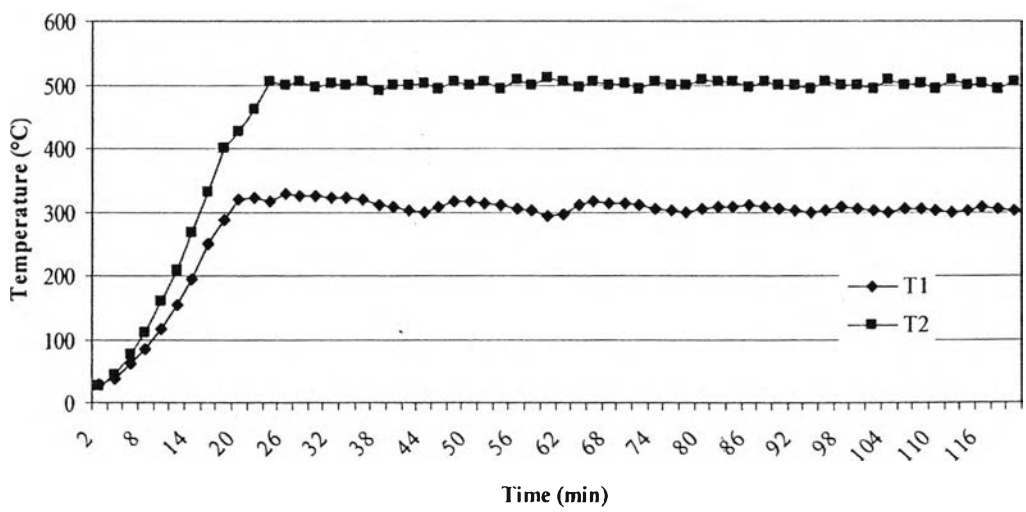

Figure A7 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.4).

Table A8 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.2)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.0	26.1	32	335.5	500.9	62	309.9	500.0	92	296.7	497.1
4	26.9	47.1	34	332.6	500.0	64	304.8	504.3	94	300.5	502.2
6	59.2	4.2	36	329.6	504.1	66	299.7	498.5	96	306.8	497.1
8	74.0	17.5	38	325.0	490.5	68	296.4	504.2	98	311.4	503.5
10	104.4	160.0	40	321.1	497.5	70	303.6	493.8	100	311.4	494.0
12	131.6	206.2	42	316.0	498.1	72	309.6	506.1	102	307.7	503.2
14	175.2	275.4	44	311.9	501.7	74	308.9	497.8	104	303.5	503.4
16	214.0	329.1	46	306.9	495.0	76	305.1	499.6	106	299.3	496.3
18	260.2	410.2	48	302.8	491.5	78	300.5	493.5	108	298.3	505.1
20	329.6	461.1	50	298.4	504.8	80	297.2	507.9	110	309.2	498.6
22	339.1	495.1	52	301.8	506.0	82	303.5	499.1	112	309.6	505.9
24	341.2	506.7	54	308.0	504.5	84	309.9	505.0	114	306.5	492.6
26	338.5	498.7	56	311.8	496.3	86	309.2	494.2	116	304.2	499.8
28	336.9	501.3	58	303.7	513.0	88	306.1	506.9	118	300.6	502.0
30	338.1	497.4	60	312.3	496.9	90	301.8	500.0	120	296.5	505.3

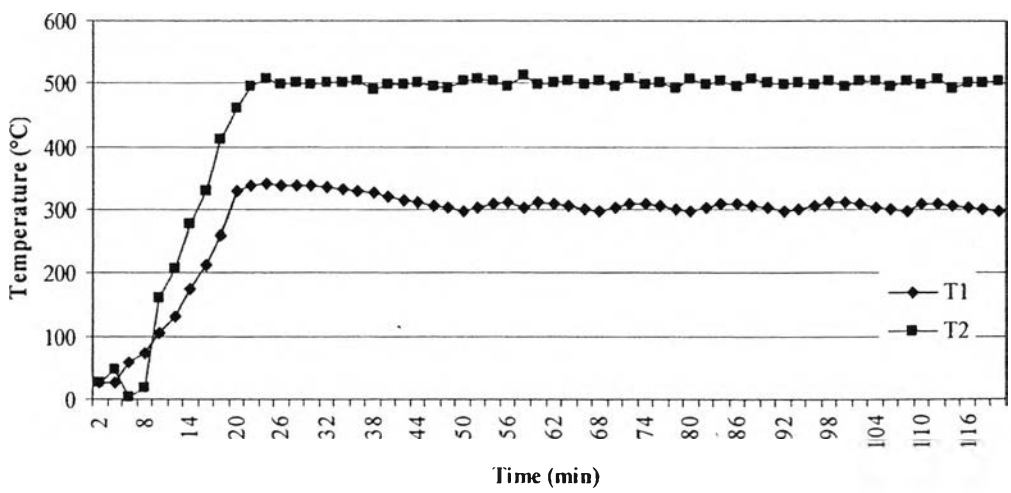

Figure A8 Temperature profiles of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.2).

Table A9 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.8)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.4	33.7	32	338.4	499.0	62	304.3	498.8	92	296.4	504.4
4	39.9	49.2	34	331.0	504.5	64	301.7	506.1	94	297.7	495.4
6	56.9	77.7	36	327.5	497.6	66	297.5	495.6	96	305.6	507.1
8	80.2	116.4	38	322.5	503.5	68	299.4	506.7	98	306.4	503.2
10	110.8	165.5	40	320.4	495.5	70	305.4	504.2	100	304.1	502.7
12	148.0	223.9	42	318.0	504.7	72	306.3	501	102	301.1	503.2
14	186.3	281.3	44	313.6	498.9	74	304.0	503.8	104	298.0	494.7
16	234.6	351.4	46	309.4	506.1	76	300.9	495.8	106	305.3	507.5
18	298.9	422.6	48	302.8	495.1	78	297.8	506.6	108	304.2	497.4
20	332.4	474.0	50	299.1	501.3	80	302.8	503.6	110	303.7	504.0
22	337.4	502.3	52	301.0	503.1	82	313.3	502.2	112	298.1	494.4
24	342.2	506.6	54	312.3	507.7	84	310.8	499.6	114	296.7	497.2
26	345.4	499.7	56	314.6	502.8	86	308.5	493.4	116	299.9	507.9
28	345.7	500.2	58	313.7	494.4	88	302.2	506.2	118	310.2	499.5
30	343.2	489.2	60	309.8	505.9	90	299.3	498.3	120	309.7	507.5

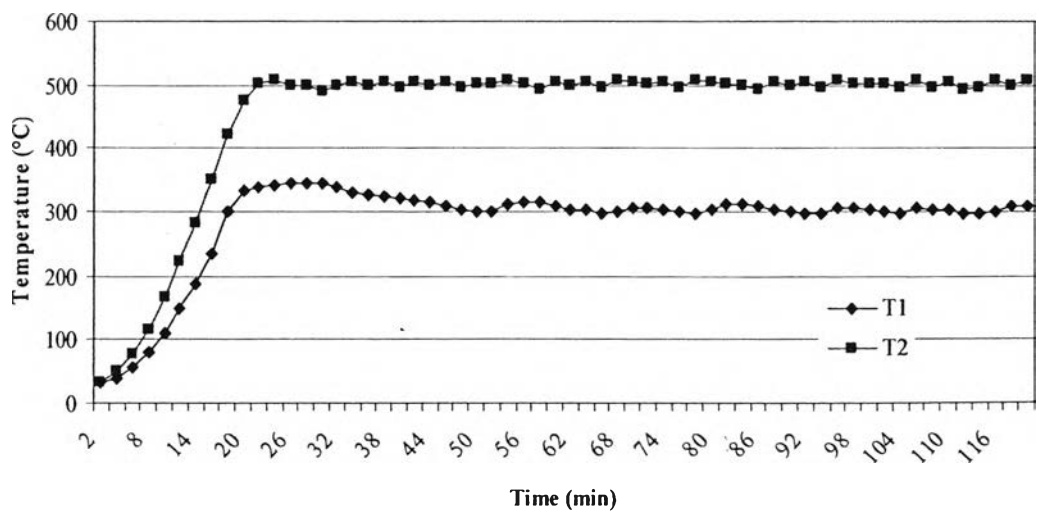

Figure A9 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.8).

Table A10 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.6)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	33.3	39.6	32	325.0	502.1	62	300.5	496.1	92	303.7	504.6
4	49.2	66.4	34	323.1	498.7	64	296.6	499.5	94	302.2	503.7
6	68.8	100.3	36	321.0	496.9	66	298.4	505.7	96	299.6	493.8
8	98.9	150.3	38	316.3	497.1	68	308.1	501.0	98	296.4	508.8
10	129.6	200.0	40	311.2	497.8	70	312.8	504.3	100	298.1	505.7
12	163.7	254.2	42	309.3	494.7	72	315.7	492.3	102	314.6	504.5
14	207.4	312.7	44	303.3	498.2	74	315.7	504.6	104	315.3	503.4
16	254.8	376.6	46	297.1	509.0	76	314.7	498.0	106	318.6	491.8
18	324.4	434.4	48	301.3	502.4	78	312.5	500.3	108	318.9	501.1
20	326.3	454.2	50	309.2	488.9	80	309.2	493.0	110	317.0	498.4
22	337.8	500.8	52	310.0	505.7	82	305.0	505.1	112	313.6	504.7
24	333.7	506.3	54	309.0	502.4	84	300.9	498.0	114	310.1	493.9
26	331.8	501.9	56	307.6	501.9	86	298.2	501.9	116	306.0	506.9
28	331.9	497.9	58	305.5	499.0	88	305.0	492.3	118	303.1	498.7
30	329.9	505.6	60	303.1	502.9	90	306.4	506.4	120	298.4	506.4

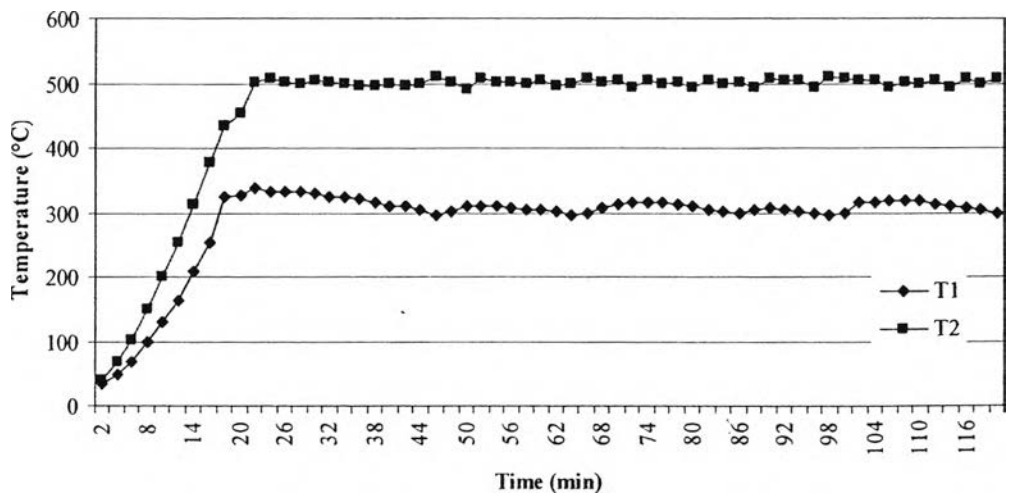

Figure A10 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.6).

Table A11 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.4)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	27.6	26.4	32	334.3	504.9	62	309.2	505.5	92	299.5	504.9
4	35.4	41.0	34	333.9	498.4	64	307.7	494.4	94	302.1	502.5
6	51.5	67.9	36	333.5	502.7	66	303.2	505.3	96	310.5	505.2
8	76.6	107.2	38	333.6	490.2	68	298.9	499.6	98	312.7	489.2
10	105.6	151.6	40	331.5	497.5	70	303.2	503.6	100	312.7	504.0
12	145.9	208.6	42	329.2	502.2	72	308.9	492.7	102	310.4	502.2
14	183.1	257.5	44	326.6	502.2	74	307.7	506.7	104	305.1	493.9
16	232.4	319.9	46	323.2	498.9	76	304.8	496.6	106	300.2	505.0
18	271.1	385.9	48	319.2	504.8	78	300.6	501.7	108	297.5	500.4
20	322.5	436.6	50	314.0	498.7	80	298.0	494.0	110	308.2	505.2
22	334.8	464.4	52	308.5	495.7	82	301.5	497.1	112	309.4	495.4
24	332.4	488.3	54	302.7	509.0	84	310.1	499.2	114	304.6	505.1
26	335.1	504.7	56	298.0	501.3	86	308.2	499.9	116	301.8	497.3
28	336.7	501.4	58	305.1	506.1	88	303.2	500.9	118	296.1	501.1
30	334.9	498.3	60	309.6	499.3	90	302.1	500.2	120	298.2	492.0

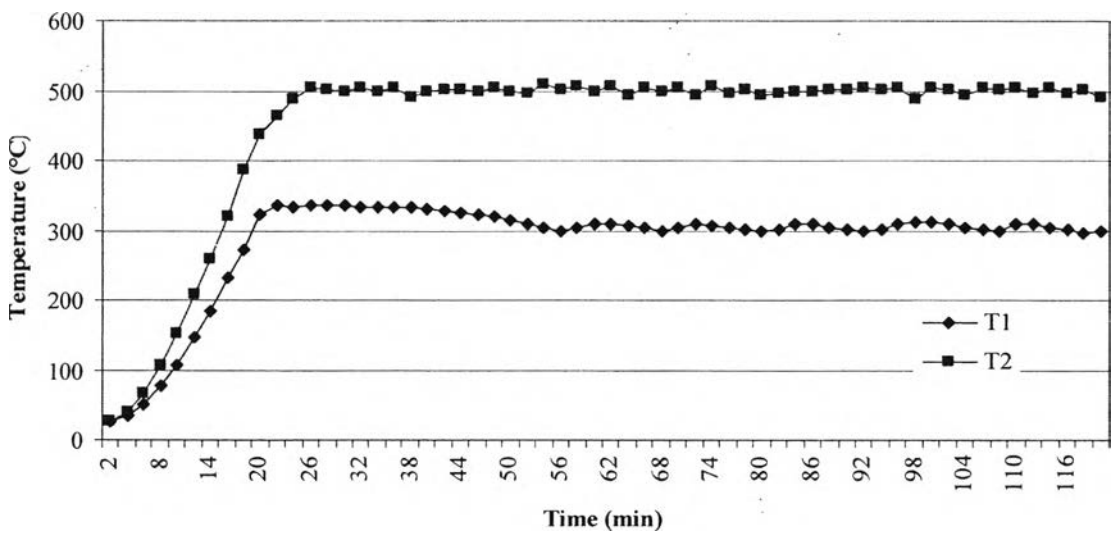

Figure A11 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.4).

Table A12 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.2)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	28.7	25.4	32	337.5	507.2	62	310.3	492.8	92	308.4	503.7
4	38.0	37.7	34	337.5	504.4	64	309.0	503.9	94	307.9	495.9
6	54.5	62.2	36	335.2	501.5	66	306.5	502.0	96	305.4	509.9
8	79.5	98.7	38	331.9	501.5	68	302.4	504.7	98	305.0	504.2
10	106.1	137.1	40	326.7	496.1	70	297.8	497.5	100	305.6	503.6
12	148.8	198.9	42	324.1	494.3	72	298.7	505.6	102	306.2	504.2
14	195.5	265.3	44	319.7	507.2	74	307.8	500.9	104	298.8	497.8
16	242.1	328.5	46	316.0	501.0	76	310.9	504.9	106	302.2	505.8
18	282.2	397.0	48	312.0	506.4	78	310.6	496.9	108	298.8	498.8
20	325.1	440.6	50	309.1	500.5	80	305.5	503.7	110	301.1	506.4
22	339.7	469.9	52	304.5	492.3	82	303.9	501.3	112	308.9	499.2
24	339.8	504.7	54	298.6	500.9	84	301.3	495.5	114	309.3	501.8
26	338.9	499.2	56	298.6	502.7	86	300.4	501.8	116	308.9	504.8
28	337.1	508.1	58	306.7	500.5	88	299.9	506.3	118	309.3	502.2
30	335.8	496.4	60	309.7	499.7	90	307.1	502.2	120	306.9	505.5

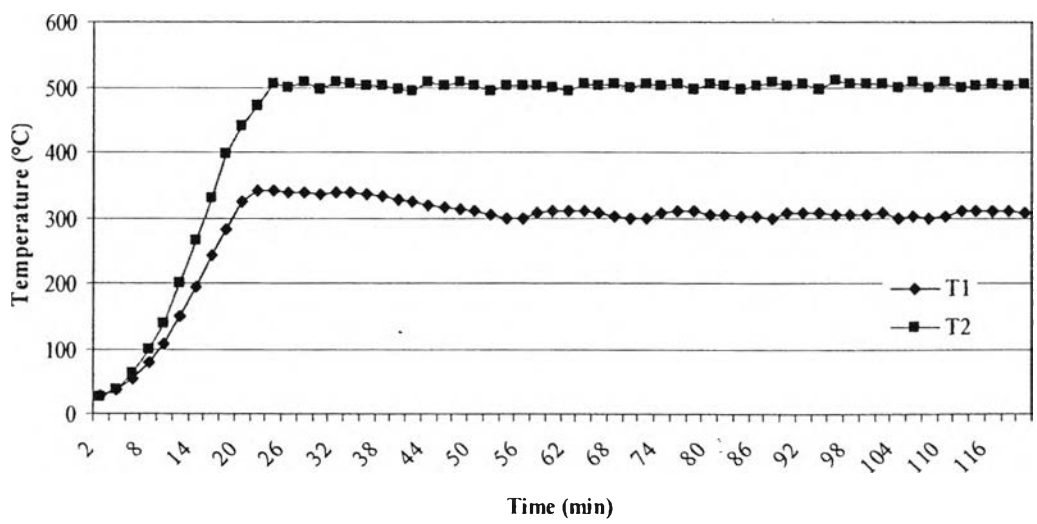

Figure A12 Temperature profiles of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.2).

Table A13 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.8)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.2	25.8	32	345.5	505.8	62	314.5	503.9	92	296.0	508.4
4	34.7	43.9	34	341.8	500.2	64	313.4	499.3	94	306.0	502.0
6	50.2	70.5	36	339.2	502.6	66	310.5	502.0	96	314.0	503.7
8	73.0	110.0	38	335.4	491.0	68	305.7	493.8	98	318.3	497.4
10	101.3	156.1	40	330.4	505.6	70	302.1	506.5	100	318.8	504.5
12	129.4	201.8	42	325.8	499.1	72	297.0	503.7	102	316.5	498.4
14	173.8	272.0	44	320.9	502.9	74	297.0	500.2	104	312.9	502.3
16	213.5	331.8	46	316.6	490.7	76	307.3	500.6	106	308.1	493.3
18	260.4	411.5	48	310.5	505.6	78	314.6	501.3	108	303.9	505.5
20	319.9	456.9	50	306.4	498.2	80	317.2	507.1	110	300.6	498.6
22	349.2	491.2	52	301.4	499.2	82	316.0	494.3	112	297.7	505.9
24	352.1	505.2	54	296.2	507.2	84	313.5	506.0	114	296.5	501.2
26	351.6	498.2	56	303.9	504.0	86	310.3	497.4	116	308.3	495.7
28	345.0	501.6	58	310.5	502.7	88	305.2	499.9	118	316.3	503.1
30	345.6	498.1	60	314.3	494.5	90	302.5	493.7	120	317.8	498.6

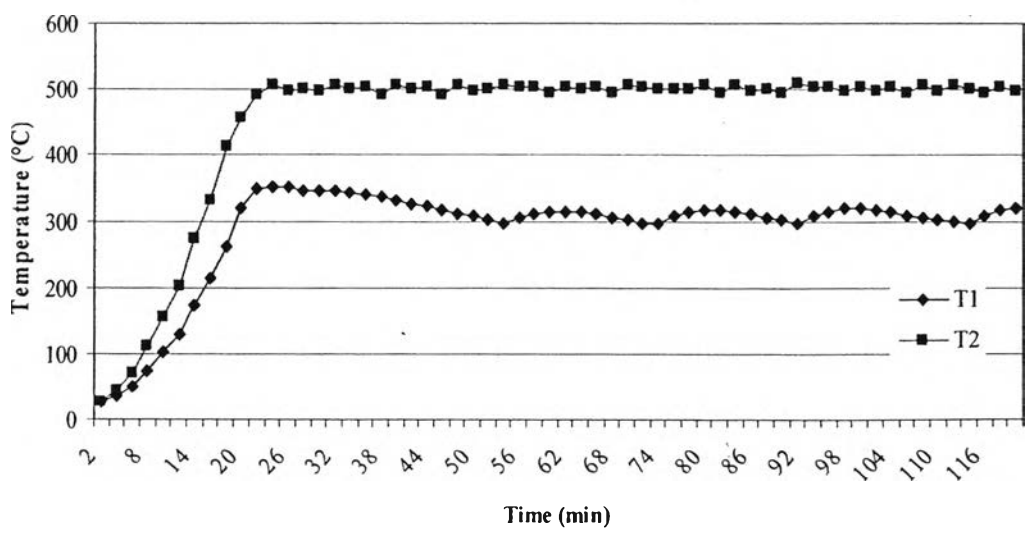

Figure A13 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.8).

Table A14 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.6)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.4	31.1	32	324.7	504.0	62	303.7	505.9	92	309.4	496.3
4	40.1	43.6	34	321.5	496.5	64	304.2	497.8	94	308.6	503.5
6	58.2	71.5	36	320.3	505.5	66	303.0	506.0	96	307.8	495.1
8	76.5	98.1	38	319.9	495.6	68	302.4	494.3	98	304.6	504.2
10	108.6	143.9	40	317.4	503.9	70	299.7	505.3	100	302.3	495.1
12	144.5	191.3	42	316.1	500.2	72	297.2	496.8	102	299.8	504.4
14	186.8	245.6	44	314.7	503.6	74	302	502.7	104	294.4	504.9
16	230.9	301.7	46	312.8	495.4	76	308.9	494.2	106	301.3	506.6
18	276.8	373.2	48	311.5	505.8	78	308.5	505.3	108	306.5	498.4
20	320.9	436.1	50	307.9	498.3	80	307.3	499.1	110	309.4	504.4
22	316.7	476.7	52	305.8	505.6	82	304.0	505.3	112	310.3	498.6
24	319.5	505.1	54	302.4	503.0	84	301.4	496.2	114	310.2	501.1
26	327.1	500.5	56	299.1	501.3	86	299.0	503.5	116	307.8	494.3
28	331.0	505.4	58	303.2	505.5	88	304.8	501.6	118	305.3	505.5
30	330.0	496.6	60	305.3	498.8	90	306.7	506.5	120	302.3	496.7

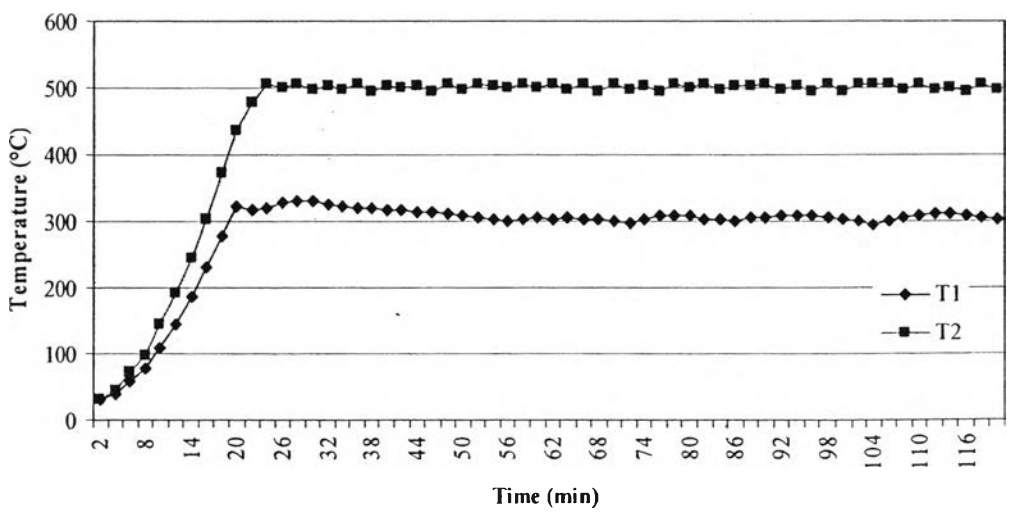

Figure A14 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.6).

Table A15 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.4)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	25.4	25.0	32	345.1	491.8	62	309.0	509.0	92	318.0	501.7
4	34.0	42.8	34	342.7	505.5	64	310.2	496.7	94	315.9	505.2
6	46.6	65.7	36	336.5	504.4	66	311.4	506.5	96	316.8	495.9
8	73.9	94.8	38	332.0	499.5	68	310.6	499.0	98	309.7	505.9
10	100.8	153.8	40	332.6	496.1	70	308.6	503.4	100	307.8	500.5
12	130.6	201.2	42	328.3	506.9	72	307.2	497.1	102	303.8	506.0
14	166.7	259.5	44	325.0	499.1	74	304.6	506.9	104	306.4	496.0
16	206.8	317.5	46	319.9	500.0	76	302.6	502.5	106	297.1	508.0
18	255.3	406.9	48	318.3	495.5	78	300.0	503.8	108	304.2	503.8
20	317.7	451.6	50	312.3	505.8	80	296.4	496.9	110	312.1	501.1
22	333.9	494.2	52	308.8	498.4	82	302.3	504.1	112	314.3	503.4
24	338.6	509.8	54	303.5	500.5	84	310.9	499.9	114	314.7	495.0
26	336.0	503.8	56	300.2	494.4	86	316.1	503.7	116	313.2	507.2
28	339.8	501.0	58	297.6	506.1	88	318.9	493.2	118	311.2	497.0
30	343.0	502.3	60	303.9	498.4	90	319.1	506.1	120	308.9	505.2

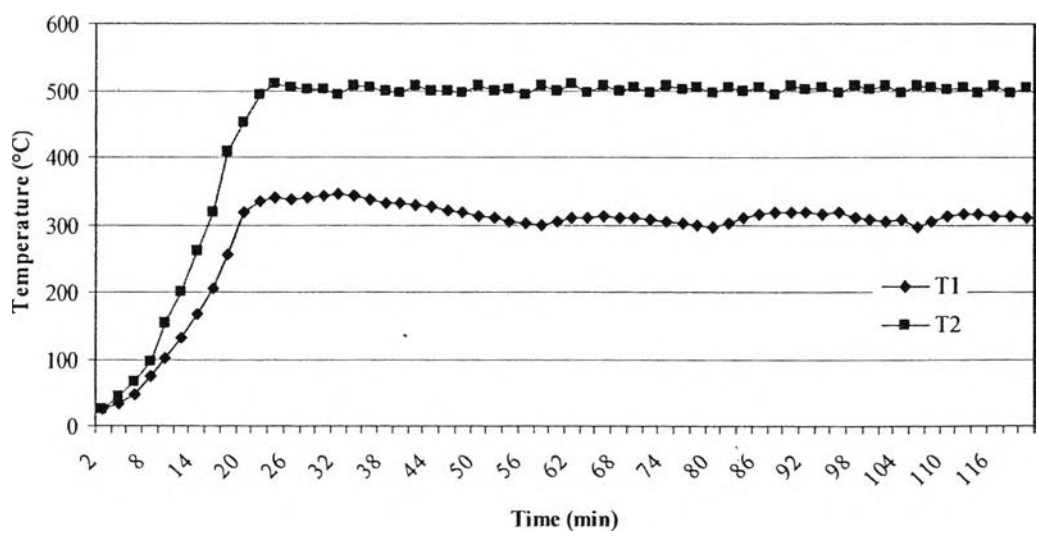

Figure A15 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.4).

Table A16 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.2)

Tire = 30 g, N_2 flow = 25 ml/min

Catalytic temperature (T1) = 300 °C

Pyrolysis temperature (T2) = 500 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.8	26.2	32	334.6	500.2	62	304.6	504.7	92	300.0	495.7
4	42.3	51.2	34	330.7	501.2	64	300.6	500.0	94	294.9	507.1
6	54.7	71.6	36	328.4	504.9	66	294.9	499.8	96	304.5	502.7
8	87.9	125.2	38	324.4	496.7	68	298.7	505.2	98	314.4	506.0
10	113.7	162.0	40	319.6	505.4	70	309.0	504.5	100	313.2	497.9
12	144.3	198.2	42	313.2	502.2	72	312.1	504.4	102	307.2	502.6
14	172.2	251.9	44	310.0	497.7	74	311.2	498.8	104	304.4	497.5
16	231.3	339.6	46	305.8	505.3	76	311.8	504.0	106	298.4	505.1
18	271.4	401.2	48	300.2	501.6	78	310.6	502.6	108	307.5	494.2
20	319.6	456.2	50	299.8	501.2	80	306.9	499.2	110	311.2	507.2
22	339.4	488.5	52	307.5	495.9	82	300.0	506.2	112	309.3	497.9
24	340.5	508.2	54	309.4	505.9	84	302.6	497.9	114	305.3	505.9
26	338.5	497.3	56	310.0	497.7	86	308.4	506.5	116	303.3	496.7
28	337.0	501.6	58	309.1	500.8	88	308.1	499.9	118	296.6	504.2
30	334.6	499.4	60	306.6	496.1	90	304.7	504.0	120	310.1	500.0

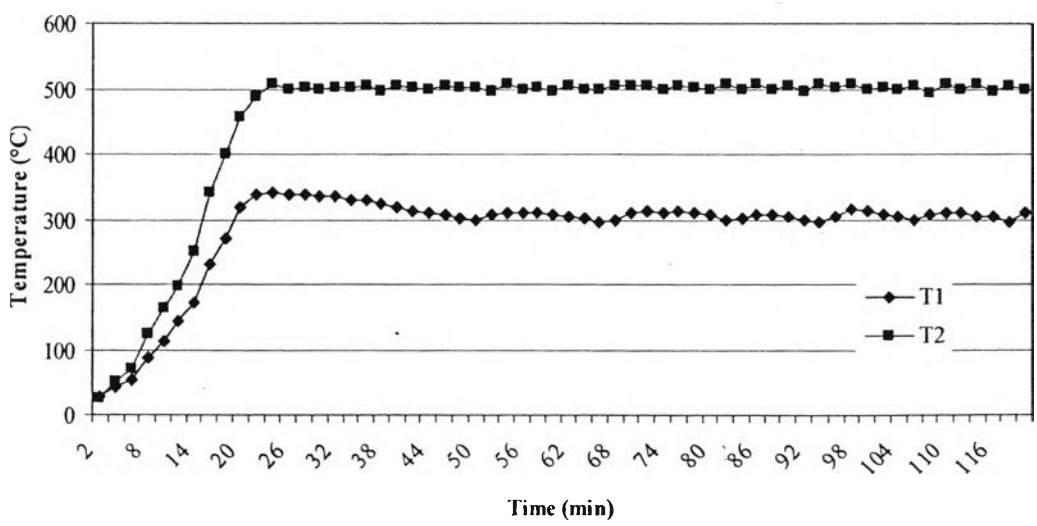

Figure A16 Temperature profiles of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.2).

APPENDIX B

B. Pyrolysis Product Yields

Table B1 Effect of Y-zeolite, Pt/Y, and Pd/Y catalysts on product yields

Sample	Yield (%)		
	Solid	Liquid	Gas
Non-catalyst	44.83	31.83	23.33
Y	45.08	24.75	30.16
Pt/Y	45.81	21.65	32.54
Pd/Y	47.39	23.54	29.07

Table B2 Effect of preparation and metal ratio of bimetallic catalysts on product yields

Sample	α_{Pd}	α_{Pt}	Yield (%)		
			Solid	Liquid	Gas
Pd-Pt/Y	0.2	0.8	46.71	24.81	28.48
	0.4	0.6	48.25	26.32	25.43
	0.6	0.4	47.22	25.62	27.15
	0.8	0.2	46.97	24.61	28.42
Pd*-Pt/Y	0.2	0.8	45.00	23.50	31.50
	0.4	0.6	44.31	25.33	30.36
	0.6	0.4	44.14	23.99	31.86
	0.8	0.2	44.14	23.99	31.79
Pd-Pt*/Y	0.8	0.2	44.22	24.61	31.17
	0.6	0.4	44.42	24.31	31.27
	0.4	0.6	43.88	24.37	31.75
	0.2	0.8	43.98	25.38	30.62

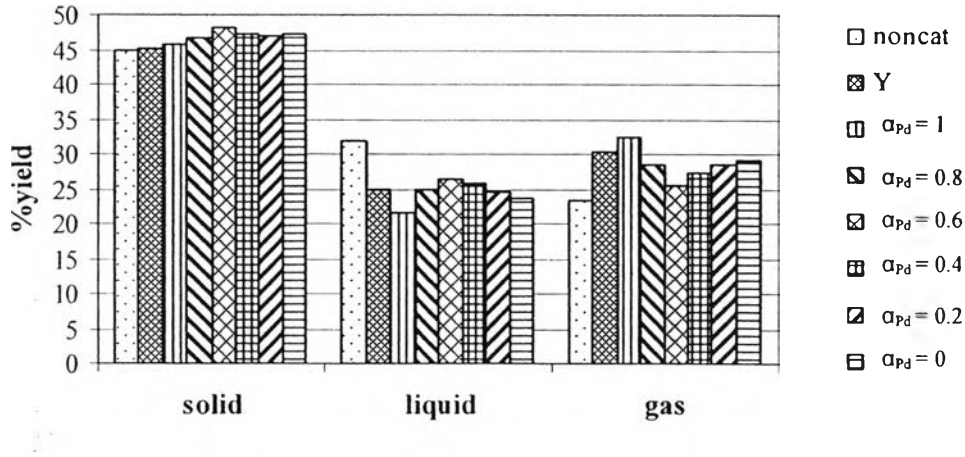

Figure B1 Influence of Pd-Pt/Y catalysts on product yields.

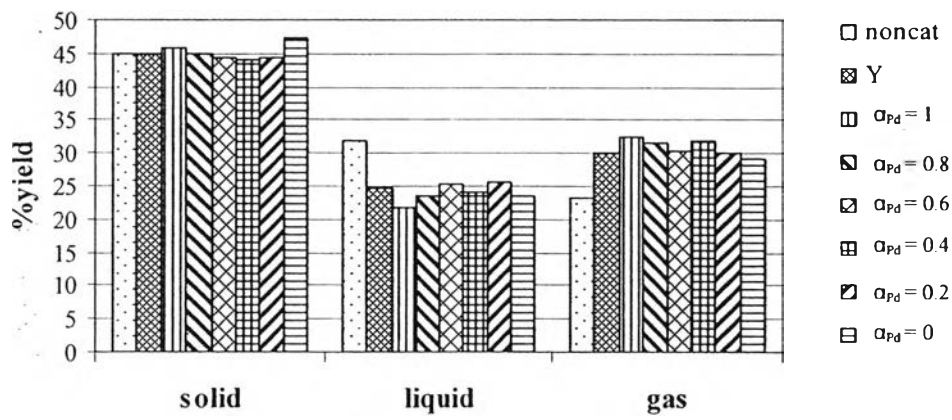

Figure B2 Influence of Pd*-Pt/Y catalysts on product yields.

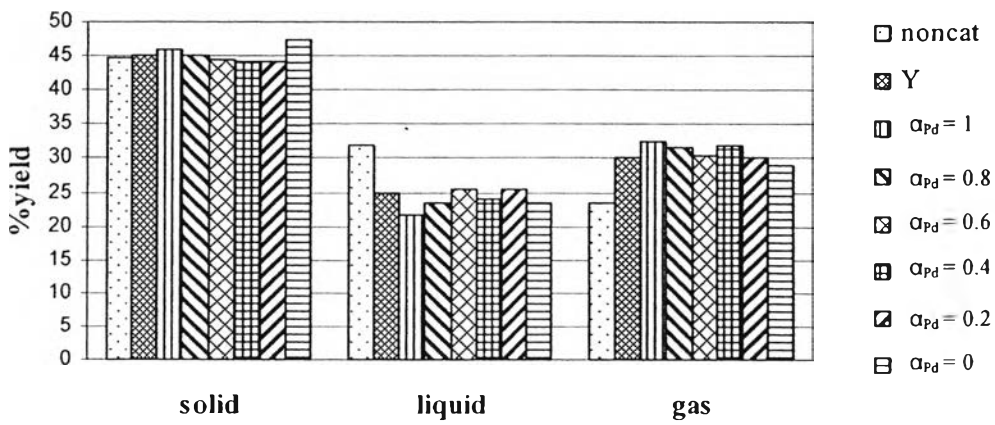

Figure B3 Influence of Pd-Pt*/Y catalysts on product yields.

APPENDIX C

C. Chemical Compositions in Maltenes

Table C1 Effect of Y-zeolite, Pt/Y, and Pd/Y catalysts on the chemical composition of oil

Compound	Yield (g / 100 g tire)			
	Non-catalyst	Y	Pt/Y	Pd/Y
Saturated HCs	15.1	13.5	13.0	12.2
Mono-aromatics	4.28	3.72	3.50	3.17
Di-aromatics	2.83	2.22	2.65	2.59
Poly-aromatics	3.08	2.28	1.94	1.80
Polar-aromatics	5.06	3.00	1.80	1.58

Table C2 Effect of Pd-Pt/Y catalysts on the chemical composition of oil

Compound	Yield (g / 100 g tire)					
	$\alpha_{Pd} = 0$	$\alpha_{Pd} = 0.2$	$\alpha_{Pd} = 0.4$	$\alpha_{Pd} = 0.6$	$\alpha_{Pd} = 0.8$	$\alpha_{Pd} = 1$
Saturated HCs	13.0	13.7	14.7	15.0	14.1	12.2
Mono-aromatics	3.50	3.59	3.48	3.65	3.57	3.17
Di-aromatics	2.65	2.67	2.69	2.79	2.68	2.59
Poly-aromatics	1.94	2.26	2.36	2.41	2.23	1.80
Polar-aromatics	1.80	1.54	1.63	1.82	1.67	1.58

Table C3 Effect of Pd*-Pt/Y catalysts on the chemical composition of oil

Compound	Yield (g / 100 g tire)					
	$\alpha_{Pd} = 0$	$\alpha_{Pd} = 0.2$	$\alpha_{Pd} = 0.4$	$\alpha_{Pd} = 0.6$	$\alpha_{Pd} = 0.8$	$\alpha_{Pd} = 1$
Saturated HCs	13.0	14.6	14.0	14.3	13.8	12.2
Mono-aromatics	3.50	3.76	3.47	3.81	3.28	3.17
Di-aromatics	2.65	2.55	2.24	2.46	2.24	2.59
Poly-aromatics	1.94	2.43	2.13	2.28	2.02	1.80
Polar-aromatics	1.80	1.64	1.60	1.60	1.42	1.58

Table C4 Effect of Pd-Pt*/Y catalysts on the chemical composition of oil

Compound	Yield (g / 100 g tire)					
	$\alpha_{Pd} = 0$	$\alpha_{Pd} = 0.2$	$\alpha_{Pd} = 0.4$	$\alpha_{Pd} = 0.6$	$\alpha_{Pd} = 0.8$	$\alpha_{Pd} = 1$
Saturated HCs	13.0	15.2	13.9	13.3	15.1	12.2
Mono-aromatics	3.50	3.43	4.30	4.06	3.31	3.17
Di-aromatics	2.65	2.53	3.07	2.66	2.58	2.59
Poly-aromatics	1.94	2.32	2.64	2.44	2.31	1.80
Polar-aromatics	1.80	1.58	1.78	1.52	1.58	1.58

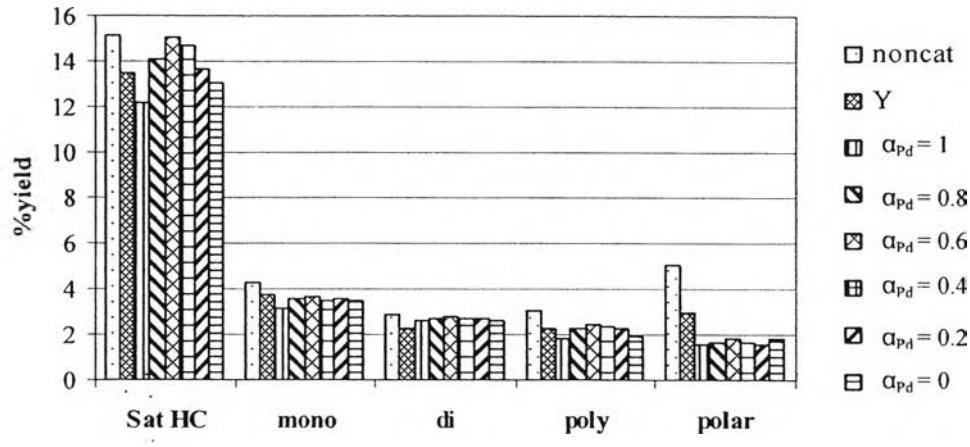

Figure C1 Effect of the α_{Pd} of co-impregnation catalysts (Pd-Pt/Y) on the chemical composition of oil.

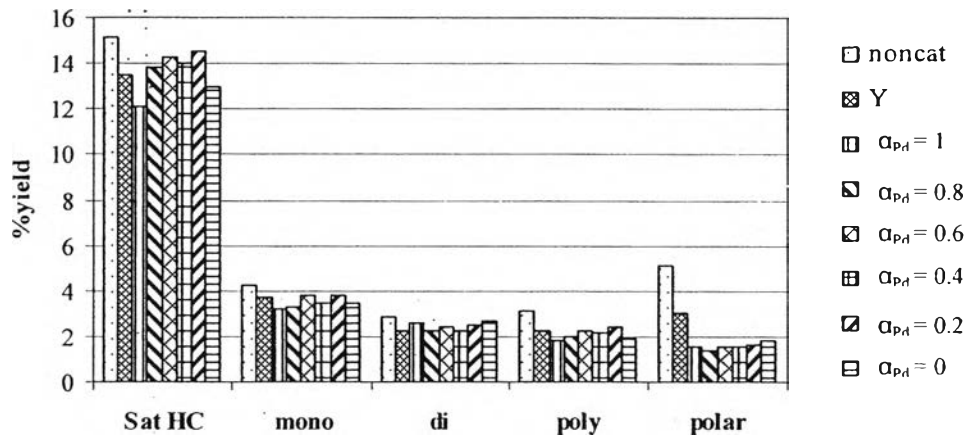

Figure C2 Effect of the α_{Pd} of successive-impregnation catalysts (Pd*-Pt/Y) on the chemical composition of oil.

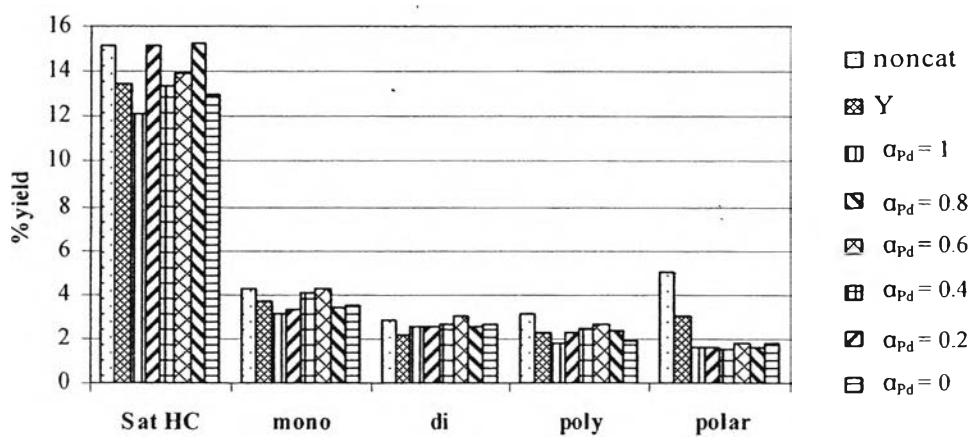

Figure C3 Effect of the α_{Pd} of successive-impregnation catalysts (Pd-Pt*/Y) on the chemical composition of oil.

APPENDIX D

D. True Boiling Point Curves

Table D1 True boiling point curves of pyrolysis without a catalyst

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	27.5	39	23.5	22.2	23.9	22.7
5	162.3	184.2	163.8	27.1	73.3	39.2
10	173.8	192.5	208.2	35	74.2	177.1
15	189.8	203.4	231.7	76.4	75.4	190.6
20	199.2	210.7	252.1	184.7	158.8	197.6
25	208	216.8	269.9	199.8	172.8	203.8
30	214.3	223.6	283.3	212.4	192.3	211.9
35	222.4	230.6	291.8	226.7	213.9	222.6
40	230.5	237.5	301.3	241.9	250.3	234.8
45	238.6	246.5	307.6	263.3	272.8	247.7
50	249.3	255	314.5	291	296	261
55	259.7	264.9	321.1	323.9	313.1	274.1
60	271	273.8	327.7	342.6	334.5	287.3
65	282.2	283.8	334.1	354.7	344	300
70	294.7	295.2	341.8	365.3	373.7	313.8
75	310.5	309.3	349.8	376.7	383.6	329.3
80	327.8	325.7	359.1	389.4	384.3	347
85	347.9	345.8	370.4	404.7	385.2	367.5
90	372.1	370.2	385.7	423.3	388	390.8
95	400.7	401.1	410.3	451	415.2	424
100	464.9	459.8	480	499.9	487.3	498.4

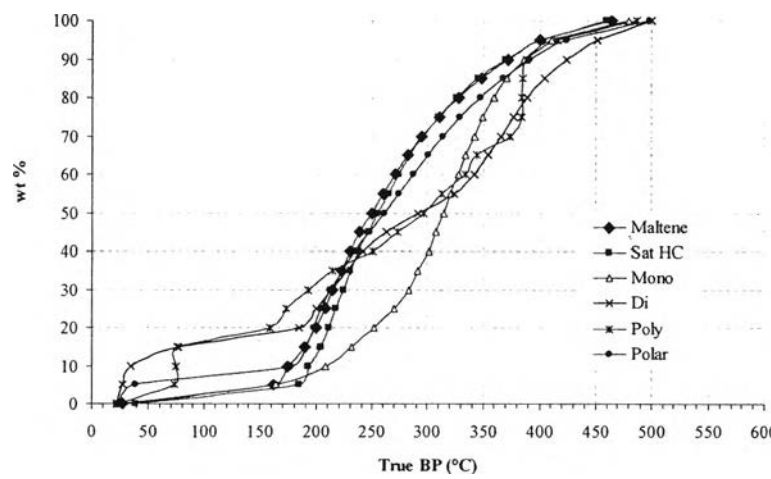

Figure D1 True boiling point curves of oils and chemical compositions obtained from pyrolysis without a catalyst.

Table D2 True boiling point curves of pyrolysis with Y-zeolite catalyst

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	71.8	26.1	22.9	22.2	35.2	22.2
5	156.1	169.6	39.9	25.2	67.7	28.6
10	168.9	180.8	182.7	30.1	68.7	38.6
15	172	186.7	211.5	35.8	69.3	74.4
20	182.8	192.9	231	74.1	69.7	75.6
25	188.2	201.7	248.6	78.5	70	190.5
30	194.5	205.8	266.4	173.9	70.4	227.7
35	201.8	211.9	281.7	225.3	70.8	250.6
40	207.3	216.9	293.4	258.6	71.2	269.3
45	213.3	222.1	304.4	280	71.6	284.5
50	219.9	228.6	313.2	294.9	71.9	296.3
55	227.5	235	321.1	308.7	72.6	308.3
60	235.6	243.1	328.3	321.3	73.7	320.4
65	247.2	252.7	335.1	332.3	75.3	332.8
70	260.3	263.3	341.9	343.5	78	347.1
75	274.7	274.4	349.2	355.1	156.4	363.7
80	291.8	287.2	357.4	367	181	383.2
85	314.1	304	367.1	380.9	256.3	386.9
90	343.5	326.8	380.3	399	341.9	398.1
95	384	360.8	403.7	427.2	383.5	427.3
100	452.3	437.4	477.5	485	423	492

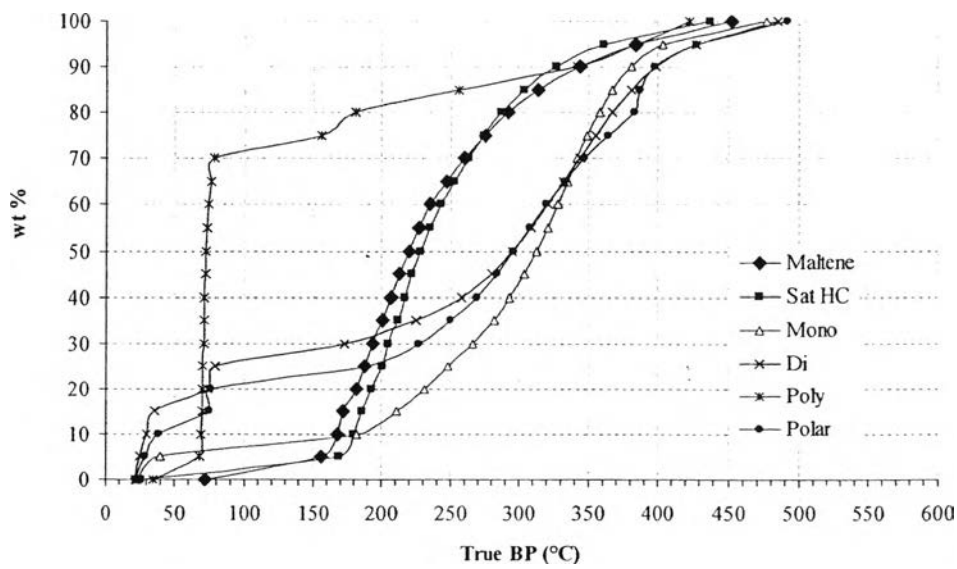

Figure D2 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Y-zeolite catalyst.

Table D3 True boiling point curves of pyrolysis with Pd/Y catalyst

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-Aromatics	Poly-aromatics	Polar-aromatics
0	74.5	72.6	23.3	21.6	21.6	22
5	152.5	157.9	71.4	27.1	70.5	32.9
10	155.4	170.3	75.2	44.5	70.9	167.6
15	164.6	180.1	78.6	69.2	71.3	171.9
20	169.5	187.1	172.8	72.4	71.6	183.6
25	172.2	194.8	215.6	73.2	72	195.8
30	183.4	202.5	259.6	74	72.4	199.8
35	190.3	210.3	286.4	75.1	72.8	207.8
40	199.9	217	299.2	76.2	73.2	219.6
45	207.3	223.9	307.2	77.4	73.5	234.4
50	215.4	232.2	315.5	78.5	74.5	251.5
55	224.5	242.2	322.8	80.2	76.3	267.9
60	235.2	253.3	329.5	83.5	112	284.1
65	249.3	264.8	336.6	160.3	171	298.4
70	264.3	275.6	343.7	179	195.8	313.4
75	278.6	287	351.1	199.2	242	328.9
80	294.3	300.2	359.3	223.9	305.2	346.8
85	313.5	316.9	368.7	268.7	337	367.2
90	336.3	336.7	380.7	339.7	383.8	388.1
95	368.9	366.6	400.3	385.2	385.6	417.3
100	431.9	430.4	464.5	468.8	450.9	490.1

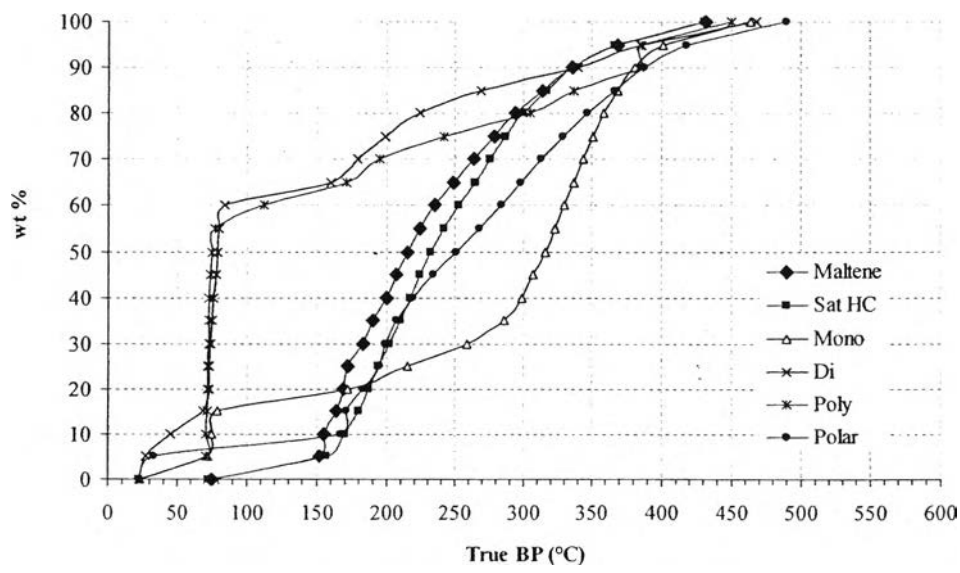

Figure D3 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd/Y catalyst.

Table D4 True boiling point curves of pyrolysis with Pt/Y catalyst

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	22.5	61.5	32.2	33.5	63.9	22
5	112.2	78.3	71.9	73.2	64.9	38.4
10	153.6	155.6	74.3	77.1	66	157.2
15	156.1	168.7	78.6	149.4	67	158.6
20	160.7	171.6	156.2	158.6	68.1	164.9
25	169.6	180.3	190.8	170.3	69.1	177.6
30	172.1	185.3	209.2	179.9	69.4	197
35	181.7	191.7	212.3	191.7	69.8	207.8
40	188.1	200.7	226.2	217.7	70.4	226
45	196	206.4	231.1	253.4	71.2	246.2
50	204.6	213.6	236.8	271.1	72.3	265
55	213.5	220.5	248.5	284.2	74	282.7
60	222.9	229.3	258.4	294.3	77.3	299.8
65	233.9	239.3	269	305.6	156.9	312.3
70	248.7	252.4	278.8	317.2	175.5	320.4
75	265.1	266.5	290.2	329.4	275.8	336.4
80	283.2	282	303.4	341.8	305.7	340.6
85	305.2	302.6	321.1	356.5	325.9	366.2
90	331.9	329.5	342.8	373.4	348.1	386.6
95	368.8	368.3	374.4	397.8	374.4	414.6
100	441.8	439.2	446.5	454.3	443.9	480.8

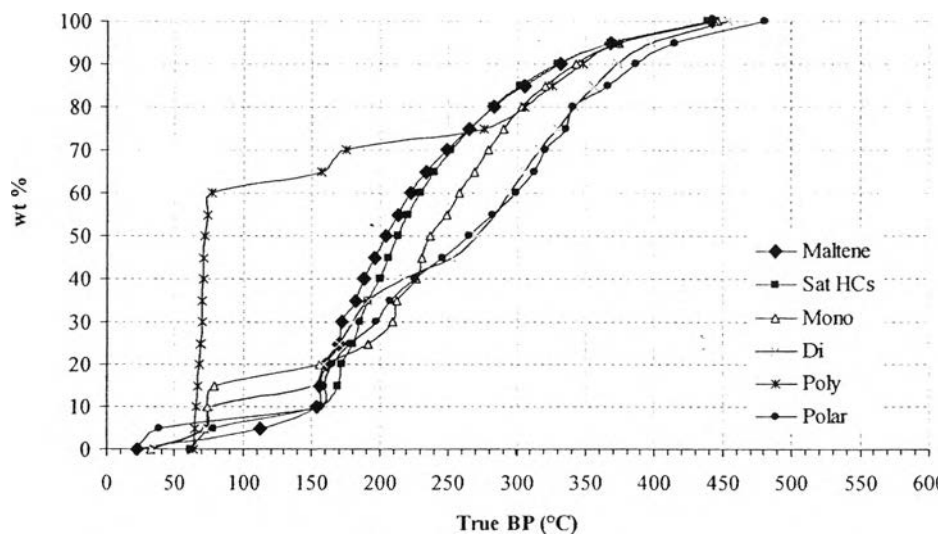

Figure D4 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pt/Y catalyst.

Table D5 True boiling point curves of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.8)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	29	70.6	45	24.8	33.9	22
5	122.7	153.2	72.6	72.6	69.7	74.1
10	154.2	166.9	76.1	75	70	155.3
15	157.9	170.5	112.6	79.1	70.4	155.7
20	168	175.9	159.6	154.2	70.9	156.1
25	170.7	182.4	172.3	158	71.5	156.7
30	173.7	187.9	192.2	169.6	72.3	158.2
35	183.5	191.4	211.2	172.2	73.4	166.5
40	189.4	199.3	223.2	184.2	75.7	182.8
45	193.2	203.8	231.4	197.3	150	192.7
50	202.4	210.2	237.1	235.6	168.3	194.3
55	209.7	215.2	250.2	261.4	193.2	196
60	215.9	221.4	259.1	274.4	274.8	202.8
65	225.1	229.6	269.9	287.7	294.6	204.5
70	235	238.5	278.7	297.9	310.9	212.7
75	249.8	250.9	288.9	309.4	320.9	215.2
80	267	265.2	300.7	324	335.2	233.5
85	286.7	282.3	317.2	339.4	345.6	256.2
90	313.6	307.3	336.4	358.3	365.6	289.1
95	352.7	346.6	365.8	384.4	384.8	338.4
100	433.9	425.1	433.7	448	447	446.8

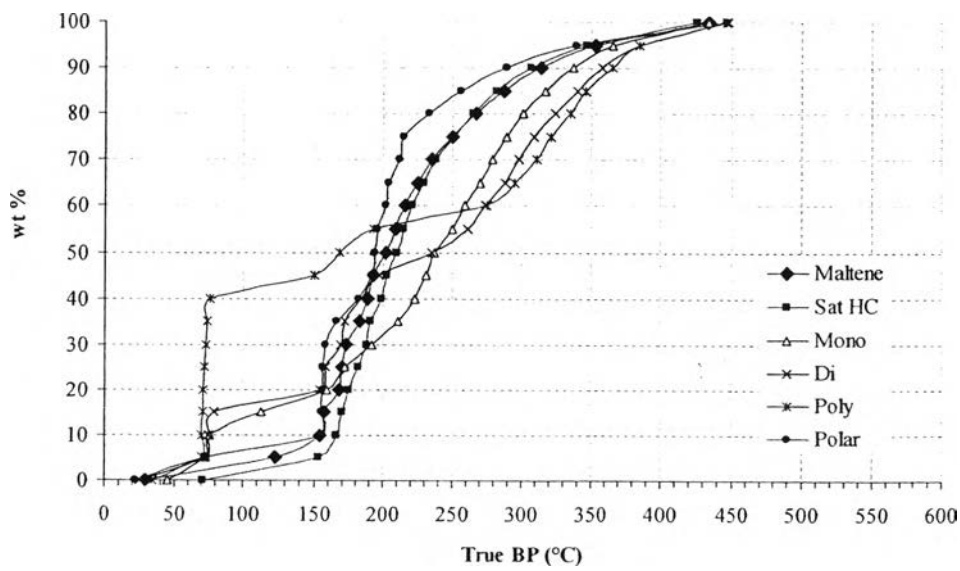

Figure D5 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.8).

Table D6 True boiling point curves of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.6)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	22.2	70.2	29.5	22.7	61.3	21.6
5	109.3	151.3	71.9	62.8	62.4	35.4
10	116	158.3	74.4	71.6	63.4	72.8
15	152	169.1	78.5	72.9	64.5	157.8
20	154.6	172	154.7	74.6	65.6	166.8
25	158.5	181.4	170.3	76.4	66.6	186.9
30	167.9	187.1	191.1	80.2	67.7	193.7
35	170.6	192.8	212.4	156.8	68.7	196.7
40	176.8	201.1	229.2	189.7	69.3	202.3
45	184.5	208.2	236.2	246.9	69.9	213
50	191.8	214.2	249.5	266.9	70.8	228.9
55	202.6	221.6	258.9	277.1	72.2	247
60	212.3	230.5	269.3	290.5	74.5	265.3
65	222.4	240.6	278.4	301.8	157.7	280.8
70	235.3	253.1	288.7	312.9	290.6	296.5
75	253	267.3	299.9	325.9	310.9	314.1
80	273	282.8	314.4	338.9	326.4	335.3
85	296.5	303.5	331.2	353.5	339.9	362.5
90	326.3	330.7	352.8	372	360	385.9
95	366.7	369.5	381.4	398	387	416
100	444	436.4	452.8	457.5	450.1	489.9

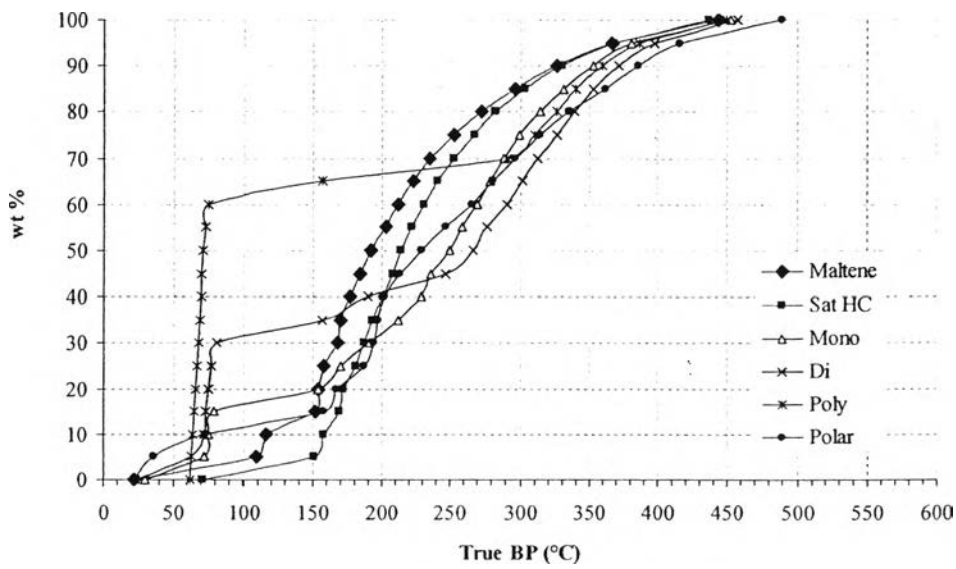

Figure D6 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.6).

Table D7 True boiling point curves of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.4)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	30.3	67.3	26.7	27.5	27.1	22.5
5	125.7	152.6	73.1	73.5	71.9	36.9
10	153.7	166.8	76.2	77.2	72.6	74.5
15	157	170.3	80.2	85.7	73.5	75.3
20	167	176.8	183.6	158.2	75.2	85.4
25	169.8	183.1	227.4	170.1	158.4	168.4
30	172.1	189.3	235.6	176.1	192.7	190
35	181.2	196	248.8	188.8	262.9	196.5
40	186.7	202.6	255.6	210.1	292.7	201
45	193.3	210.4	266.8	254.3	306.7	210.5
50	203	217.1	274.1	274.3	311.8	223.2
55	212.4	224.9	283.6	287.5	320.4	239.3
60	222	234.3	291.7	297	329.9	257.2
65	234.1	246.5	300.9	306.7	335.7	273.1
70	250.4	259.9	311.7	317.4	341.8	289.4
75	268.3	274.4	323.8	329.5	351.4	305.3
80	286.1	290.6	336.7	342.6	361.3	323.4
85	308.4	312.2	352.8	358.2	373.1	347.4
90	334.4	338.2	371.3	377.9	388.1	382.6
95	371.1	375.2	398.6	405.5	411.1	403.8
100	445.2	447.4	463.3	464.4	475.6	482.5

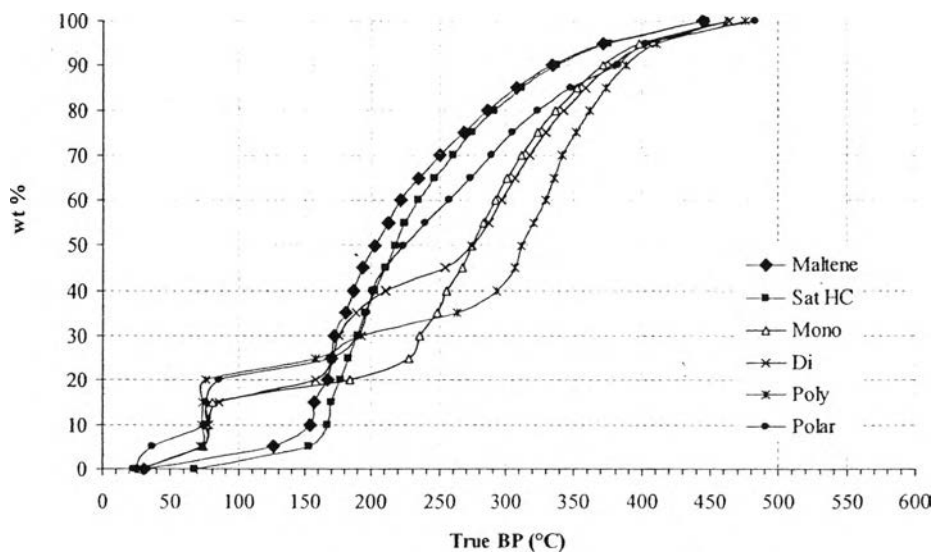

Figure D7 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.4).

Table D8 True boiling point curves of pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.2)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	22.2	63	47.5	26.7	64.7	22.2
5	110.9	80.5	69.6	72.9	65.8	35.6
10	151.2	154.7	71.3	75.5	66.8	73.8
15	153.9	166.9	73.9	79.4	68.1	74.2
20	156.8	169.9	77.8	154.5	69.1	74.7
25	165.4	173.4	86.9	160	69.7	75.3
30	169.6	181.6	155.4	170.4	70.4	77.1
35	172	186.9	168.8	180.1	71.4	183.1
40	181.2	192.4	173.7	192.6	72.8	196.3
45	187.3	201	192.3	233	75.4	200.8
50	195.4	208.1	212.4	260.4	155.7	211.3
55	205.3	215	230	274.6	181.8	228.4
60	214.8	222.7	243.5	287.6	273.4	248.5
65	227	232.6	253.8	297.4	298.2	268.5
70	240.4	244.8	266.8	307.9	310.9	287.3
75	258.2	259.2	279.1	320.3	323.7	305.3
80	277.7	275	292.1	333.9	335.5	324.5
85	300	293.9	309.6	348.2	349.4	349.4
90	328.7	319.9	332.4	367	366.8	384.7
95	367.9	358	366.1	392.9	391.3	399.4
100	447.5	423.8	443.7	452.2	449.9	478.8

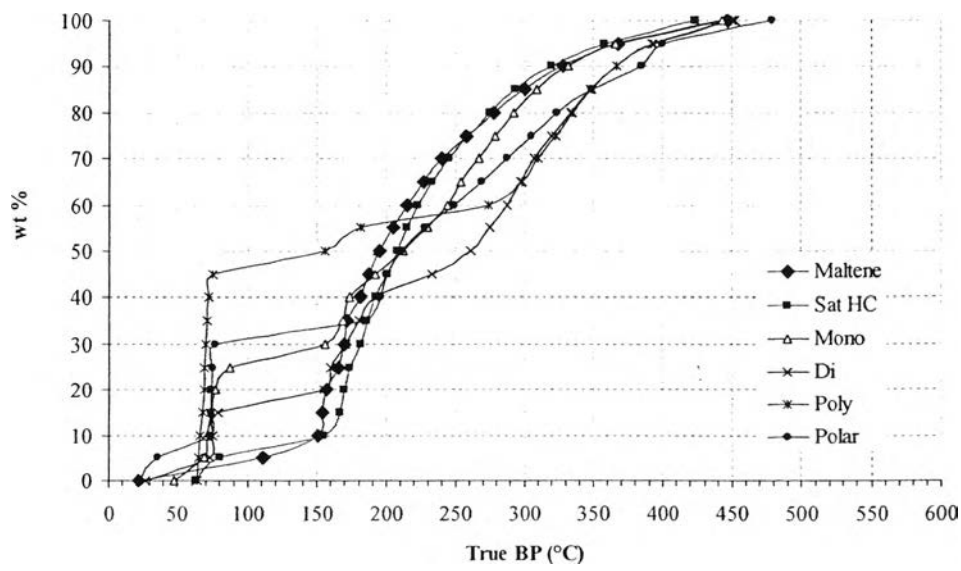

Figure D8 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt/Y catalyst (α_{Pd} = 0.2).

Table D9 True boiling point curves of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.8)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	22.5	69.4	42.4	27.5	32.4	22.2
5	111.2	154.4	73.4	72.9	69.4	155.1
10	151.4	167.5	77.8	76.6	69.8	155.5
15	154.2	170.8	158.1	103	70.2	155.8
20	157.5	178.8	191	169.2	70.6	156
25	167.2	184.2	210.4	184.3	71	156.3
30	170.1	190.5	217.7	213.3	71.5	157
35	173.5	199.5	229.6	246.8	72.2	158.5
40	183.9	205.2	236.1	264.4	73.2	167.9
45	191.2	212.8	247.8	274.8	74.8	187.7
50	202.2	219.6	256.2	286.7	78.9	194.3
55	211.7	227.1	265.9	295.3	159.5	197.5
60	221.6	236.9	275	305.3	216.2	203.4
65	233.8	249	283.9	315.6	285.5	209.1
70	249.9	261.4	293.4	326.5	304.5	214.2
75	267.7	275	305.2	337.1	315.9	233.2
80	285.5	290.1	319.5	349.2	332.4	263.1
85	307.8	311	335	363.4	343.9	296.9
90	333.8	335.8	356.3	378.7	364.1	344.7
95	369.3	371.3	384.4	403.7	385	412.4
100	441.2	438.8	453.4	464.5	453.8	471.5

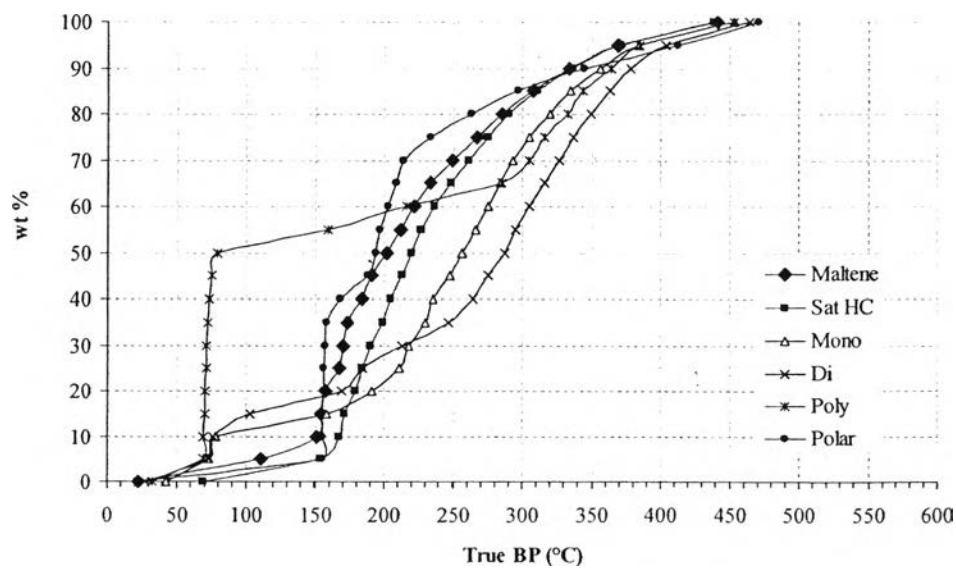

Figure D9 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.8).

Table D10 True boiling point curves of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.6)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-Aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	22.2	72.1	32.2	24.8	33.3	22.5
5	109.7	152	73.2	73.1	69.8	71.2
10	148.9	166.9	77.4	74.8	70.2	72.3
15	153.3	170.6	158.5	78.4	70.7	72.7
20	156.6	177.6	201.1	85.7	71.3	73.1
25	166.5	182.8	227.3	158.2	72.1	73.5
30	169.5	188.7	235.5	170.2	73.1	73.8
35	171.9	193.8	248	174.3	74.7	74.2
40	180.7	200.9	254.9	189.1	77.5	74.6
45	186.1	207.5	265.1	215.1	154.6	75.3
50	192.2	212.7	272.1	264.4	160	76.8
55	202.1	220	281.6	276.6	172.8	79.7
60	210.7	228.6	288.9	290.4	224.5	154.1
65	220.1	237.8	297.6	299.6	297.2	171.9
70	232.1	250.4	306.8	309.5	311.8	196.9
75	249.1	264.2	318.1	319.2	327.4	211.8
80	269.6	279.4	330.4	330.8	337	244.3
85	292.4	298.3	345.1	344	352	279.4
90	322.6	324.1	364.3	360.7	370.9	314
95	363.9	361.3	390.1	386.6	388.1	364.3
100	444.2	428.8	458.6	457	458.1	469.3

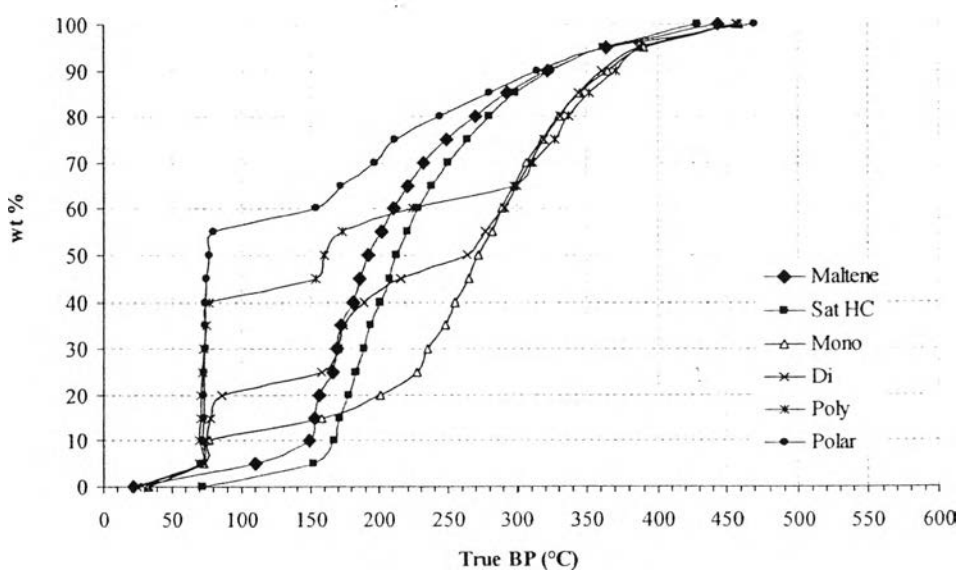

Figure D10 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.6).

Table D11 True boiling point curves of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.4)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	22	69.1	27.6	24.5	35.6	22.1
5	111.7	147	72.3	76.6	69.2	114.9
10	152.7	168	75.2	79.5	69.8	153.2
15	155.5	171.4	77.8	86.9	70.5	156.1
20	160.5	181.6	152.5	157.3	71.4	164.6
25	169.4	183.4	168.6	172.2	71.9	171.3
30	172	189.2	189.7	176.8	72.6	174.2
35	182.3	194.6	212	188.8	73.2	183
40	188.6	202	228.4	212.5	74.8	190.8
45	196.2	208.3	235.7	255.2	75.4	199.2
50	203.9	214.5	248.3	273.8	81.6	204.6
55	212.7	222.5	257.8	285.6	161.5	214.8
60	221.4	229.3	268.9	298.3	219.5	223.1
65	231.9	239.4	276.8	308.9	280.3	235.5
70	245.4	251.8	287.8	320.4	302.7	248.9
75	262	265.2	297.9	333.2	313.2	265.1
80	279.7	281.6	313.8	345.7	331.1	282.3
85	300.5	299.7	330	359.4	340.6	301
90	327.4	326.1	351.7	379.1	363.8	329.5
95	363.8	364	379.6	407.5	384.4	370.2
100	439.8	430.5	454.2	460.8	455.1	441.5

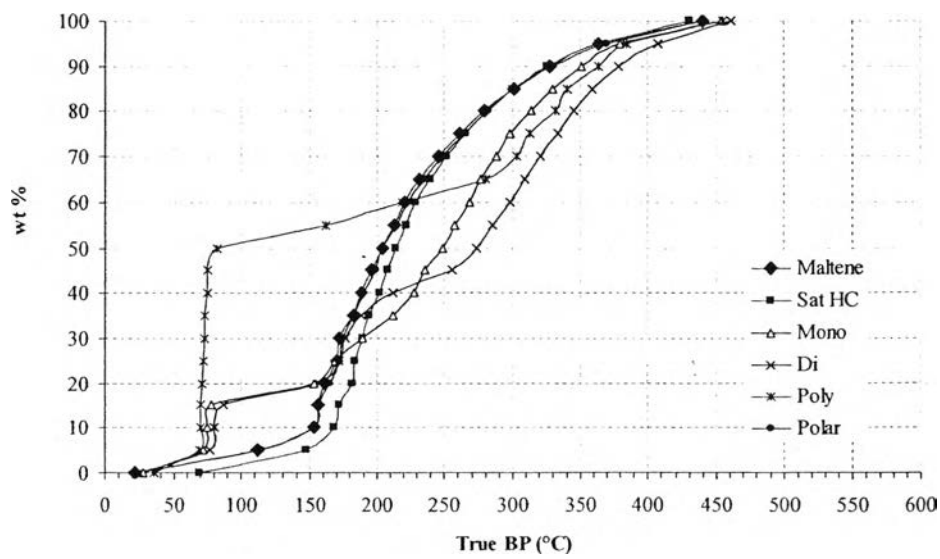

Figure D11 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.4).

Table D12 True boiling point curves of pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.2)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	29.5	34.6	22	24.4	32.2	22.5
5	136.7	70.5	30.9	74.8	105.5	36.3
10	154.6	72.9	58.1	79.6	107.4	81
15	159.8	75.4	71.3	103.6	111	156.2
20	169.4	80.5	74.3	106.3	118.1	156.8
25	172.1	155.1	75.8	107.7	146.3	157.5
30	182.5	169.5	77.3	109.6	155	158.5
35	189.3	176.2	78.7	113.7	167.9	160.8
40	196.3	186.4	80.2	117.5	193.9	169
45	203.7	195.4	83.3	147	206.7	194.4
50	212.2	205.1	111.3	155.3	223	206.1
55	220.3	213.6	121	160.4	240	213.8
60	229.8	223.2	172.2	170.4	263.1	218.7
65	241	234	199	176.8	313.2	237.9
70	254.6	248.4	220.7	187.7	346.2	261
75	270.4	264.2	245.6	199.2	369.4	286.1
80	286.5	281.1	292.5	219.1	387.5	312.7
85	306.8	301	337.3	273.3	403.1	338.7
90	330.7	325.7	380.6	353.8	418.6	368.8
95	364.2	359.7	396.2	401.4	439.3	405.3
100	438.4	433	469.6	468.6	486.5	476.3

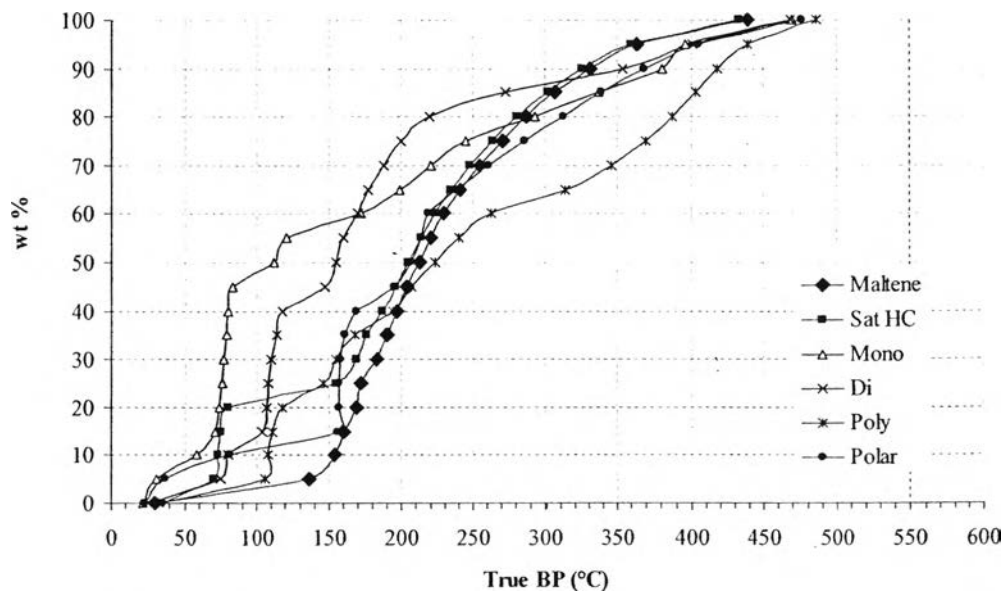

Figure D12 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd*-Pt/Y catalyst (α_{Pd} = 0.2).

Table D13 True boiling point curves of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.8)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	24.8	38.6	24.6	32.6	75.3	22.5
5	113.4	73.6	86.5	75.7	95.5	80.5
10	153.1	77.6	233.4	80.5	98.1	124.3
15	156.7	153.2	251.9	100	98.8	155.5
20	167.1	164.3	264.9	101.5	99.6	155.8
25	170.1	170.5	273.8	102.3	100.5	156.1
30	173.9	179.2	284	103.2	101.5	156.6
35	184.1	185.4	291.3	104.1	102.6	157.3
40	190.9	192.1	299.3	105.3	103.7	158.7
45	200.9	201.8	306.5	106.8	105	162.6
50	208.6	209.2	312.9	108.3	106.7	178.9
55	217.5	216.7	320.1	109.8	109.4	203.7
60	227.4	224.7	328.3	111.9	115.7	210.1
65	239.2	234.6	336.2	116.5	133.6	213.9
70	254.7	247.7	342.4	136	140	222.1
75	271.8	262.4	351.6	147.4	149.6	250.8
80	289.5	278.5	361.8	154.2	153.8	282.5
85	311.7	298.3	373.6	159.2	159.7	314.7
90	337	325.5	387.1	171.1	211.1	347.5
95	372.8	364.8	409.6	202.9	335.1	390
100	446	438.2	471.9	408.5	445.9	469.7

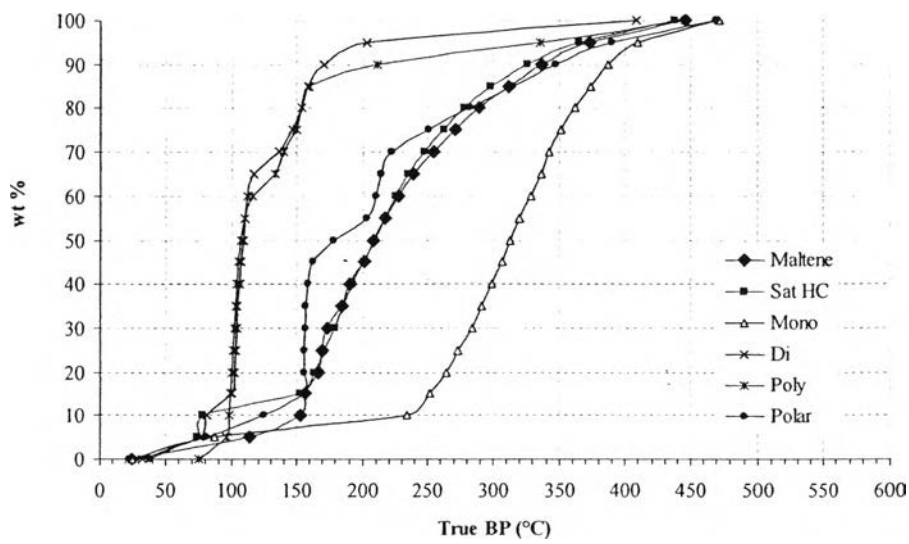

Figure D13 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.8).

Table D14 True boiling point curves of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.6)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	23.1	32.4	22.2	22	56	20.5
5	110.7	73	48.6	69.2	78.2	73.5
10	148.6	75.7	65.3	78.6	94	111.1
15	151.9	80.2	71.6	88.1	97.1	124.5
20	154	151.7	73.1	109.5	98.5	155
25	156.9	156.4	74.1	110.4	99.3	155.4
30	165.5	167.2	75	111.4	100	155.7
35	168.6	169.9	75.9	112.7	100.8	155.9
40	170.1	172.2	77.1	117	101.8	156.1
45	172.2	182.3	78.8	119.9	102.9	156.5
50	181.8	188.4	81.2	141.1	104	157.6
55	187.6	198	84.7	156.5	105.1	160.4
60	197.2	208	108.2	168.4	106.6	171.6
65	207.8	219.2	109.9	186.7	108.5	194.3
70	220	232	112.2	202.2	111.8	203.3
75	234.9	249	118.5	214.3	126.1	208.7
80	255.6	268	150.4	238	142.8	223.8
85	279.1	288.9	170.4	277.3	153.7	260
90	306.9	315.2	198.4	336.7	168.4	307.7
95	346.5	353.2	311.7	393.7	311	362.9
100	436.4	437.2	446.4	473.7	454.4	455.6

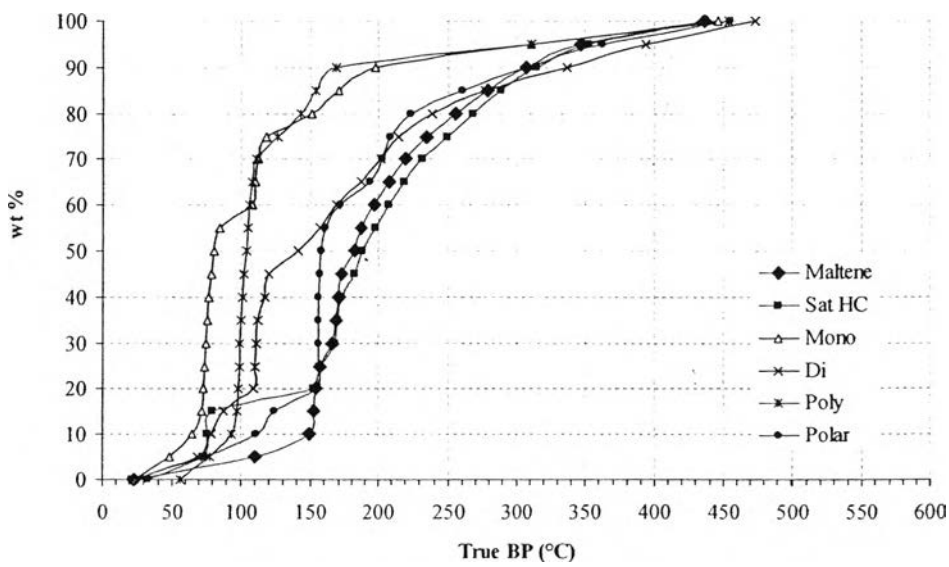

Figure D14 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.6).

Table D15 True boiling point curves of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.4)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-Aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	28.6	37.1	22.9	24.6	68.5	20.3
5	112.7	72.6	37.5	64.7	77.4	34.8
10	152.1	75.7	54.7	73.2	91.3	154.8
15	155.2	83.2	66.6	75.3	94.4	155.3
20	160.2	158.8	71.4	77.3	96.6	155.6
25	169	170.7	73.1	81.1	98.3	155.9
30	171.4	181.4	74	103.2	99.1	156.2
35	180	189.2	74.8	106.2	100.1	156.4
40	186.2	198.4	75.7	107.8	101.2	156.6
45	193.2	206.7	76.5	110.1	102.3	156.8
50	202.9	214.2	77.4	114.8	103.5	157
55	212.1	223.6	78.8	121.3	104.9	157.2
60	221.3	233.8	81.1	154.5	107	159.8
65	232.4	247.1	84.5	170.1	110.5	166.2
70	247.3	261.5	112	170.1	122	183.5
75	264.4	276.5	159.8	174.9	141.2	202.8
80	282.4	293.2	193.9	187.9	152.8	210
85	303.9	314	231.6	194.2	164.3	214.8
90	330.8	338.7	307.1	203.2	234.7	260.6
95	367.8	373.1	385.2	235.6	368.4	327.3
100	444.6	446.6	466.5	419.9	454	445.4

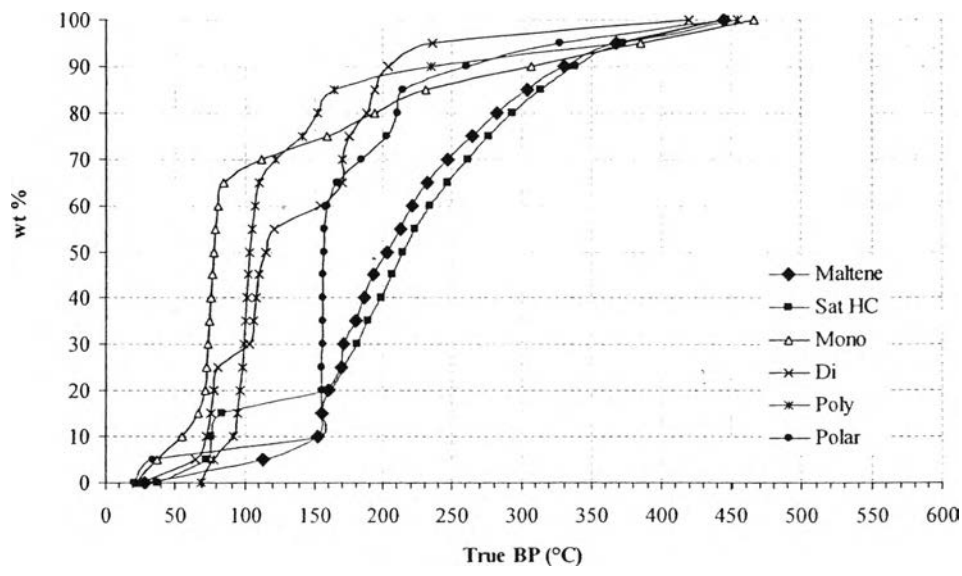

Figure D15 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.4).

Table D16 True boiling point curves of pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.2)

% Off	Boiling point (°C)					
	Maltene	Saturated HCs	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	25.6	34.6	23.5	28.8	55.4	20.3
5	111.9	74.5	41.8	71.9	60	39.2
10	152.6	79.9	56.4	74.6	67.5	113.3
15	156.3	155.3	67.3	77.2	70.7	154.8
20	166.7	169.6	71.2	81.6	72.4	155.4
25	169.9	173.8	72.3	103.4	74.5	155.8
30	173.5	185.5	73.2	105.7	76.7	156.1
35	183.9	192.5	74	107.4	78.7	156.4
40	190.5	202.4	74.8	110.3	80.8	156.6
45	199.8	210.1	75.4	114.7	83.1	156.8
50	206.7	217.8	76.4	137.2	85.8	157
55	213.9	225.8	77.5	154.1	89	157.2
60	223	235.3	79.2	157.8	92.8	158.7
65	233.5	248.3	81.8	168	97.6	168
70	247.6	262.5	86.7	170.5	100.3	192.7
75	264	277.2	112.9	174	104.9	203
80	281.4	293.9	161.5	185.2	127.2	211.9
85	302	314.4	184.9	194.1	142.1	214.5
90	328.1	338.4	208.5	204.4	157.5	255.4
95	363.7	371.7	290.8	233.8	210.3	321.1
100	439.1	442.9	432.2	421.5	420.9	436

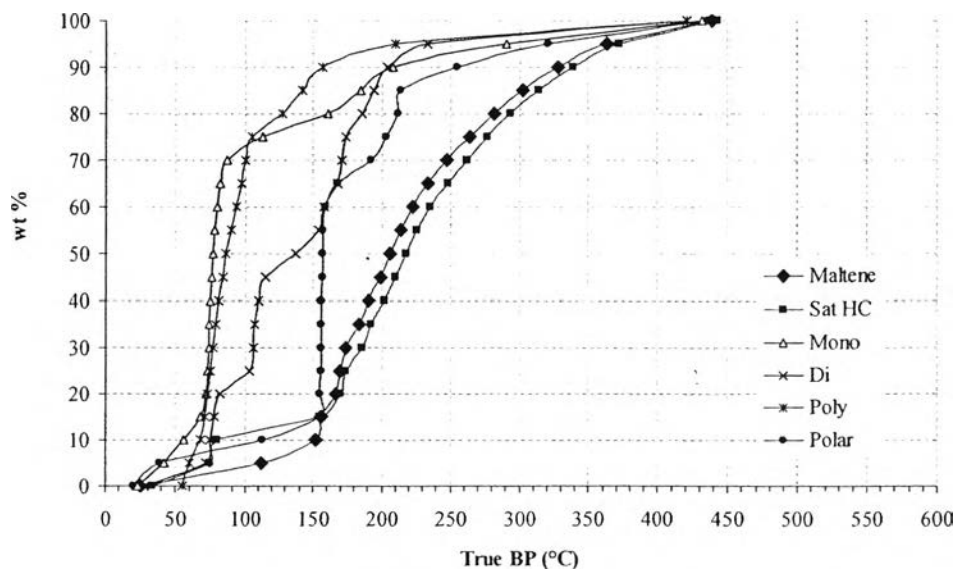

Figure D16 True boiling point curves of oils and chemical compositions obtained from pyrolysis with Pd-Pt*/Y catalyst (α_{Pd} = 0.2).

APPENDIX E

E. Liquid Petroleum Fractions in Maltenes

Table E1 Influence of Y, Pd/Y, and Pt/Y catalysts on petroleum fractions

Petroleum Fractions	Yield (g / 100 g tire)			
	Noncat	Y	Pd/Y	Pt/Y
Naphtha	6.37	8.28	9.90	11.3
Kerosene	9.55	11.5	6.19	5.16
LGO	7.00	6.37	4.21	3.28
HGO	5.73	3.82	3.22	2.58
Long residue	3.18	1.91	1.24	1.17

Table E2 Influence of bimetallic catalysts prepared by co-impregnation (Pd-Pt/Y) on petroleum fractions

Petroleum Fractions	Yield (g / 100 g tire)					
	α_{Pd} = 0	α_{Pd} = 0.2	α_{Pd} = 0.4	α_{Pd} = 0.6	α_{Pd} = 0.8	α_{Pd} = 1
Naphtha	11.3	13.5	12.6	12.9	12.2	9.90
Kerosene	5.16	4.67	5.38	6.31	5.21	6.19
LGO	3.28	2.46	3.59	3.42	3.47	4.21
HGO	2.58	2.46	2.82	2.10	2.73	3.22
Long residue	1.17	0.98	1.28	1.05	1.24	1.24

Note: $\alpha_{Pd} = 0$ refers to Pt/Y, and $\alpha_{Pd} = 1$ refers to Pd/Y

Table E3 Influence of bimetallic catalysts prepared by successive-impregnation with loading Pd first (Pd*-Pt/Y) on petroleum fractions

Petroleum Fractions	Yield (g / 100 g tire)					
	α_{Pd} = 0	α_{Pd} = 0.2	α_{Pd} = 0.4	α_{Pd} = 0.6	α_{Pd} = 0.8	α_{Pd} = 1
Naphtha	11.3	11.2	11.5	13.6	11.5	9.90
Kerosene	5.16	6.39	5.76	4.80	4.94	6.19
LGO	3.28	3.83	3.12	2.78	3.29	4.21
HGO	2.58	3.07	2.64	2.53	2.59	3.22
Long residue	1.17	1.02	0.96	1.01	1.18	1.24

Note: α_{Pd} = 0 refers to Pt/Y, and α_{Pd} = 1 refers to Pd/Y

Table E4 Influence of bimetallic catalysts are prepared by successive-impregnation with loading Pt first (Pd-Pt*/Y) on petroleum fractions

Petroleum Fractions	Yield (g / 100 g tire)					
	α_{Pd} = 0	α_{Pd} = 0.2	α_{Pd} = 0.4	α_{Pd} = 0.6	α_{Pd} = 0.8	α_{Pd} = 1
Naphtha	11.3	11.1	14.8	11.9	11.4	9.90
Kerosine	5.16	5.91	4.13	5.36	6.60	6.19
LGO	3.28	3.20	2.43	3.17	3.55	4.21
HGO	2.58	1.97	1.95	2.68	2.79	3.22
Residue	1.17	1.48	0.73	1.22	1.02	1.24

Note: α_{Pd} = 0 refers to Pt/Y, and α_{Pd} = 1 refers to Pd/Y

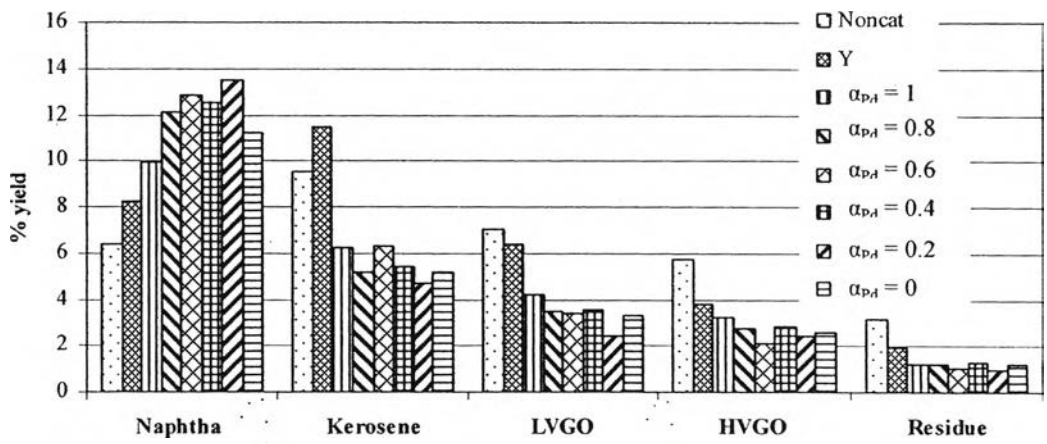

Figure E1 Effect of bimetallic catalysts (Pd-Pt/Y) on petroleum fractions.

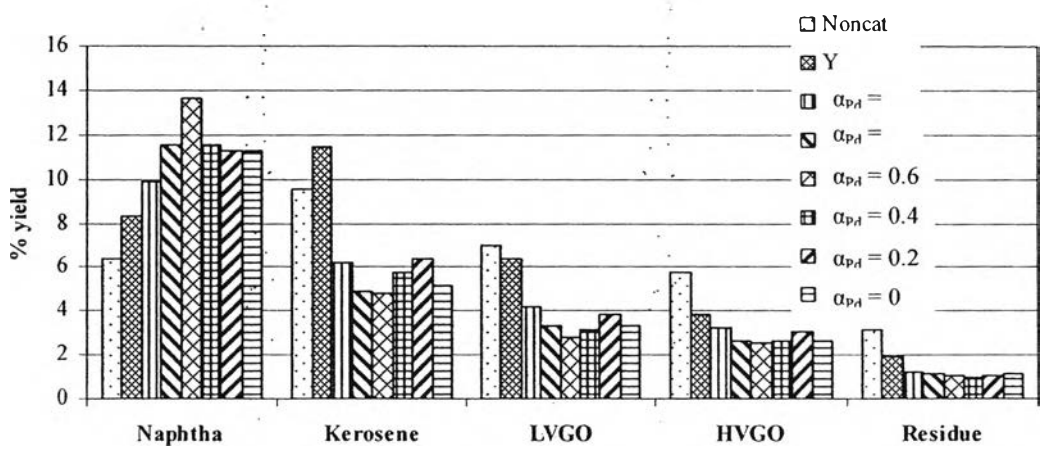

Figure E2 Effect of bimetallic catalysts (Pd*-Pt/Y) on petroleum fractions.

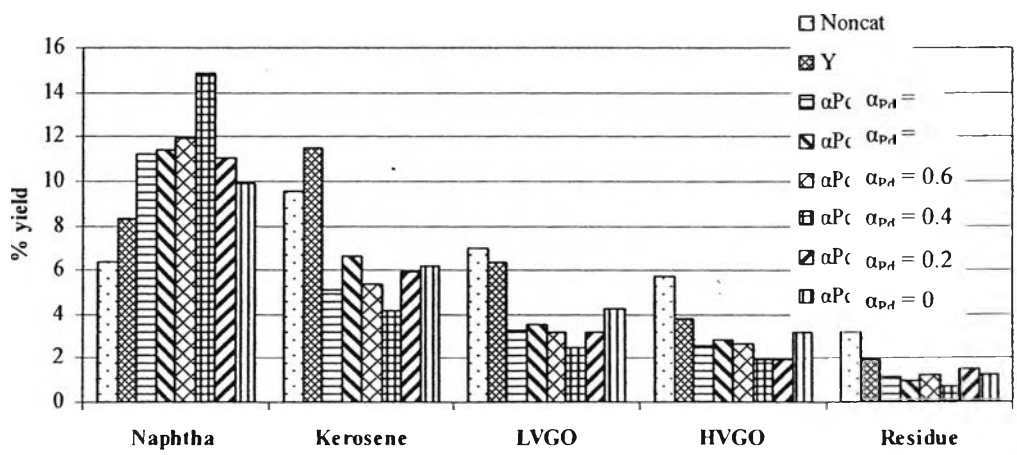

Figure E3 Effect of bimetallic catalysts (Pd-Pt*/Y) on petroleum fractions.

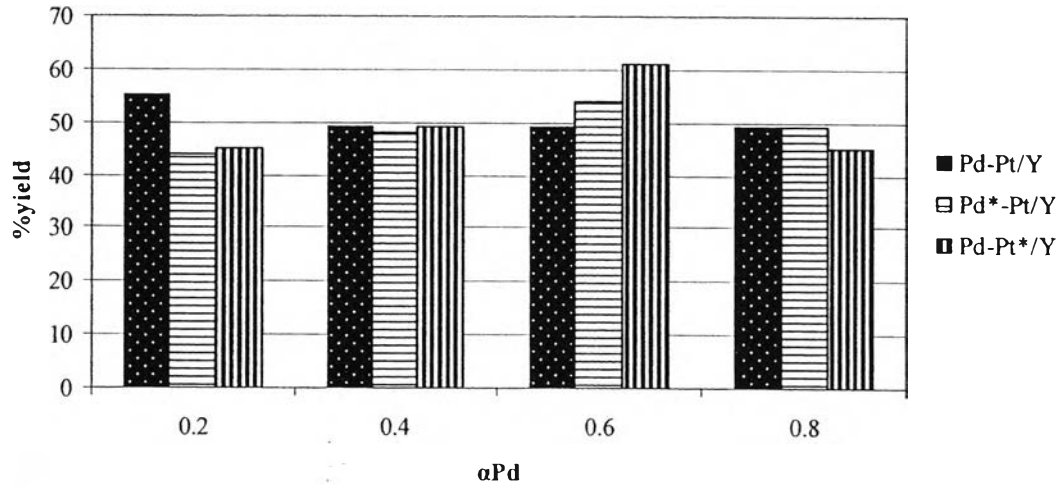

Figure E4 Effect of catalyst preparation method on naphtha yield.

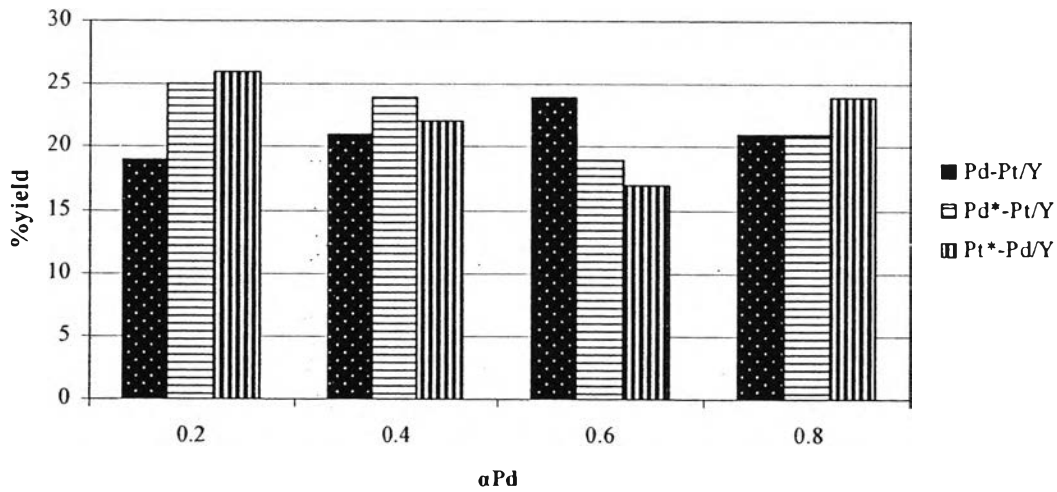

Figure E5 Effect of catalyst preparation method on kerosene yield.

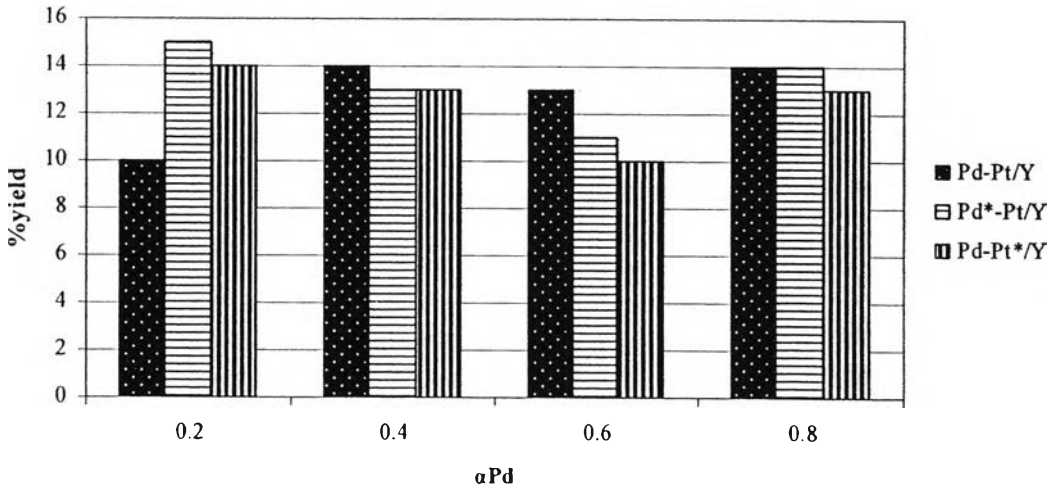

Figure E6 Effect of catalyst preparation method on LGO yield.

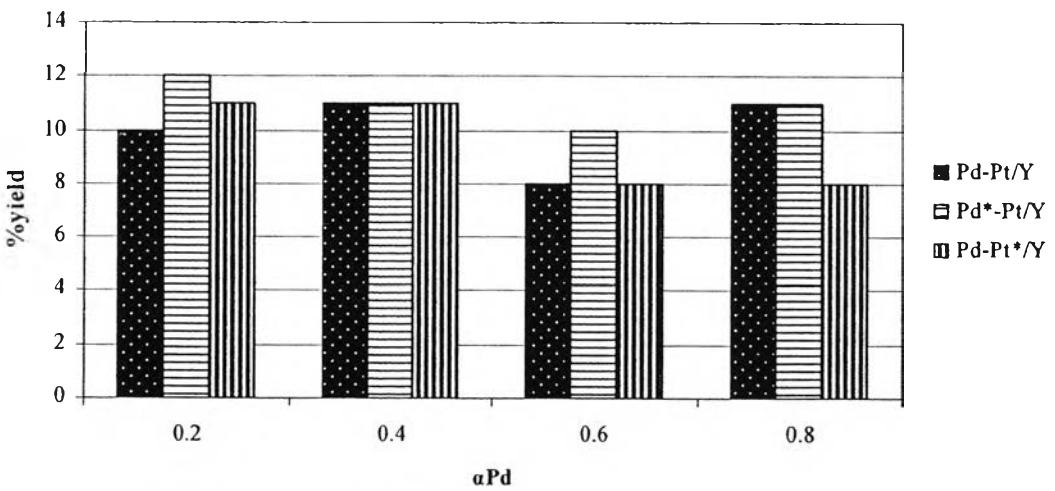

Figure E7 Effect of catalyst preparation method on HGO yield.

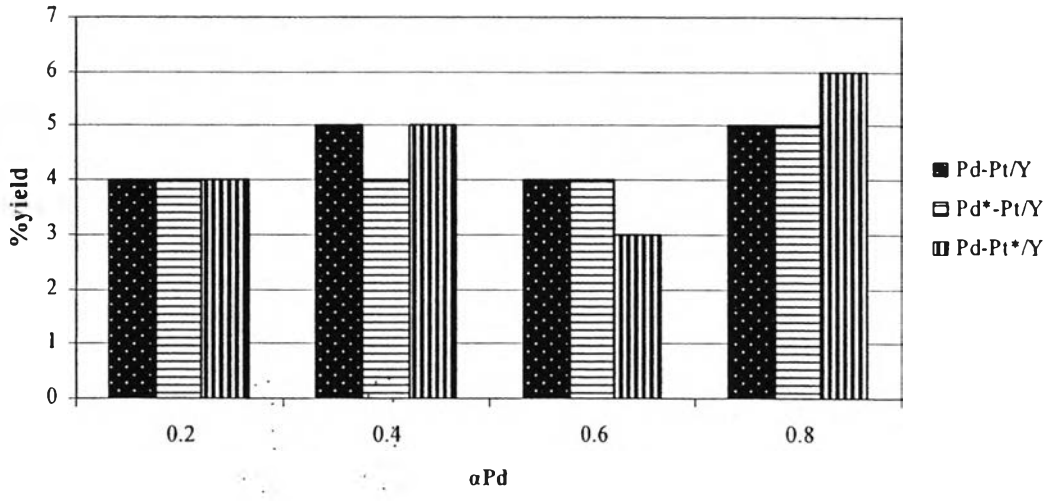

Figure E8 Effect of catalyst preparation method on long residue yield.

APPENDIX F

F. Pyrolysis Gas Composition Yields

Table F1 Influence of Y-zeolite, Pd/Y, and Pt/Y catalysts on the yield of gas compositions

Gas component	Yield (g / 100 g tire)			
	Non-catalyst	Y	Pt/Y	Pd/Y
C1	5.134	6.037	6.061	7.637
C2 =	2.452	2.564	2.633	3.081
C2	3.777	4.839	4.743	5.611
C3 =	2.765	3.272	3.324	3.807
C3	1.672	2.437	2.492	2.654
C4	4.600	5.495	6.091	6.672
C5	2.681	2.401	3.164	2.724
C6	0.222	0.187	0.411	0.295
C7	0.015	0.035	0.046	0.050
C8	0.014	0.001	0.013	0.006

Table F2 Influence of metal ratio of bimetallic catalysts (Pd-Pt/Y) on the yield of gas compositions

Gas component	Yield (g / 100 g tire)					
	$\alpha_{Pd} = 0$	$\alpha_{Pd} = 0.2$	$\alpha_{Pd} = 0.4$	$\alpha_{Pd} = 0.6$	$\alpha_{Pd} = 0.8$	$\alpha_{Pd} = 1$
C1	6.061	5.603	5.724	4.592	6.163	7.637
C2 =	2.633	2.417	2.415	2.140	2.156	3.081
C2	4.743	4.644	4.404	4.007	4.225	5.611
C3 =	3.324	3.347	3.035	2.864	3.387	3.807
C3	2.492	2.484	2.206	2.192	2.235	2.654
C4	6.091	6.388	5.421	5.431	6.271	6.672
C5	3.164	2.885	3.339	3.626	3.192	2.724
C6	0.411	0.542	0.547	0.468	0.736	0.295
C7	0.046	0.057	0.063	0.056	0.098	0.050
C8	0.013	0.006	0.009	0.006	0.017	0.006

Note: $\alpha_{Pd} = 0$ refers to Pt/Y, and $\alpha_{Pd} = 1$ refers to Pd/Y

Table F3 Influence of metal ratio of bimetallic catalysts (Pd*-Pt/Y) on the yield of gas compositions

Gas component	Yield (g / 100 g tire)					
	$\alpha_{Pd} = 0$	$\alpha_{Pd} = 0.2$	$\alpha_{Pd} = 0.4$	$\alpha_{Pd} = 0.6$	$\alpha_{Pd} = 0.8$	$\alpha_{Pd} = 1$
C1	6.061	6.019	6.560	6.445	6.325	7.637
C2 =	2.633	2.746	2.920	2.756	2.864	3.081
C2	4.743	5.063	5.465	4.906	5.264	5.611
C3 =	3.324	3.506	3.732	3.443	3.666	3.807
C3	2.492	2.673	2.794	2.453	2.719	2.654
C4	6.091	6.547	6.896	6.136	6.822	6.672
C5	3.164	3.145	2.854	3.655	3.254	2.724
C6	0.411	0.432	0.508	0.441	0.493	0.295
C7	0.046	0.051	0.054	0.053	0.077	0.050
C8	0.013	0.007	0.008	0.008	0.016	0.006

Note: $\alpha_{Pd} = 0$ refers to Pt/Y, and $\alpha_{Pd} = 1$ refers to Pd/Y

Table F4 Influence of metal ratio of bimetallic catalysts (Pd-Pt*/Y) on the yield of gas compositions

Gas component	Yield (g / 100 g tire)					
	$\alpha_{Pt} = 0$	$\alpha_{Pt} = 0.2$	$\alpha_{Pt} = 0.4$	$\alpha_{Pt} = 0.6$	$\alpha_{Pt} = 0.8$	$\alpha_{Pt} = 1$
C1	7.637	5.974	6.464	6.548	5.750	6.061
C2 =	3.081	2.785	2.984	3.018	2.750	2.633
C2	5.611	5.085	5.451	5.522	5.258	4.743
C3 =	3.807	3.558	3.679	3.736	3.570	3.324
C3	2.654	2.787	2.735	2.841	2.824	2.492
C4	6.672	6.837	6.614	6.948	7.107	6.091
C5	2.724	2.888	2.648	2.655	2.839	3.164
C6	0.295	0.457	0.569	0.357	0.439	0.411
C7	0.050	0.056	0.065	0.048	0.066	0.046
C8	0.006	0.011	0.013	0.012	0.013	0.013

Note: $\alpha_{Pd} = 0$ refers to Pt/Y, and $\alpha_{Pd} = 1$ refers to Pd/Y

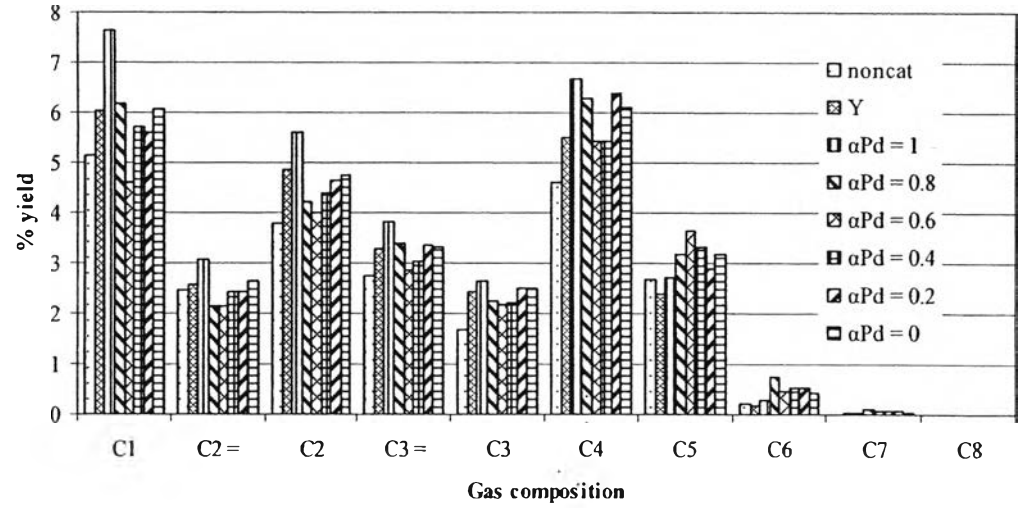

Figure F1 Influence of bimetallic catalysts (Pd-Pt/Y) on gas yields.

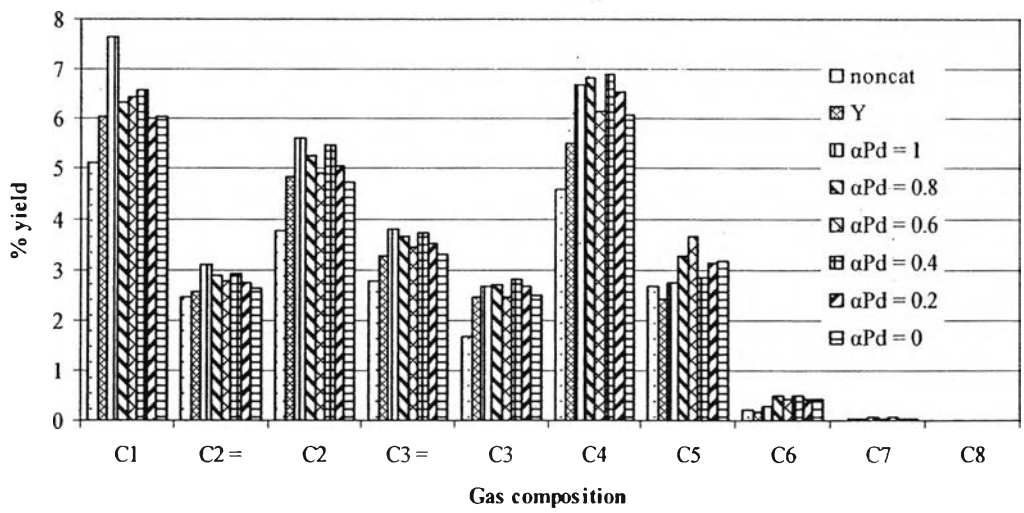

Figure F2 Influence of bimetallic catalysts (Pd*-Pt/Y) on gas yields.

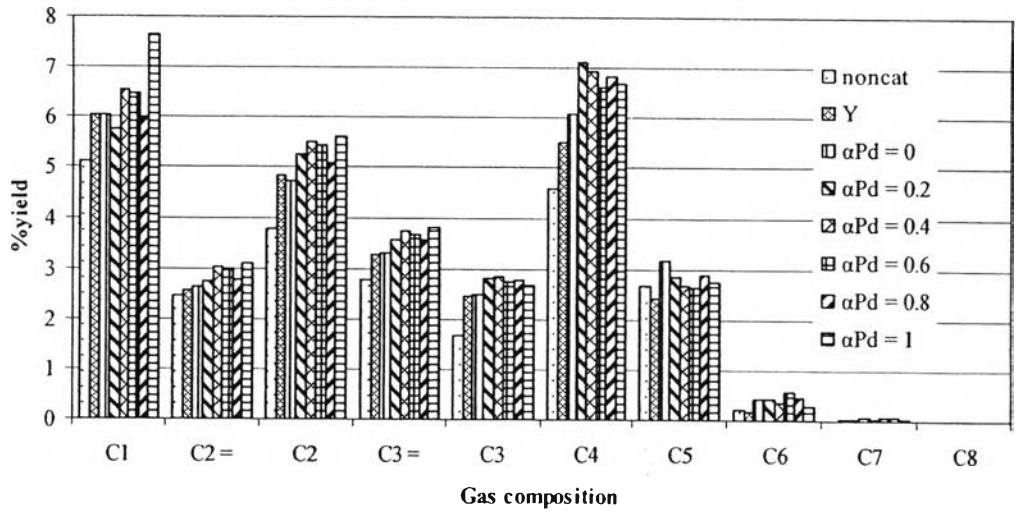

Figure F3 Influence of bimetallic catalysts (Pd-Pt*/Y) on gas yields.

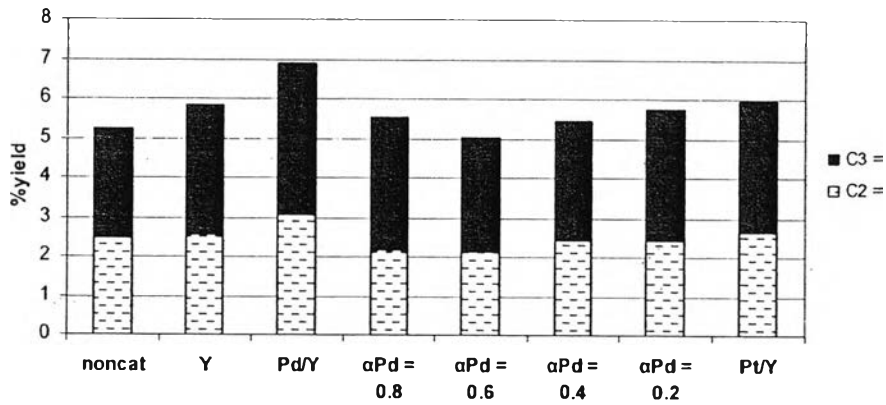

Figure F4 Influence of bimetallic catalysts (Pd-Pt/Y) on light olefins.

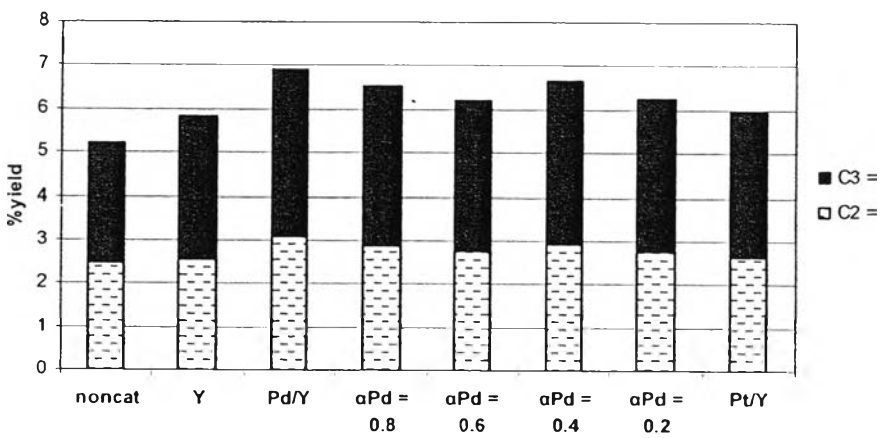

Figure F5 Influence of bimetallic catalysts (Pd*-Pt/Y) on light olefins.

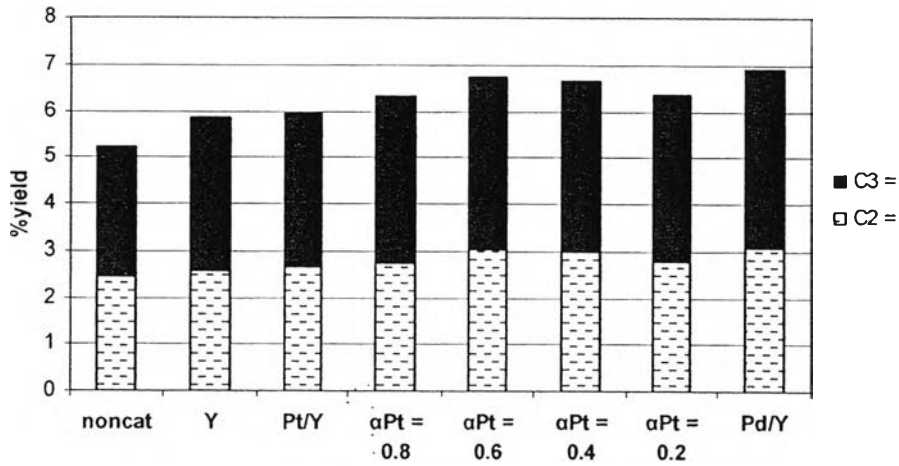

Figure F6 Influence of bimetallic catalysts (Pd-Pt*/Y) on light olefins.

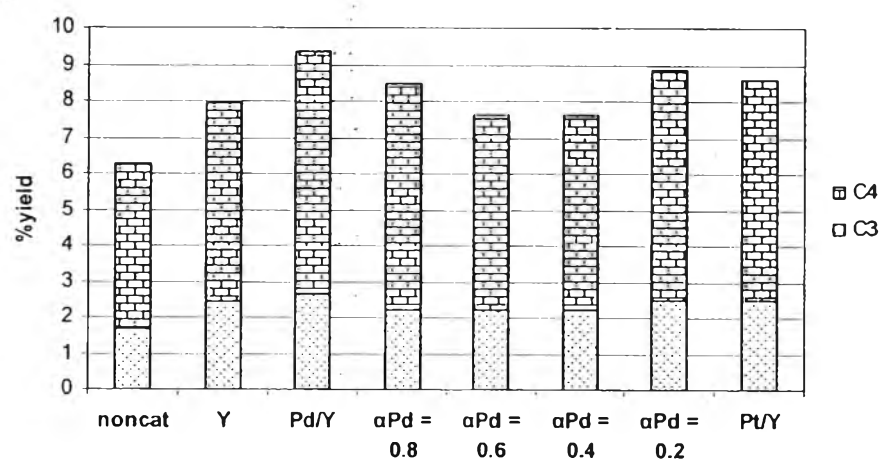

Figure F7 Influence of bimetallic catalysts (Pd-Pt/Y) on LPG yield.

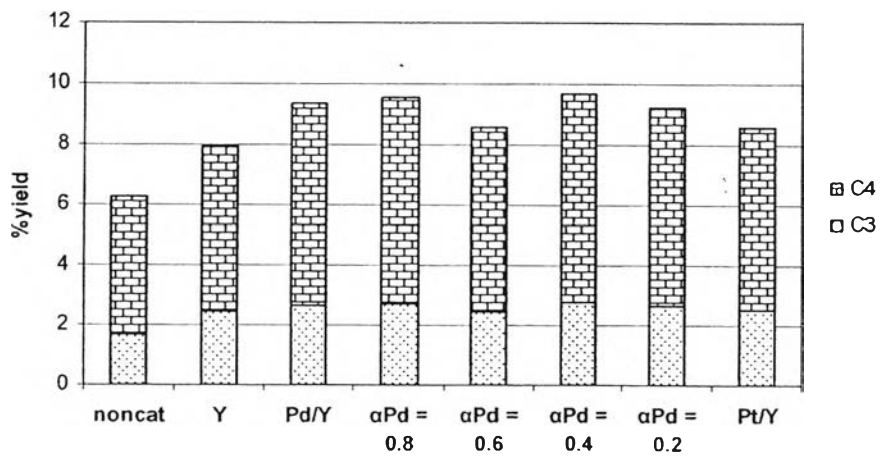

Figure F8 Influence of bimetallic catalysts (Pd*-Pt/Y) on LPG yield.

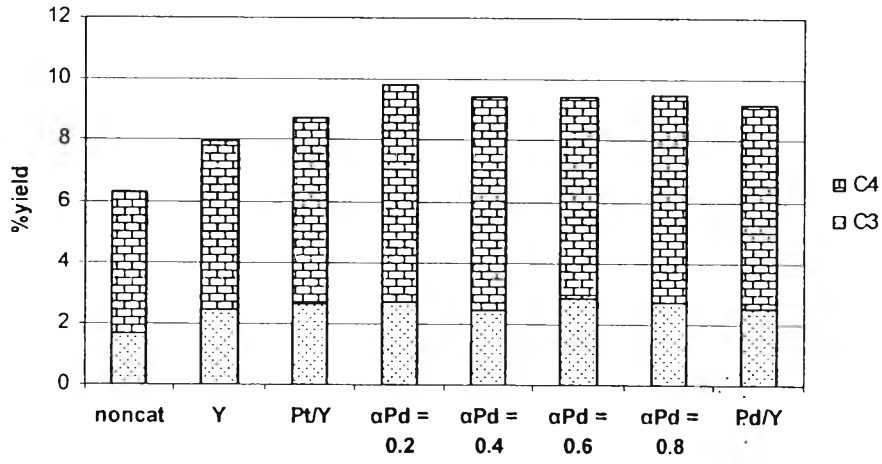

Figure F9 Influence of bimetallic catalysts (Pd-Pt*/Y) on LPG yield.

APPENDIX G

G. The Amount of Metal Loading on The Catalysts

Table G.1 Amounts of Pd and Pt metal loading on the catalyst samples

Sample catalysts	α_{Pd}	Desired amount of metal loading		Actual amount of metal loading	
		Pd (% wt)	Pt (% wt)	Pd (% wt)	Pt (% wt)
Pd/Y	1	1	-	0.9953	-
Pt/Y	0	-	1	-	1.0147
Pd-Pt/Y	0.8	0.8	0.2	0.8002	0.7941
	0.6	0.6	0.4	0.5981	0.6029
	0.4	0.4	0.6	0.4145	0.3971
	0.2	0.2	0.8	0.1986	0.2059
Pd*-Pt/Y	0.8	0.8	0.2	0.7979	0.8088
	0.6	0.6	0.4	0.5993	0.5882
	0.4	0.4	0.6	0.4099	0.3971
	0.2	0.2	0.8	0.2021	0.2059
Pd-Pt*/Y	0.8	0.8	0.2	0.7990	0.7941
	0.6	0.6	0.4	0.6016	0.5882
	0.4	0.4	0.6	0.4053	0.4118
	0.2	0.2	0.8	0.2067	0.1912

APPENDIX H

H. The Amount of Sulfur Deposition on The Catalysts

Table H.1 Amount of sulfur content in oil product and on the catalysts

Catalysts	α_{Pd}	S on the catalyst (ppm)	S in oil product (ppm)
Without catalyst	-	-	9,254
Y	-	5,118	7,585
Pd/Y	1	5,707	7,255
Pt/Y	0	5,827	7,470
Pd-Pt/Y	0.8	5,212	7,032
	0.6	3,633	6,384
	0.4	4,324	6,490
	0.2	4,679	6,891
Pd*-Pt/Y	0.8	4,752	6,946
	0.6	4,651	6,137
	0.4	4,202	6,090
	0.2	4,383	5,916
Pd-Pt*/Y	0.8	3,922	5,999
	0.6	5,356	6,490
	0.4	4,859	6,728
	0.2	2,672	6,051

Sulfur content in tires = 18,537 ppm.

APPENDIX I

I.1 TEM Images and Size Distribution

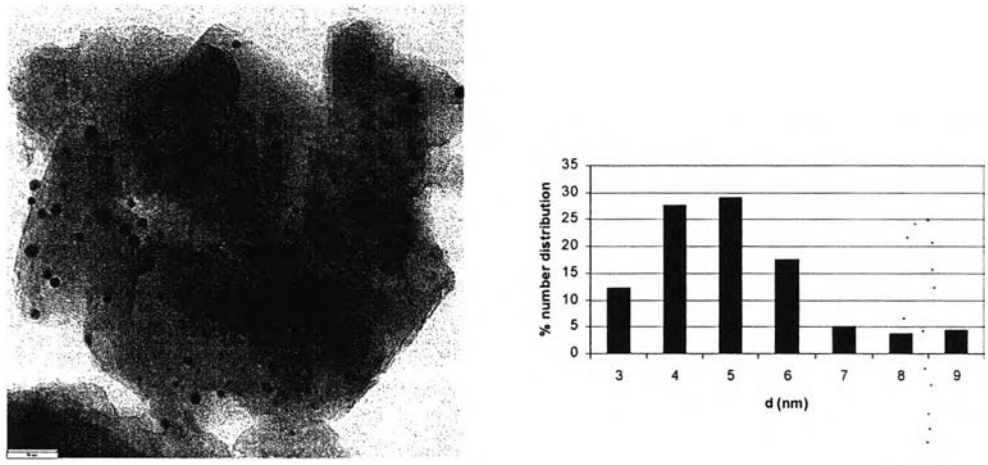

Figure I1 TEM image and size distribution of the Pd/Y catalyst.

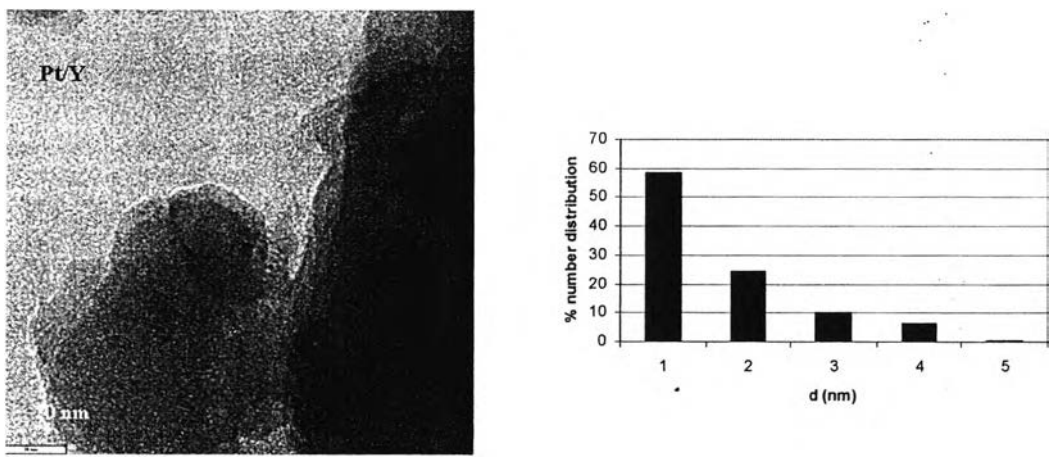

Figure I2 TEM image and size distribution of the Pt/Y catalyst.

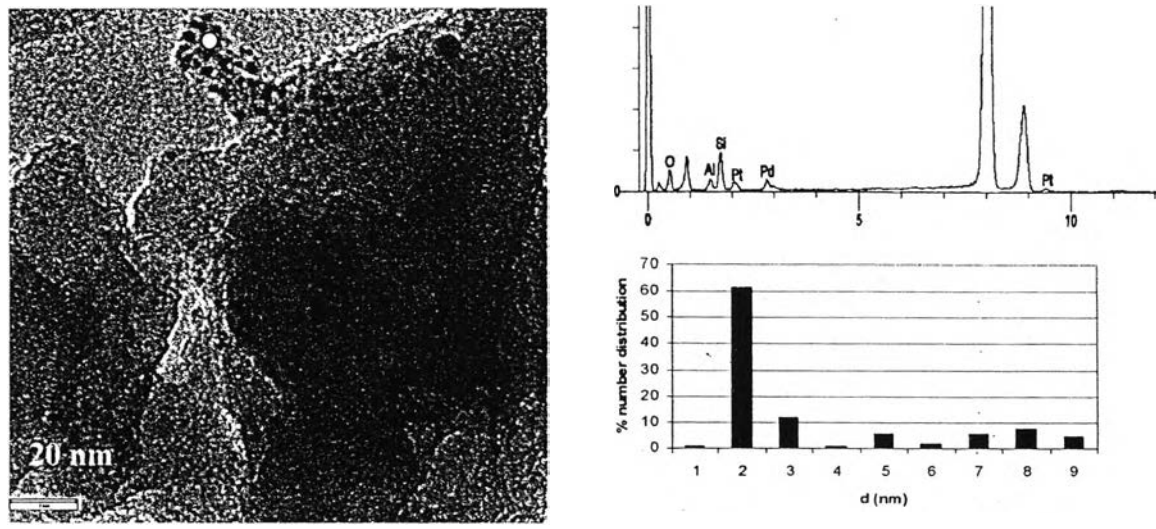

Figure I3 TEM image, size distribution, and metal composition of the Pd-Pt/Y catalyst at $\alpha_{Pd} = 0.2$.

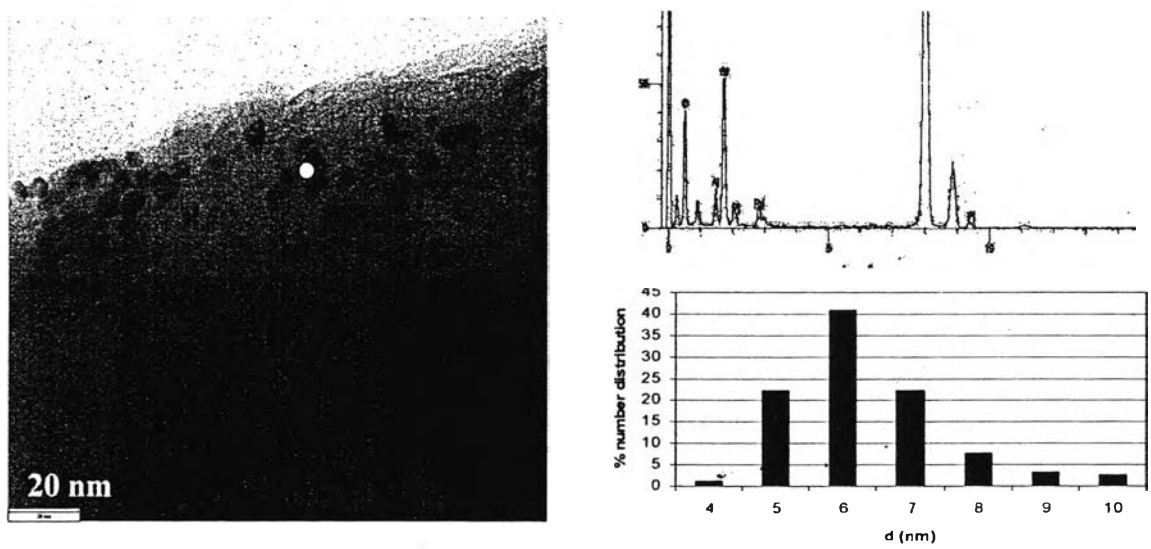

Figure I4 TEM image, size distribution, and metal composition of the Pd-Pt/Y catalyst at $\alpha_{Pd} = 0.4$.

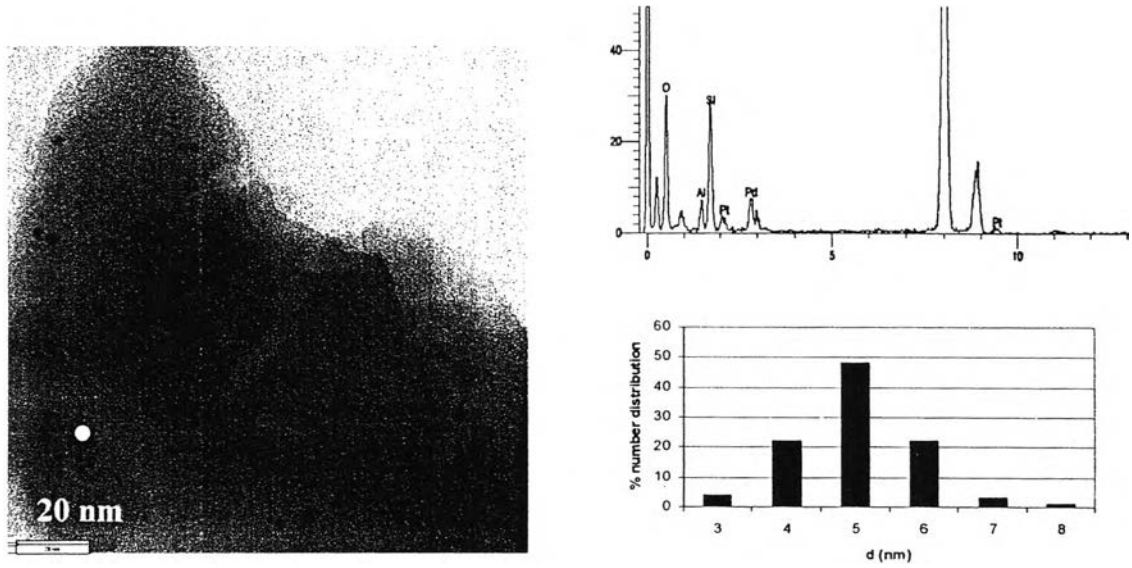

Figure I5 TEM image, size distribution, and metal composition of the Pd-Pt/Y catalyst at $\alpha_{Pd} = 0.6$.

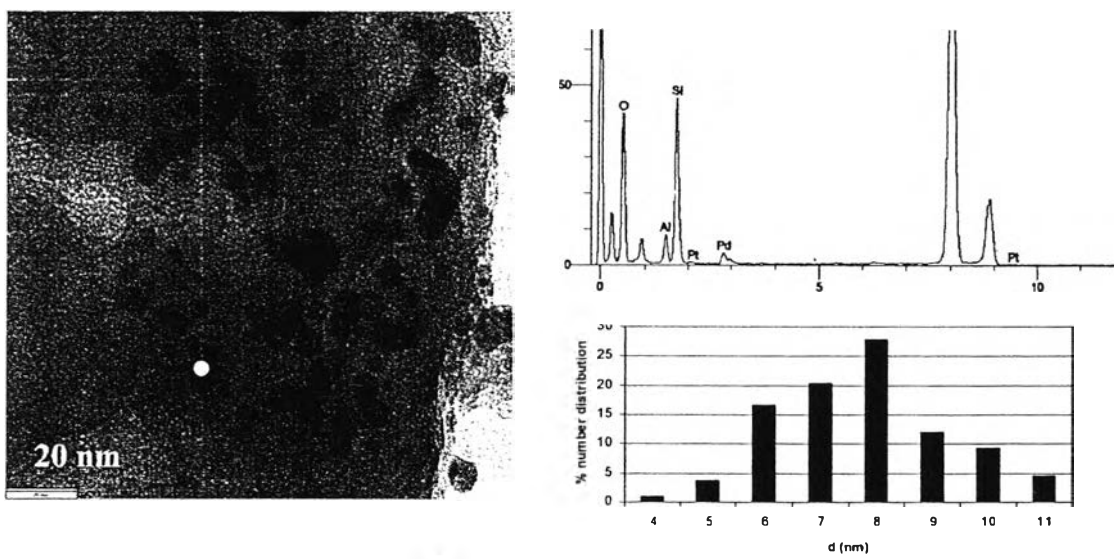

Figure I6 TEM image, size distribution, and metal composition of the Pd-Pt/Y catalyst at $\alpha_{Pd} = 0.8$.

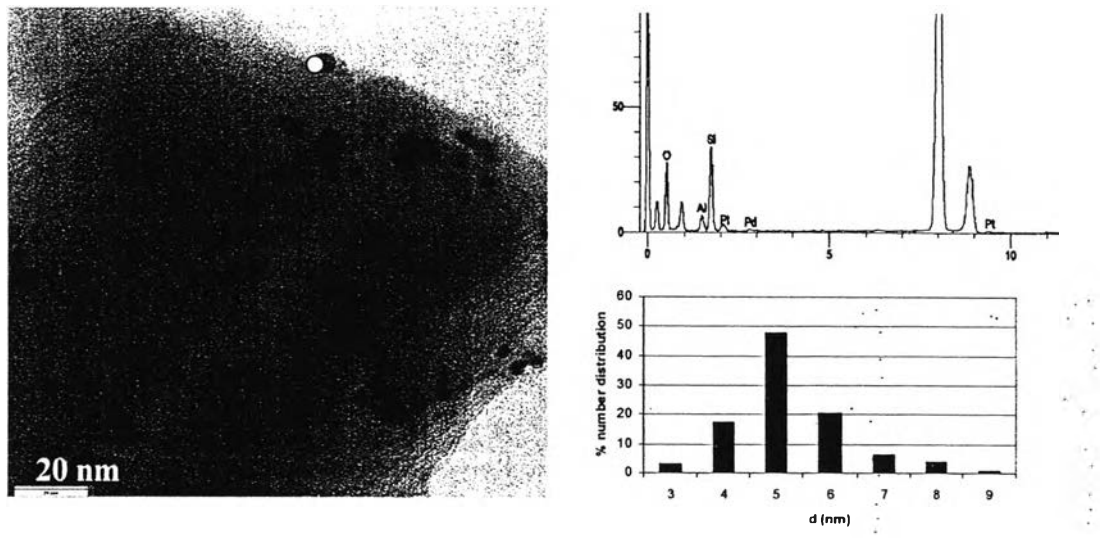

Figure 17 TEM image, size distribution, and metal composition of the Pd*-Pt/Y catalyst at $\alpha_{Pd} = 0.2$.

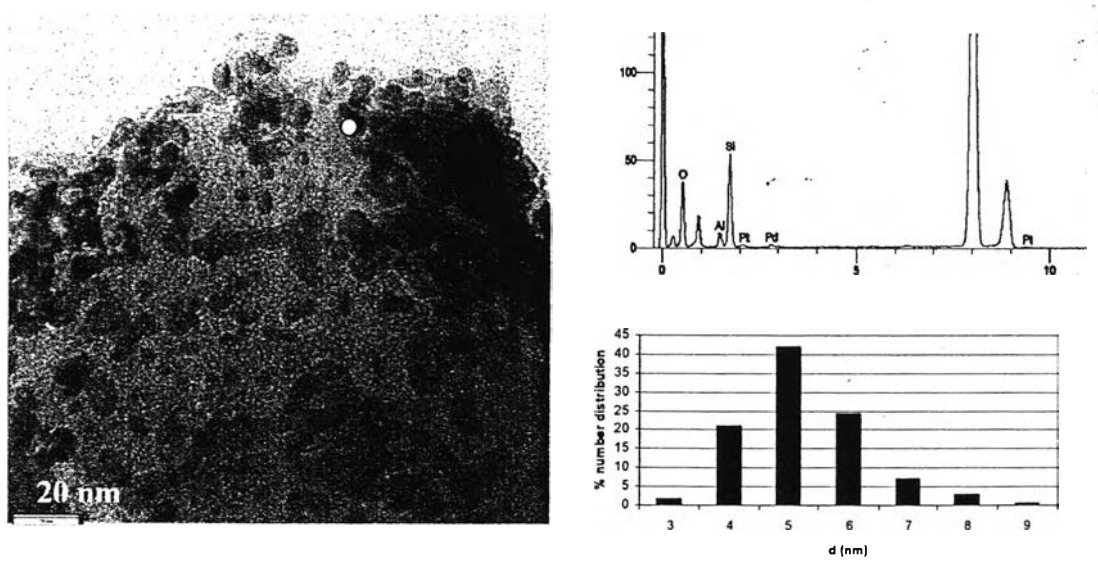

Figure 18 TEM image, size distribution, and metal composition of the Pd*-Pt/Y catalyst at $\alpha_{Pd} = 0.4$.

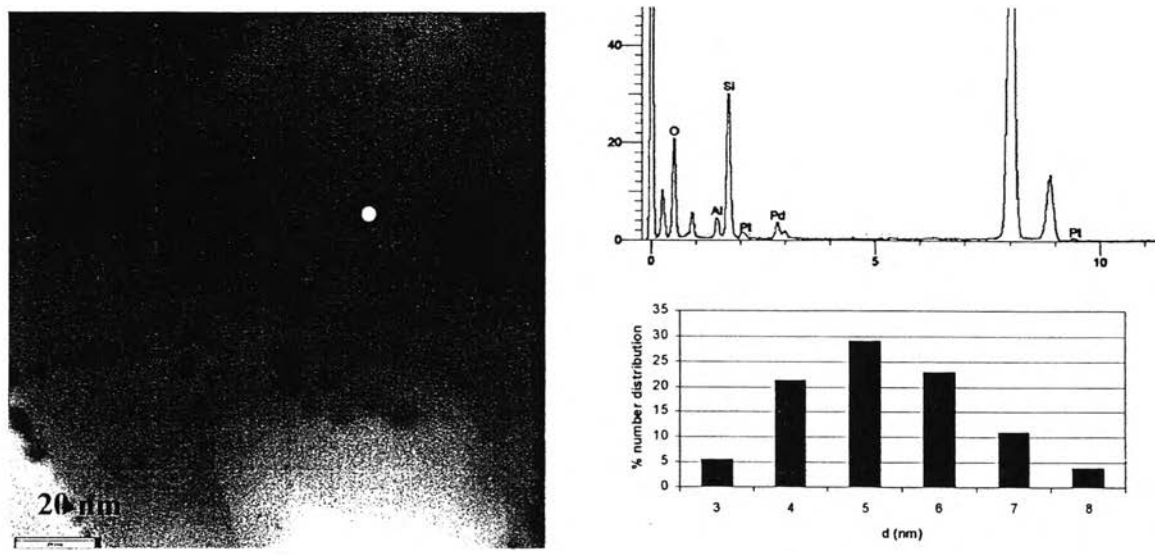

Figure I9 TEM image, size distribution, and metal composition of the Pd*-Pt/Y catalyst at $\alpha_{Pd} = 0.6$.

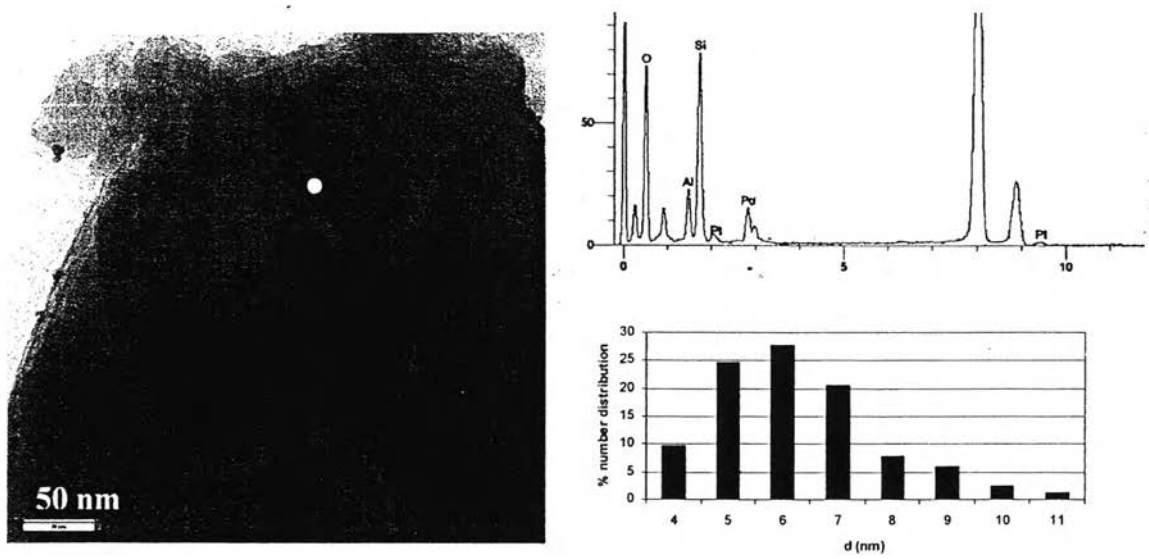

Figure I10 TEM image, size distribution, and metal composition of the Pd*-Pt/Y catalyst at $\alpha_{Pd} = 0.8$.

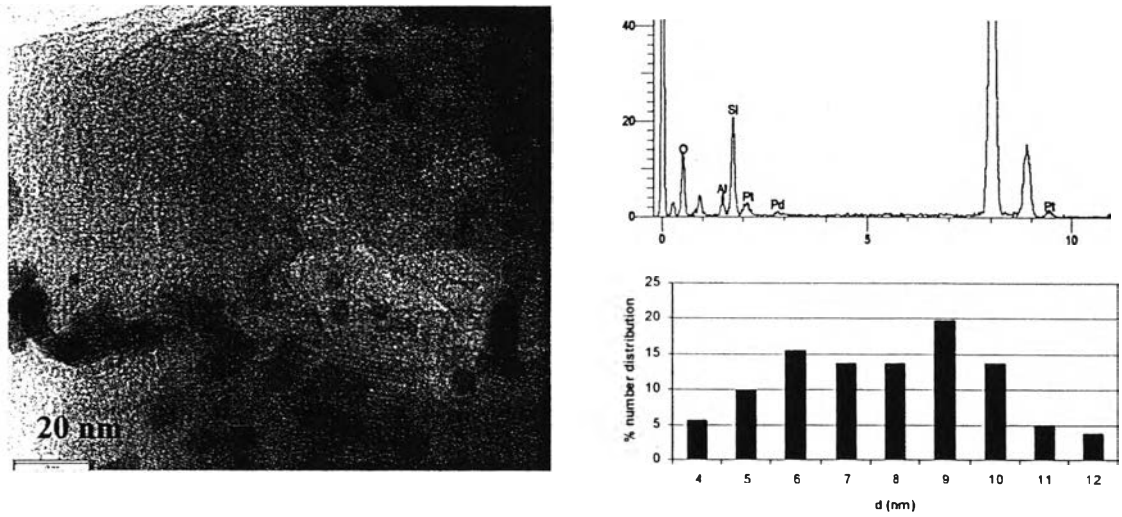

Figure I11 TEM image, size distribution, and metal composition of the Pd-Pt*/Y catalyst at $\alpha_{Pd} = 0.4$.

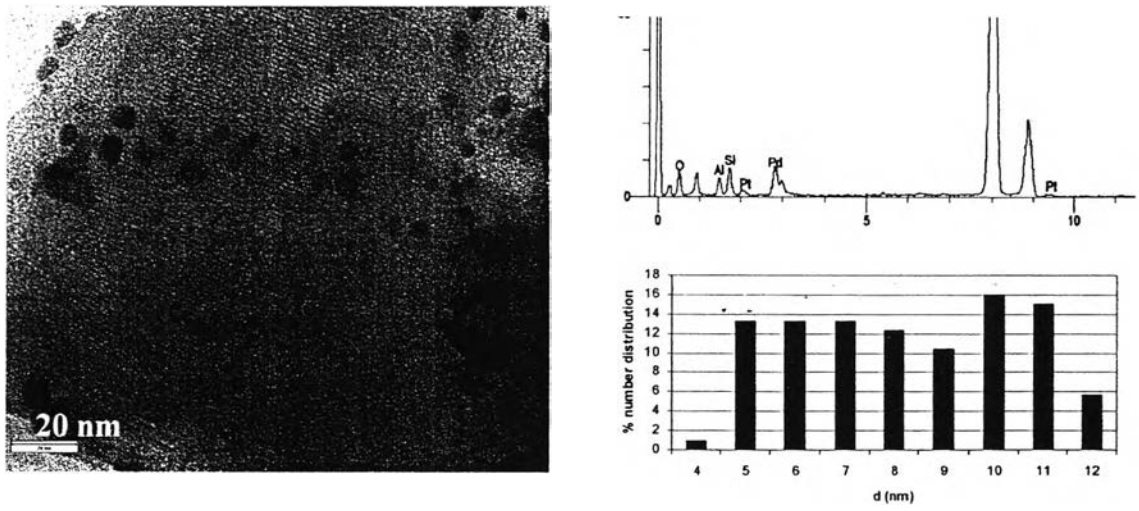

Figure I12 TEM image, size distribution, and metal composition of the Pd-Pt*/Y catalyst at $\alpha_{Pd} = 0.6$.

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