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APPENDICES

Appendix A Operating Temperatures

Table A1 Pyrolysis conditions: Non-catalytic Pyrolysis

Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	27.0	27.0	32	376.0	501.0	62	357.0	495.0	92	357.0	505.0
4	35.0	41.0	34	376.0	502.0	64	362.0	507.0	94	356.0	498.0
6	54.0	68.0	36	375.0	501.0	66	360.0	506.0	96	354.0	507.0
8	73.0	98.0	38	374.0	496.0	68	357.0	499.0	98	352.0	502.0
10	104.0	144.0	40	377.0	503.0	70	353.0	506.0	100	354.0	503.0
12	140.0	192.0	42	374.0	500.0	72	352.0	500.0	102	352.0	504.0
14	181.0	248.0	44	377.0	501.0	74	356.0	500.0	104	349.0	499.0
16	220.0	301.0	46	375.0	504.0	76	348.0	500.0	106	355.0	504.0
18	285.0	383.0	48	372.0	498.0	78	350.0	504.0	108	352.0	495.0
20	323.0	413.0	50	374.0	510.0	80	355.0	496.0	110	353.0	507.0
22	320.0	462.0	52	371.0	502.0	82	358.0	507.0	112	353.0	498.0
24	345.0	513.0	54	372.0	504.0	84	353.0	497.0	114	354.0	507.0
26	368.0	478.0	56	370.0	505.0	86	356.0	506.0	116	351.0	499.0
28	376.0	516.0	58	363.0	498.0	88	350.0	502.0	118	349.0	506.0
30	375.0	510.0	60	367.0	503.0	90	354.0	496.0	120	351.0	504.0

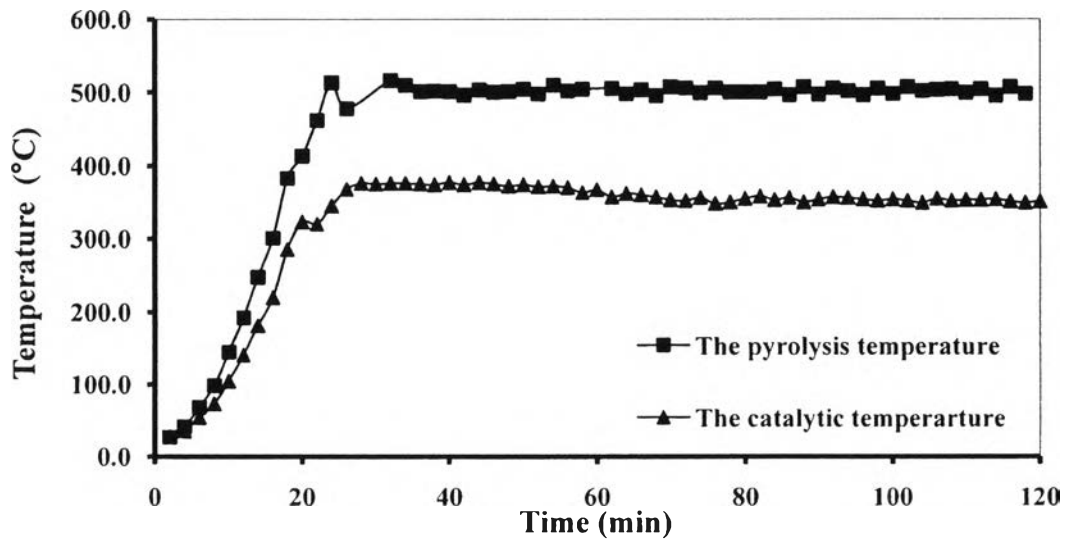


Figure A1 Operating temperatures vs time on stream of non-catalytic pyrolysis.

Table A2 Pyrolysis conditions: Bentonite ClayTire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	30.0	31.0	32	367.0	505.0	62	355.0	505.0	92	356.0	498.0
4	39.0	43.0	34	368.0	498.0	64	354.0	500.0	94	351.0	499.0
6	59.0	72.0	36	368.0	503.0	66	354.0	502.0	96	351.0	502.0
8	88.0	114.0	38	369.0	499.0	68	352.0	499.0	98	349.0	499.0
10	116.0	153.0	40	370.0	503.0	70	351.0	499.0	100	353.0	503.0
12	147.0	197.0	42	370.0	502.0	72	350.0	502.0	102	353.0	504.0
14	190.0	256.0	44	369.0	499.0	74	350.0	497.0	104	353.0	503.0
16	235.0	310.0	46	369.0	499.0	76	353.0	506.0	106	352.0	506.0
18	282.0	389.0	48	368.0	501.0	78	355.0	502.0	108	351.0	498.0
20	320.0	434.0	50	367.0	504.0	80	353.0	505.0	110	350.0	505.0
22	313.0	480.0	52	364.0	496.0	82	352.0	498.0	112	349.0	503.0
24	330.0	511.0	54	364.0	505.0	84	352.0	499.0	114	355.0	505.0
26	341.0	504.0	56	362.0	497.0	86	350.0	503.0	116	353.0	502.0
28	352.0	502.0	58	360.0	504.0	88	348.0	502.0	118	353.0	502.0
30	364.0	501.0	60	358.0	502.0	90	353.0	500.0	120	352.0	499.0

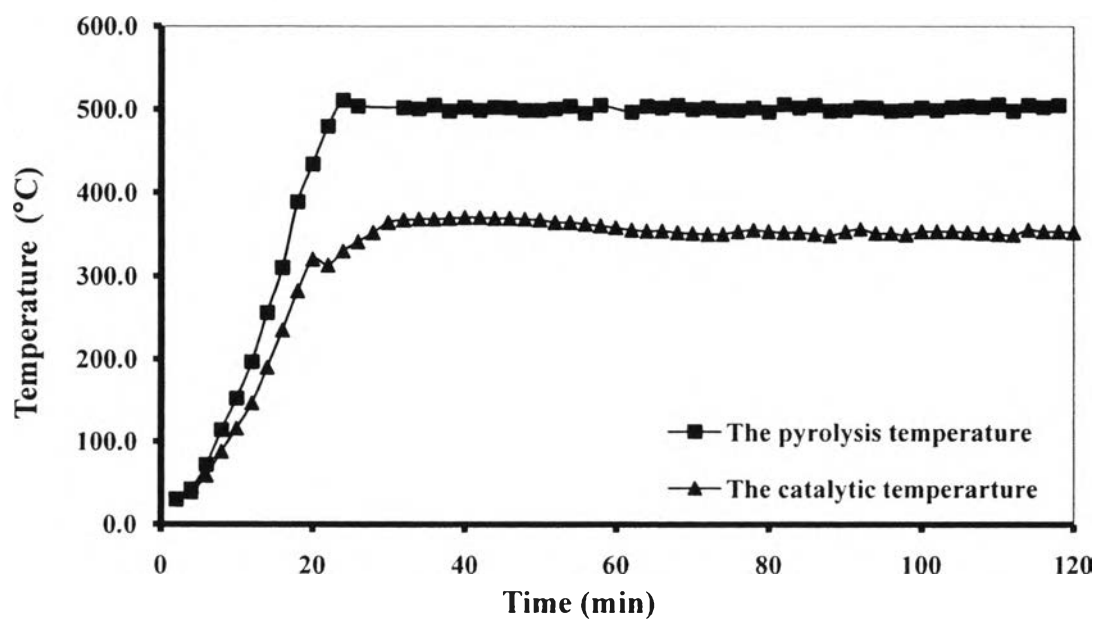
**Figure A2** Operating temperatures vs time on stream of Bentonite Clay.

Table A3 Pyrolysis conditions: Ball ClayTire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	30.0	32.0	32	375.0	497.0	62	352.0	499.0	92	353.0	500.0
4	39.0	45.0	34	375.0	506.0	64	348.0	493.0	94	350.0	506.0
6	62.0	78.0	36	375.0	499.0	66	355.0	505.0	96	353.0	498.0
8	92.0	120.0	38	374.0	503.0	68	355.0	497.0	98	350.0	498.0
10	128.0	170.0	40	372.0	495.0	70	354.0	505.0	100	356.0	496.0
12	170.0	227.0	42	371.0	505.0	72	350.0	496.0	102	357.0	502.0
14	222.0	291.0	44	370.0	498.0	74	356.0	504.0	104	353.0	506.0
16	270.0	368.0	46	368.0	503.0	76	355.0	499.0	106	351.0	502.0
18	313.0	424.0	48	366.0	501.0	78	356.0	505.0	108	353.0	507.0
20	321.0	472.0	50	364.0	501.0	80	348.0	501.0	110	358.0	505.0
22	325.0	508.0	52	361.0	497.0	82	351.0	498.0	112	356.0	506.0
24	332.0	501.0	54	359.0	503.0	84	358.0	502.0	114	356.0	505.0
26	339.0	504.0	56	355.0	498.0	86	356.0	501.0	116	353.0	500.0
28	364.0	497.0	58	353.0	502.0	88	354.0	494.0	118	350.0	504.0
30	369.0	505.0	60	352.0	501.0	90	356.0	506.0	120	355.0	501.0

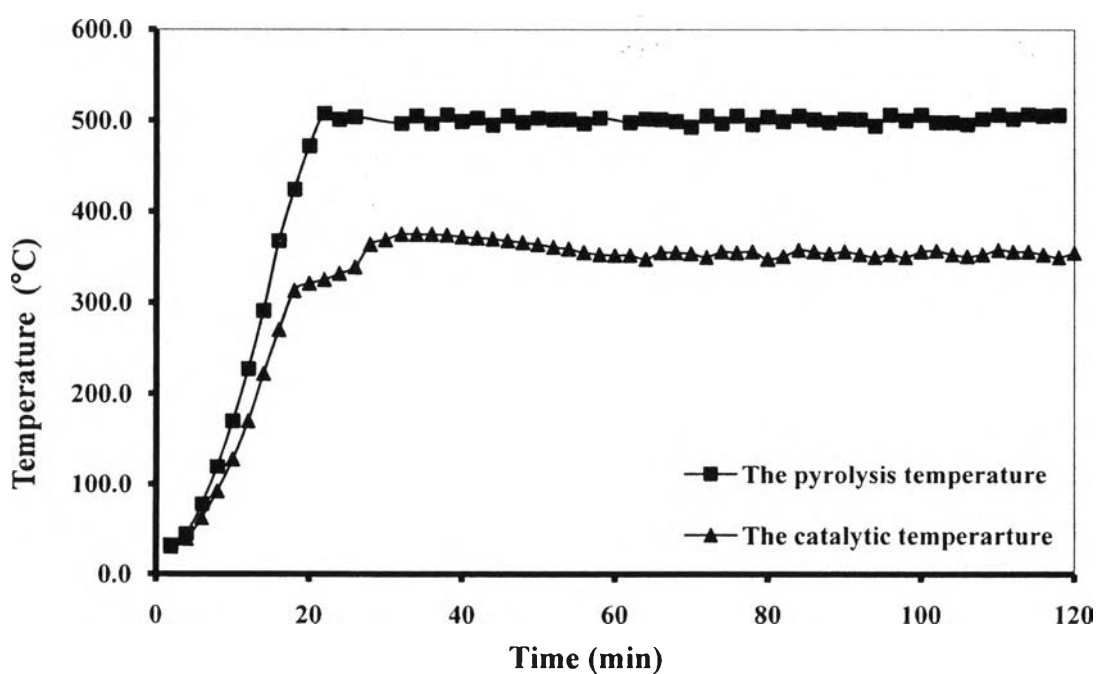
**Figure A3** Operating temperatures vs time on stream of Ball Clay.

Table A4 Pyrolysis conditions: Pd/Beta 13.5 Pure Active (0.25 wt.% Pd)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.0	37.0	32	366.0	500.0	62	356.0	500.0	92	352	500
4	37.0	47.0	34	365.0	500.0	64	358.0	500.0	94	351.0	500
6	53.0	72.0	36	363.0	500.0	66	354.0	500.0	96	353.0	500
8	80.0	115.0	38	365.0	500.0	68	352.0	500.0	98	355.0	500
10	109.0	158.0	40	360.0	500.0	70	352.0	500.0	100	356.0	500
12	192.0	274.0	42	361.0	500.0	72	354.0	500.0	102	352.0	500
14	239.0	333.0	44	361.0	500.0	74	355.0	500.0	104	351.0	500
16	290.0	404.0	46	358.0	500.0	76	357.0	500.0	106	354.0	500
18	340.0	442.0	48	354.0	500.0	78	352.0	500.0	108	352.0	500
20	349.0	495.0	50	351.0	500.0	80	351.0	500.0	110	350.0	500
22	355.0	500.0	52	349.0	500.0	82	350.0	500.0	112	348.0	500
24	352.0	513.2	54	346.0	500.0	84	348.0	500.0	114	344.0	500
26	350.0	504.0	56	351.0	500.0	86	349.0	500.0	116	349.0	500
28	356.0	500.0	58	357.0	500.0	88	350.0	500.0	118	352.0	500
30	364.0	496.0	60	361.0	500.0	90	352	500.0	120	355.0	500

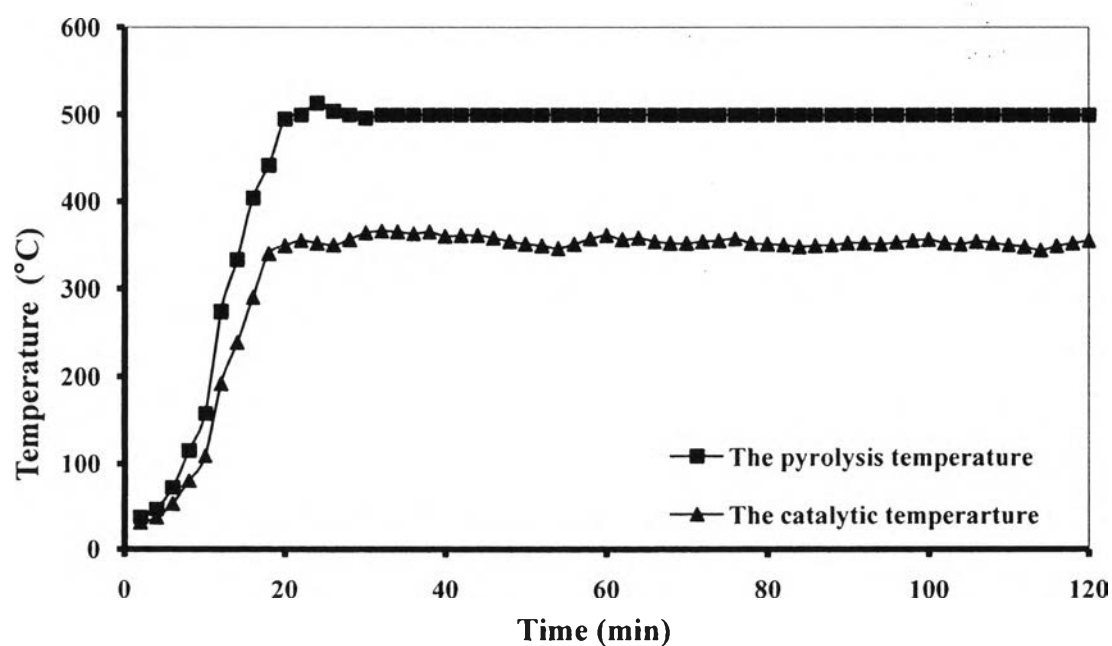
**Figure A4** Operating temperatures vs time on stream of Pd/Beta 13.5 Pure Active (0.25 Wt.% Pd).

Table A5 Pyrolysis conditions: Pd/Beta 250 Pure Active (0.25 wt.% Pd)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	32.0	32.0	32	359.0	502.0	62	350	500	92	350	500
4	45.0	51.0	34	359.0	502.9	64	350	500	94	350	500
6	66.0	88.0	36	357.0	504.8	66	350	500	96	350	500
8	96.0	127.0	38	355.0	502.6	68	350	500	98	350	500
10	130.0	174.0	40	354.0	492.0	70	350	500	100	350	500
12	171.0	230.0	42	352.0	499.7	72	350	500	102	350	500
14	220.0	293.0	44	351.0	499.8	74	350	500	104	350	500
16	270.0	350.0	46	353.0	500.3	76	350	500	106	350	500
18	320.0	418.0	48	354.0	501.4	78	350	500	108	350	500
20	359.0	455.0	50	354.2	494.0	80	350	500	110	350	500
22	339.0	498.0	52	352.0	506.7	82	350	500	112	350	500
24	342.0	504.0	54	355.0	500.3	84	350	500	114	350	500
26	342.0	501.0	56	351.0	506.5	86	350	500	116	350	500
28	347.0	498.0	58	353.0	496.4	88	350	500	118	350	500
30	356.0	505.0	60	352.0	506.1	90	350	500	120	350	500

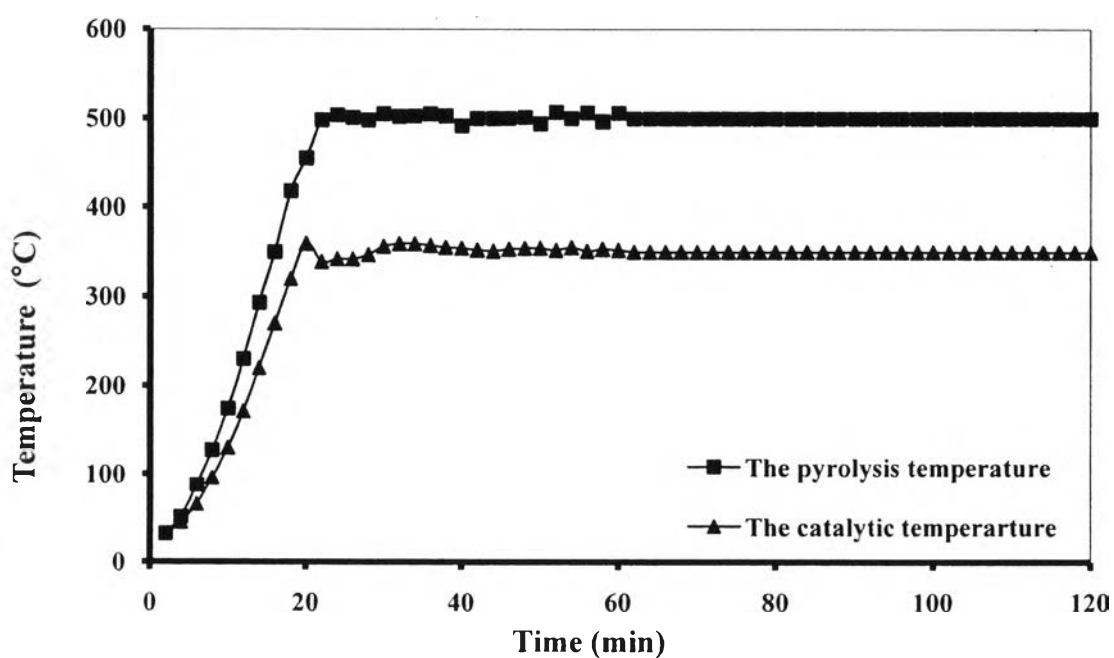
**Figure A5** Operating temperatures vs time on stream of Pd/Beta 250 Pure Active (0.25 Wt.% Pd).

Table A6 Pyrolysis conditions: Pd/Beta 13.5 with Bentonite (5% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.0	31.0	32	351.0	504.0	62	361.0	500.0	92	361.0	500.0
4	41.0	51.0	34	366.0	500.0	64	366.0	500.0	94	361.0	500.0
6	60.0	81.0	36	368.0	495.0	66	361.0	500.0	96	359.0	500.0
8	88.0	116.0	38	370.0	499.0	68	362.0	500.0	98	358.0	500.0
10	124.0	164.0	40	370.0	499.0	70	361.0	500.0	100	358.0	500.0
12	164.0	215.0	42	370.0	500.0	72	361.0	500.0	102	356.0	500.0
14	215.0	278.0	44	371.0	500.0	74	360.0	500.0	104	356.0	500.0
16	271.0	338.0	46	367.0	500.0	76	360.0	500.0	106	353.0	500.0
18	297.0	412.0	48	366.0	500.0	78	361.0	500.0	108	356.0	500.0
20	308.0	453.0	50	366.0	500.0	80	360.0	500.0	110	355.0	500.0
22	315.0	491.0	52	364.0	500.0	82	361.0	500.0	112	356.0	500.0
24	326.0	503.0	54	362.0	500.0	84	360.0	500.0	114	352.0	500.0
26	331.0	504.0	56	361.0	500.0	86	360.0	500.0	116	353.0	500.0
28	338.0	495.0	58	360.0	500.0	88	360.0	500.0	118	354.0	500.0
30	345.0	500.0	60	360.0	500.0	90	360.0	500.0	120	356.0	500.0

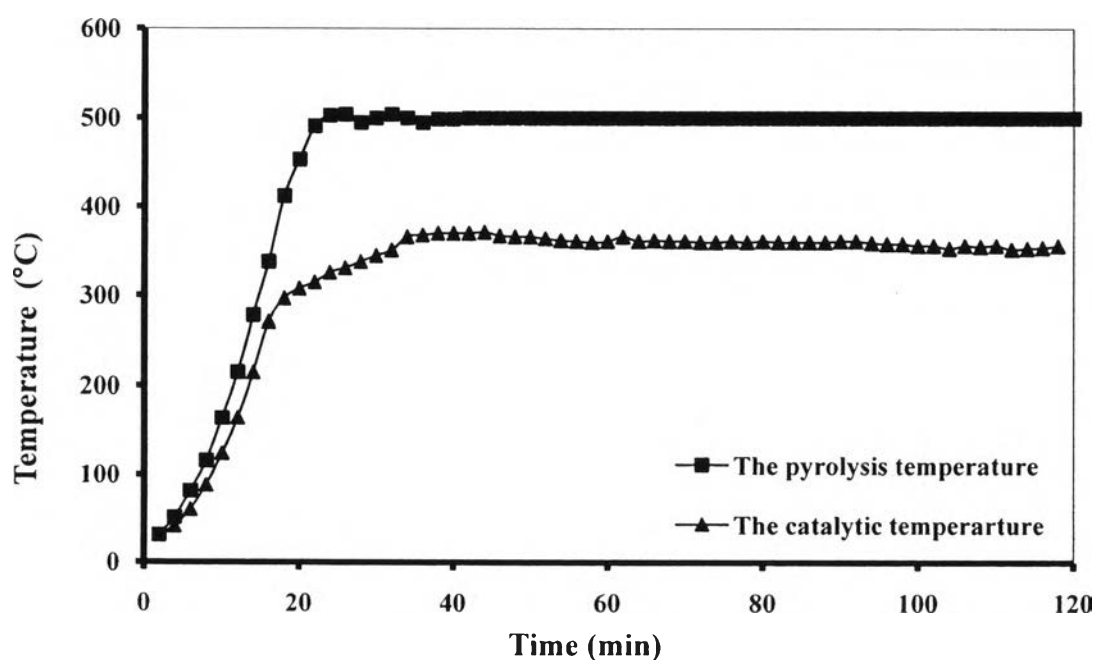
**Figure A6** Operating temperatures vs time on stream of Pd/Beta 13.5 on Bentonite (5% Active).

Table A7 Pyrolysis conditions: Pd/Beta 13.5 with Bentonite (20% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	33.0	32.0	32	371.0	499.0	62	359.0	500.0	92	354.0	500.0
4	44.0	47.0	34	373.0	501.0	64	358.0	500.0	94	352.0	500.0
6	62.0	72.0	36	373.0	498.0	66	356.0	500.0	96	350.0	500.0
8	90.0	110.0	38	374.0	499.0	68	351.0	500.0	98	351.0	500.0
10	127.0	157.0	40	375.0	499.0	70	351.0	500.0	100	354.0	500.0
12	166.0	209.0	42	375.0	500.0	72	352.0	500.0	102	352.0	500.0
14	211.0	264.0	44	374.0	499.0	74	356.0	500.0	104	353.0	500.0
16	283.0	372.0	46	372.0	501.0	76	357.0	500.0	106	352.0	500.0
18	312.0	427.0	48	371.0	500.0	78	356.0	500.0	108	353.0	500.0
20	322.0	492.0	50	368.0	498.0	80	356.0	500.0	110	351.0	500.0
22	345.0	504.0	52	365.0	500.0	82	354.0	500.0	112	352.0	500.0
24	354.0	502.0	54	364.0	499.0	84	352.0	500.0	114	354.0	500.0
26	359.0	498.0	56	365.0	500.0	86	350.0	500.0	116	356.0	500.0
28	363.0	501.0	58	361.0	500.0	88	349.0	500.0	118	356.0	500.0
30	368.0	498.0	60	361.0	500.0	90	351.0	500.0	120	352.0	500.0

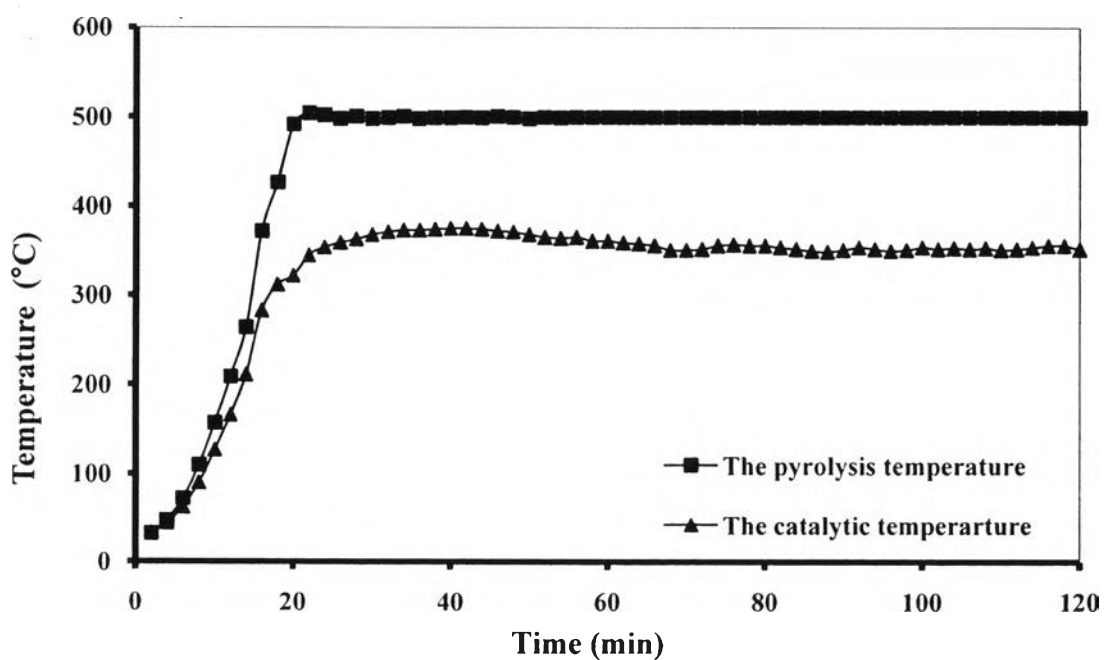
**Figure A7** Operating temperatures vs time on stream of Pd/Beta 13.5 on Bentonite (20% Active).

Table A8 Pyrolysis conditions: Pd/Beta 13.5 with Bentonite (40% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	30.0	30.0	32	356.0	496.0	62	360.0	500.0	92	356.0	500.0
4	40.0	46.0	34	356.0	500.0	64	358.0	500.0	94	356.0	500.0
6	58.0	73.0	36	354.0	499.0	66	357.0	500.0	96	356.0	500.0
8	84.0	112.0	38	355.0	500.0	68	354.0	500.0	98	356.0	500.0
10	117.0	159.0	40	356.0	499.0	70	353.0	500.0	100	356.0	500.0
12	155.0	171.0	42	355.0	499.0	72	353.0	500.0	102	356.0	500.0
14	200.0	269.0	44	359.0	500.0	74	354.0	500.0	104	356.0	500.0
16	249.0	338.0	46	364.0	499.0	76	354.0	500.0	106	356.0	500.0
18	305.0	398.0	48	363.0	501.0	78	355.0	500.0	108	356.0	500.0
20	310.0	433.0	50	361.0	500.0	80	356.0	500.0	110	356.0	500.0
22	319.0	489.0	52	359.0	499.0	82	355.0	500.0	112	356.0	500.0
24	327.0	503.0	54	357.0	499.0	84	355.0	500.0	114	356.0	500.0
26	336.0	503.0	56	356.0	500.0	86	356.0	500.0	116	356.0	500.0
28	344.0	499.0	58	363.0	500.0	88	355.0	500.0	118	356.0	500.0
30	352.0	497.0	60	362.0	500.0	90	355.0	500.0	120	356.0	500.0

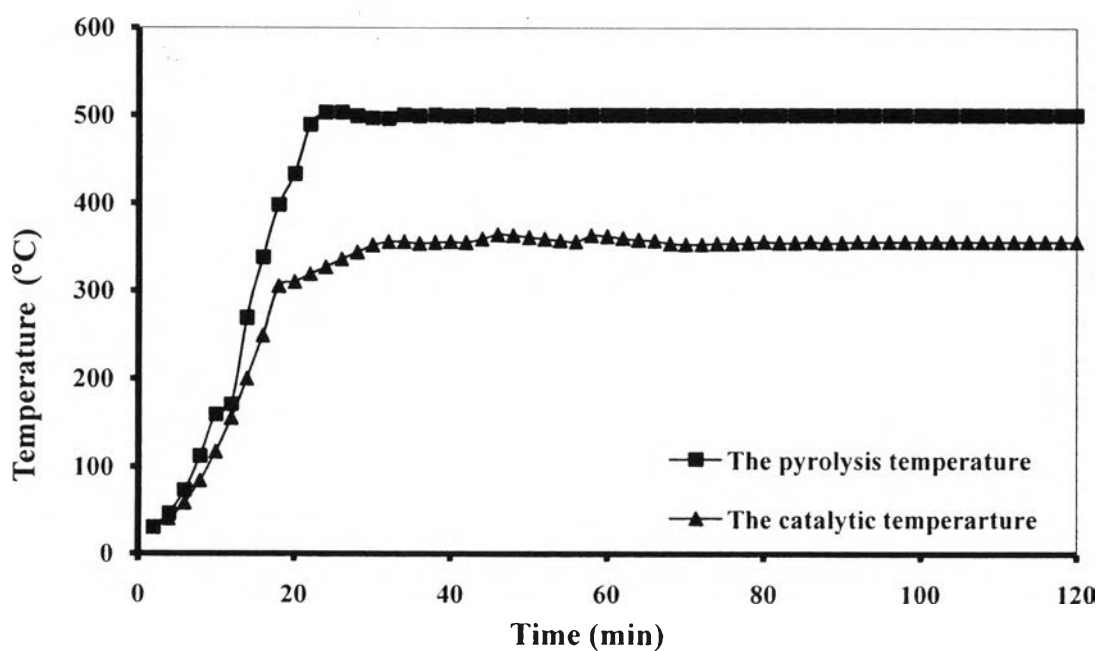
**Figure A8** Operating temperatures vs time on stream of Pd/Beta 13.5 on Bentonite (40% Active).

Table A9 Pyrolysis conditions: Pd/Beta 250 with Bentonite (5% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	30.0	29.0	32	345.0	496.0	62	353.0	500.0	92	353.0	500.0
4	41.0	46.0	34	348.0	500.0	64	351.0	500.0	94	352.0	500.0
6	61.0	75.0	36	351.0	500.0	66	349.0	500.0	96	351.0	500.0
8	90.0	117.0	38	352.0	500.0	68	351.0	500.0	98	354.0	500.0
10	125.0	116.0	40	352.0	500.0	70	356.0	500.0	100	355.0	500.0
12	168.0	223.0	42	351.0	500.0	72	357.0	500.0	102	356.0	500.0
14	219.0	282.0	44	352.0	500.0	74	356.0	500.0	104	357.0	500.0
16	265.0	358.0	46	352.0	500.0	76	354.0	500.0	106	356.0	500.0
18	319.0	420.0	48	352.0	500.0	78	349.0	500.0	108	353.0	500.0
20	312.0	452.0	50	349.0	500.0	80	351.0	500.0	110	357.0	500.0
22	319.0	495.0	52	358.0	500.0	82	353.0	500.0	112	351.0	500.0
24	325.0	498.0	54	359.0	500.0	84	354.0	500.0	114	353.0	500.0
26	332.0	498.0	56	358.0	500.0	86	352.0	500.0	116	354.0	500.0
28	337.0	503.0	58	356.0	500.0	88	350.0	500.0	118	355.0	500.0
30	344.0	494.0	60	354.0	500.0	90	351.0	500.0	120	350.0	500.0

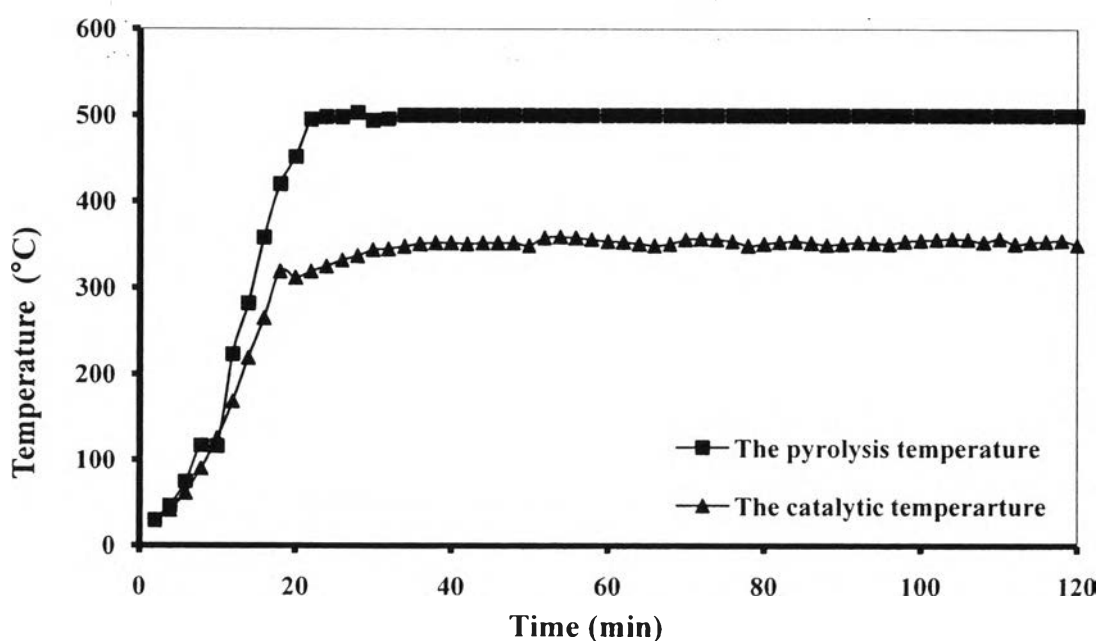
**Figure A9** Operating temperatures vs time on stream of Pd/Beta 250 on Bentonite (5% Active).

Table A10 Pyrolysis conditions: Pd/Beta 250 with Bentonite (20% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	35.0	30.0	32	359.0	495.0	62	356.0	500.0	92	357.0	500.0
4	45.0	38.0	34	364.0	499.0	64	355.0	500.0	94	356.0	500.0
6	64.0	58.0	36	368.0	498.0	66	355.0	500.0	96	355.0	500.0
8	91.0	91.0	38	368.0	501.0	68	354.0	500.0	98	356.0	500.0
10	122.0	132.0	40	367.0	498.0	70	361.0	500.0	100	358.0	500.0
12	165.0	185.0	42	367.0	500.0	72	364.0	500.0	102	360.0	500.0
14	210.0	242.0	44	366.0	500.0	74	360.0	500.0	104	359.0	500.0
16	257.0	300.0	46	366.0	500.0	76	359.0	500.0	106	358.0	500.0
18	300.0	360.0	48	365.0	500.0	78	361.0	500.0	108	356.0	500.0
20	324.0	430.0	50	363.0	500.0	80	362.0	500.0	110	358.0	500.0
22	317.0	466.0	52	361.0	500.0	82	359.0	500.0	112	360.0	500.0
24	330.0	504.0	54	359.0	500.0	84	357.0	500.0	114	361.0	500.0
26	338.0	498.0	56	358.0	500.0	86	361.0	500.0	116	357.0	500.0
28	344.0	499.0	58	357.0	500.0	88	360.0	500.0	118	354.0	500.0
30	352.0	500.0	60	358.0	500.0	90	359.0	500.0	120	355.0	500.0

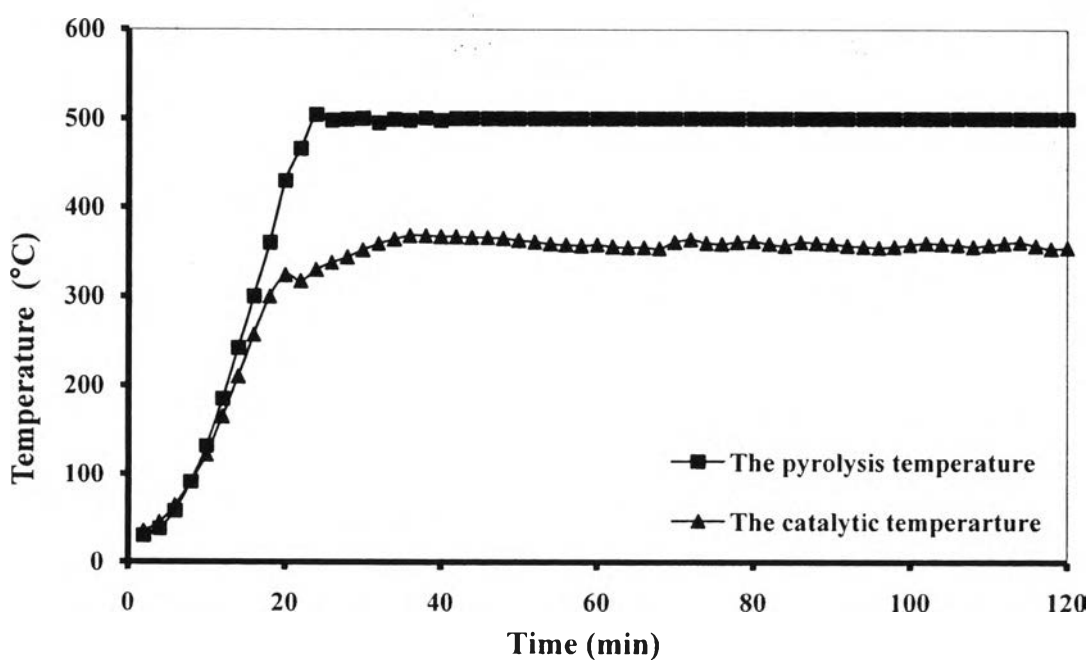
**Figure A10** Operating temperatures vs time on stream of Pd/Beta 250 on Bentonite (20% Active).

Table A11 Pyrolysis conditions: Pd/Beta 250 with Bentonite (40% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	29.0	28.0	32	362.0	501.0	62	360.0	500.0	92	355.0	500.0
4	38.0	42.0	34	365.0	496.0	64	363.0	500.0	94	356.0	500.0
6	57.0	69.0	36	367.0	498.0	66	360.0	500.0	96	355.0	500.0
8	83.0	109.0	38	367.0	499.0	68	361.0	500.0	98	355.0	500.0
10	115.0	157.0	40	367.0	500.0	70	362.0	500.0	100	355.0	500.0
12	153.0	212.0	42	366.0	500.0	72	360.0	500.0	102	356.0	500.0
14	193.0	271.0	44	367.0	499.0	74	357.0	500.0	104	355.0	500.0
16	235.0	321.0	46	365.0	499.0	76	358.0	500.0	106	355.0	500.0
18	298.0	407.0	48	365.0	499.0	78	360.0	500.0	108	356.0	500.0
20	324.0	448.0	50	364.0	499.0	80	360.0	500.0	110	355.0	500.0
22	337.0	489.0	52	362.0	500.0	82	361.0	500.0	112	355.0	500.0
24	349.0	508.0	54	362.0	500.0	84	360.0	500.0	114	355.0	500.0
26	354.0	498.0	56	360.0	500.0	86	357.0	500.0	116	353.0	500.0
28	359.0	503.0	58	363.0	500.0	88	358.0	500.0	118	355.0	500.0
30	360.0	498.0	60	361.0	500.0	90	356.0	500.0	120	354.0	500.0

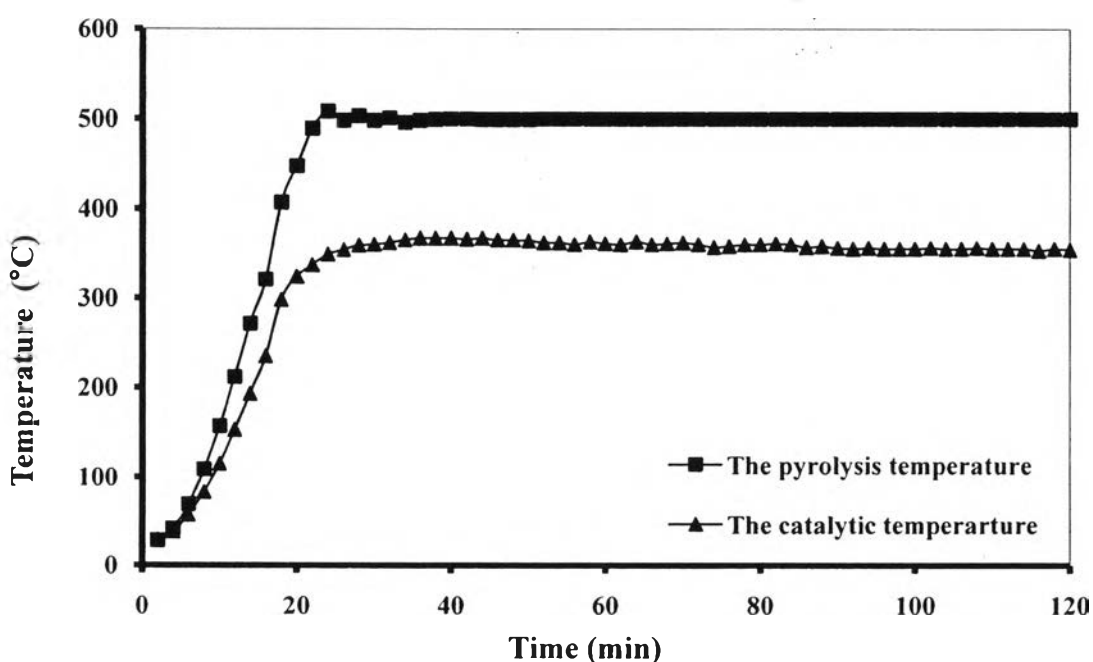
**Figure A11** Operating temperatures vs time on stream of Pd/Beta 250 on Bentonite (40% Active).

Table A12 Pyrolysis conditions: Pd/Beta 13.5 with Ball Clay (5% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.0	35.0	32	374.0	534.0	62	357.0	500.4	92	364.0	501.8
4	50.0	71.0	34	374.0	525.0	64	359.0	496.9	94	361.0	495.1
6	71.0	106.0	36	376.0	514.0	66	358.0	501.0	96	363.0	509.1
8	91.0	140.0	38	374.0	507.0	68	357.0	499.3	98	359.0	496.2
10	133.0	204.0	40	370.0	502.0	70	356.0	502.4	100	356.0	502.5
12	177.0	267.0	42	371.0	501.0	72	355.0	506.3	102	355.0	495.5
14	227.0	333.0	44	367.0	505.0	74	358.0	498.6	104	352.0	502.1
16	272.0	406.0	46	365.0	504.0	76	357.0	499.4	106	356.0	499.8
18	320.0	444.0	48	360.0	500.0	78	356.0	504.6	108	355.0	495.1
20	316.0	450.0	50	359.0	500.0	80	355.0	492.0	110	358.0	504.3
22	345.0	495.0	52	356.0	497.0	82	356.0	503.6	112	356.0	495.2
24	355.0	502.0	54	356.0	494.0	84	358.0	497.0	114	356.0	501.2
26	356.0	520.0	56	354.0	498.0	86	355.0	502.8	116	354.0	504.5
28	362.0	527.0	58	353.0	503.0	88	356.0	506.7	118	356.0	501.0
30	368.0	535.0	60	355.0	503.0	90	357.0	496.5	120	355.0	499.8

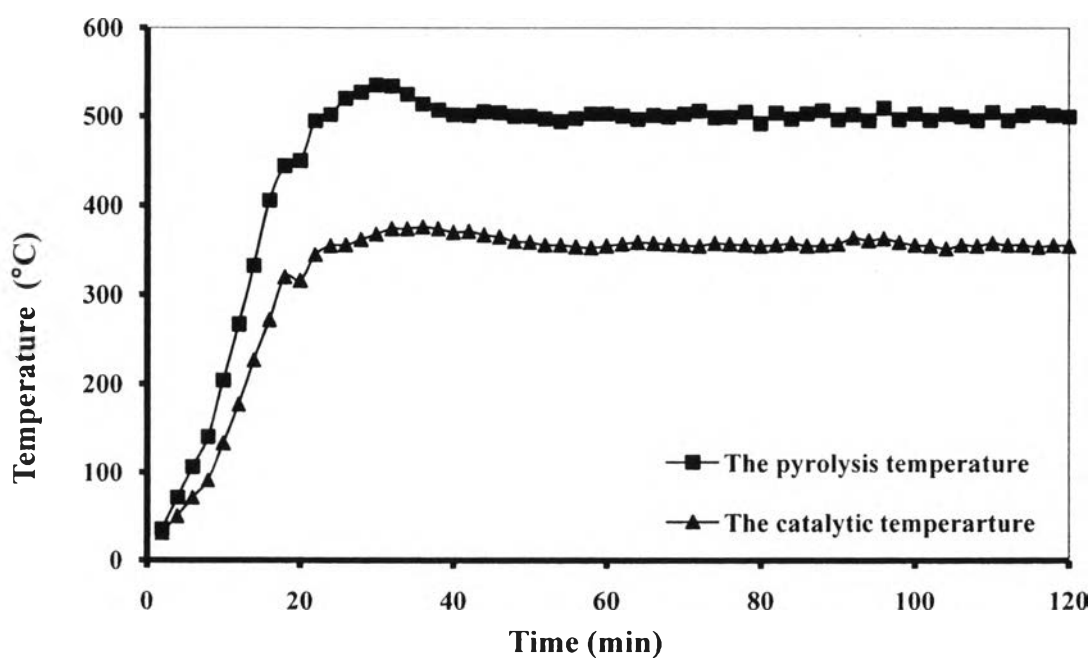
**Figure A12** Operating temperatures vs time on stream of Pd/Beta 13.5 on Ball Clay (5% Active).

Table A13 Pyrolysis conditions: Pd/Beta 13.5 with Ball Clay (20% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.0	42.0	32	363.0	525.0	62	351.0	500.0	92	356.0	500.0
4	43.0	67.0	34	361.0	515.0	64	352.0	500.0	94	355.0	500.0
6	63.0	91.0	36	360.0	503.0	66	354.0	500.0	96	354.0	500.0
8	103.0	140.0	38	359.0	490.0	68	353.0	500.0	98	349.0	500.0
10	141.0	194.0	40	356.0	500.0	70	347.0	500.0	100	355.0	500.0
12	182.0	241.0	42	352.0	500.0	72	351.0	500.0	102	357.0	500.0
14	223.0	306.0	44	349.0	502.0	74	352.0	500.0	104	354.0	500.0
16	269.0	366.0	46	355.0	500.0	76	350.0	500.0	106	352.0	500.0
18	307.0	426.0	48	355.0	502.0	78	353.0	500.0	108	351.0	500.0
20	316.0	469.0	50	353.0	501.0	80	350.0	500.0	110	356.0	500.0
22	325.0	470.0	52	354.0	500.0	82	351.0	500.0	112	354.0	500.0
24	350.0	440.0	54	351.0	500.0	84	352.0	500.0	114	354.0	500.0
26	352.0	500.0	56	352.0	500.0	86	354.0	500.0	116	353.0	500.0
28	362.0	520.0	58	353.0	500.0	88	355.0	500.0	118	354.0	500.0
30	363.0	536.0	60	351.0	500.0	90	358.0	500.0	120	355.0	500.0

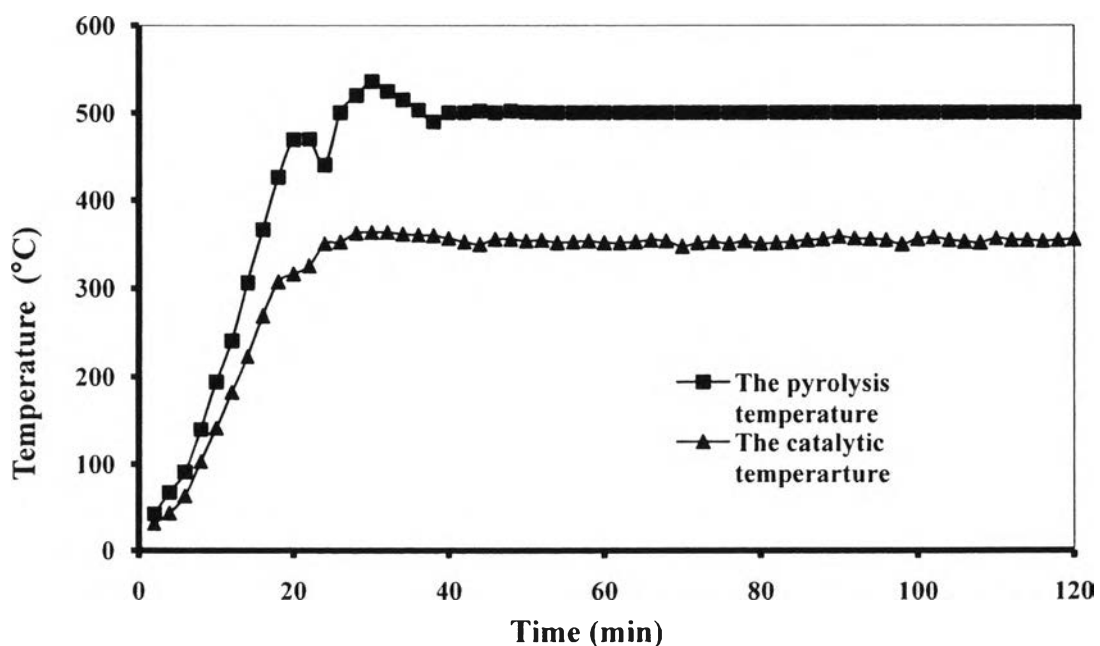
**Figure A13** Operating temperatures vs time on stream of Pd/Beta 13.5 on Ball Clay (20% Active).

Table A14 Pyrolysis conditions: Pd/Beta 13.5 with Ball Clay (40% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	33.0	35.0	32	357.0	505.0	62	353.0	500.0	92	358.0	500.0
4	48.0	50.0	34	357.0	500.0	64	354.0	500.0	94	357.0	500.0
6	70.0	77.0	36	358.0	503.0	66	351.0	500.0	96	354.0	500.0
8	105.0	121.0	38	357.0	494.0	68	350.0	500.0	98	355.0	500.0
10	147.0	173.0	40	356.0	498.0	70	348.0	500.0	100	354.0	500.0
12	182.0	216.0	42	354.0	499.0	72	355.0	500.0	102	356.0	500.0
14	252.0	302.0	44	353.0	501.0	74	356.0	500.0	104	354.0	500.0
16	298.0	353.0	46	355.0	499.0	76	353.0	500.0	106	352.0	500.0
18	320.0	420.0	48	354.0	500.0	78	353.0	500.0	108	350.0	500.0
20	317.0	473.0	50	356.0	500.0	80	352.0	500.0	110	350.0	500.0
22	316.0	500.0	52	358.0	500.0	82	350.0	500.0	112	348.0	500.0
24	338.0	497.0	54	355.0	500.0	84	348.0	500.0	114	351.0	500.0
26	344.0	504.0	56	356.0	500.0	86	350.0	500.0	116	354.0	500.0
28	349.0	488.0	58	355.0	500.0	88	354.0	500.0	118	356.0	500.0
30	355.0	481.0	60	352.0	500.0	90	357.0	500.0	120	355.0	500.0

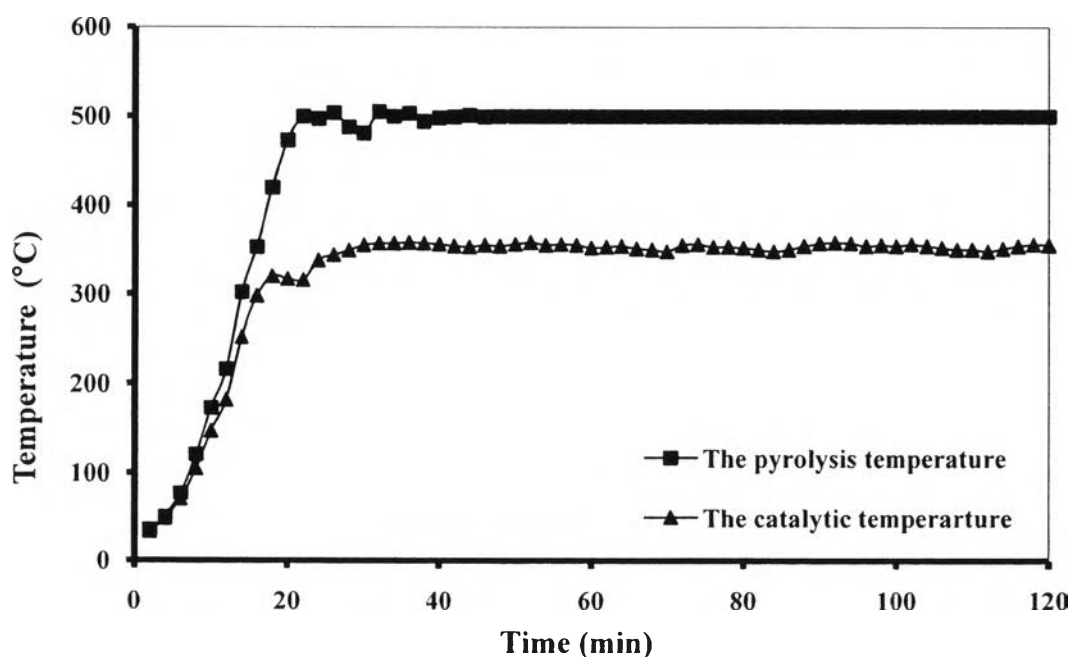
**Figure A14** Operating temperatures vs time on stream of Pd/Beta 13.5 on Ball Clay (40% Active)

Table A15 Pyrolysis conditions: Pd/Beta 250 with Ball Clay (5% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	29.0	31.0	32	377.0	497.0	62	361.0	501.0	92	354.0	505.9
4	43.0	47.0	34	376.0	499.0	64	359.0	500.0	94	353.0	499.2
6	65.0	74.0	36	375.0	500.0	66	357.0	501.0	96	354.0	503.9
8	95.0	111.0	38	372.0	501.0	68	352.0	500.0	98	354.0	499.4
10	133.0	157.0	40	370.0	499.0	70	362.0	500.0	100	354.0	506.3
12	176.0	210.0	42	367.0	500.0	72	360.0	500.0	102	354.0	498.2
14	225.0	267.0	44	365.0	500.0	74	359.0	500.0	104	353.0	505.5
16	277.0	327.0	46	362.0	500.0	76	357.0	500.0	106	354.0	498.5
18	327.0	397.0	48	360.0	500.0	78	354.0	500.0	108	354.0	507.3
20	323.0	446.0	50	360.0	500.0	80	352.0	500.0	110	354.0	507.1
22	332.0	496.0	52	358.0	500.0	82	351.0	500.0	112	354.0	505.3
24	350.0	506.0	54	356.0	500.0	84	352.0	500.0	114	355.0	498.7
26	356.0	506.0	56	353.0	500.0	86	353.0	500.0	116	355.0	505.9
28	368.0	501.0	58	362.0	500.0	88	353.0	500.0	118	355.0	497.4
30	375.0	498.0	60	363.0	500.0	90	354.0	500.0	120	354.0	504.3

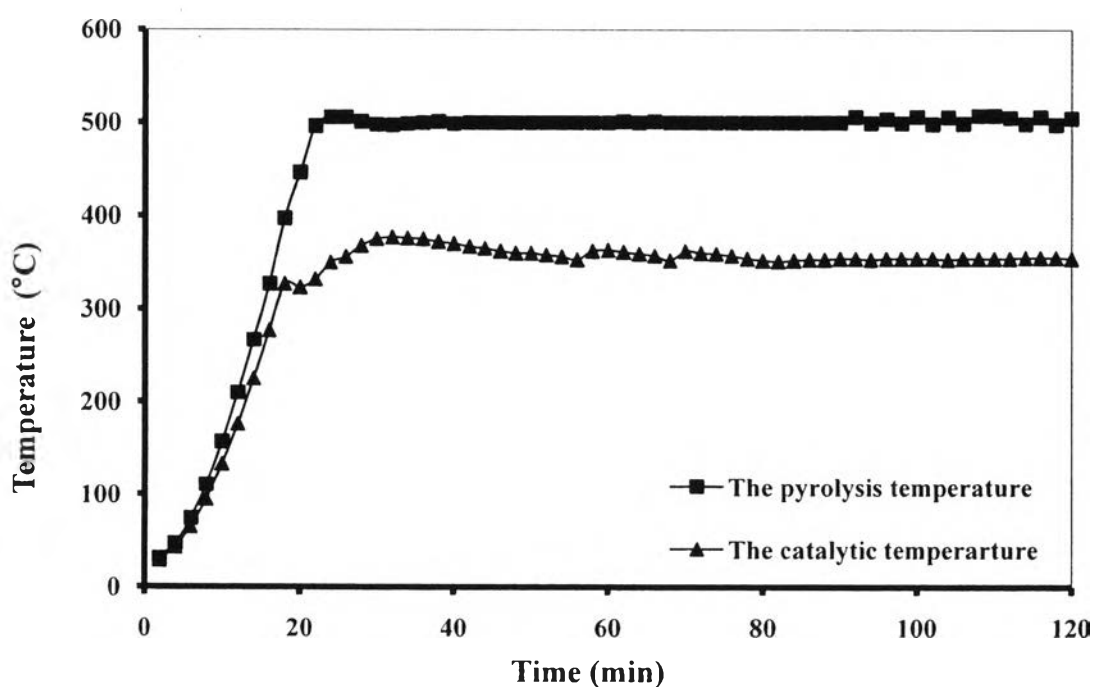
**Figure A15** Operating temperatures vs time on stream of Pd/Beta 250 on Ball Clay (5% Active).

Table A16 Pyrolysis conditions: Pd/Beta 250 with Ball Clay (20% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	33.0	35.0	32	373.0	500.0	62	353.0	500.0	92	350.0	500.0
4	45.0	50.0	34	375.0	495.0	64	351.0	500.0	94	352.0	500.0
6	66.0	76.0	36	375.0	498.0	66	349.0	500.0	96	354.0	500.0
8	95.0	112.0	38	373.0	501.0	68	354.0	500.0	98	355.0	500.0
10	130.0	158.0	40	372.0	497.0	70	352.0	500.0	100	358.0	500.0
12	172.0	209.0	42	370.0	501.0	72	351.0	500.0	102	356.0	500.0
14	213.0	261.0	44	369.0	497.0	74	348.0	500.0	104	355.0	500.0
16	265.0	325.0	46	368.0	500.0	76	351.0	500.0	106	352.0	500.0
18	320.0	405.0	48	367.0	500.0	78	353.0	500.0	108	350.0	500.0
20	332.0	463.0	50	365.0	500.0	80	355.0	500.0	110	348.0	500.0
22	356.0	506.0	52	363.0	500.0	82	352.0	500.0	112	352.0	500.0
24	355.0	504.0	54	361.0	500.0	84	350.0	500.0	114	353.0	500.0
26	357.0	498.0	56	359.0	500.0	86	350.0	500.0	116	354.0	500.0
28	360.0	503.0	58	357.0	500.0	88	348.0	500.0	118	355.0	500.0
30	369.0	502.0	60	355.0	500.0	90	349.0	500.0	120	353.0	500.0

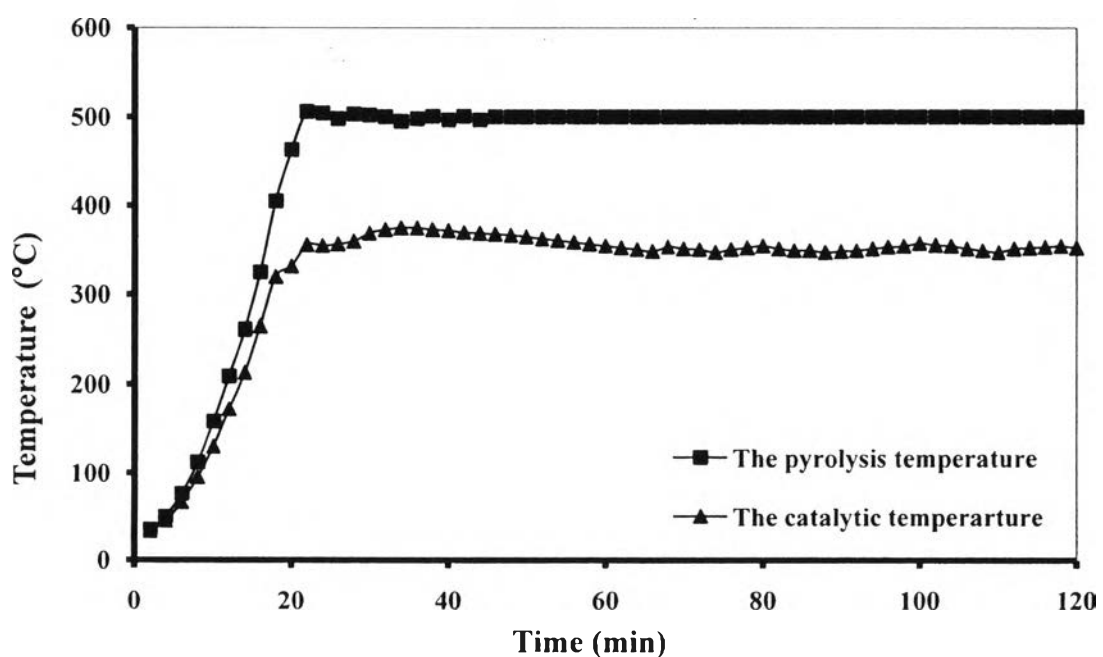
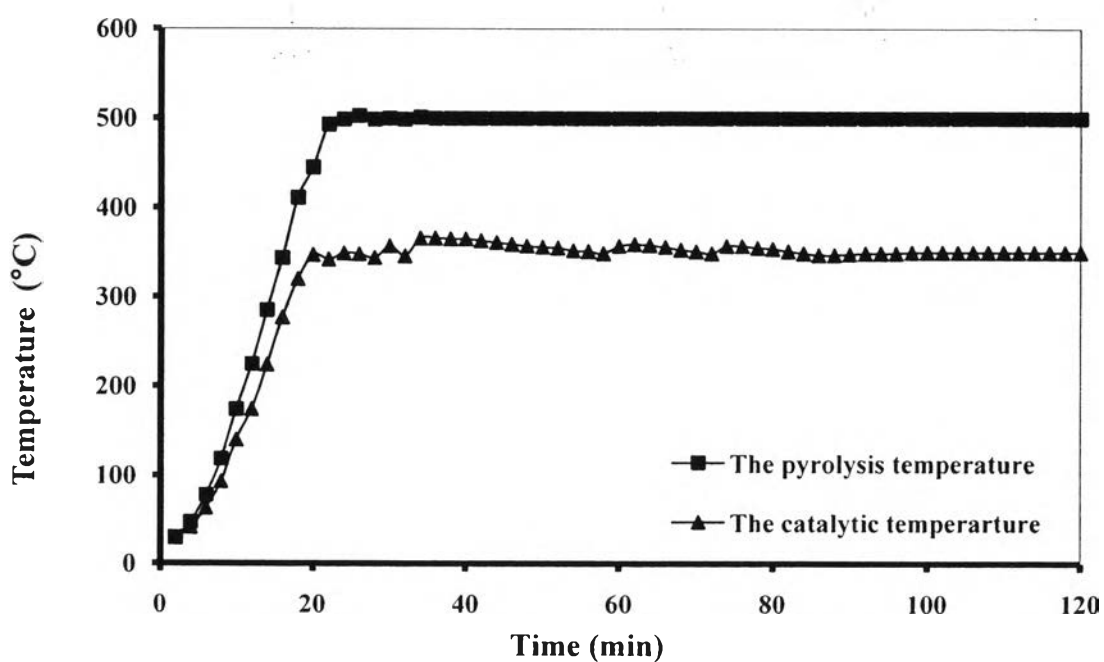
**Figure A16** Operating temperatures vs time on stream of Pd/Beta 250 on Ball Clay (20% Active).

Table A17 Pyrolysis conditions: Pd/Beta 250 with Ball Clay (40% Active)Tire = 30 g, N₂ flow = 50 ml/min

Pyrolysis Zone Temperature: = 500 °C

Catalyst Zone Temperature: = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	29.0	30.0	32	346.0	499.0	62	359.0	500.0	92	349.0	500.0
4	41.0	47.0	34	366.0	501.0	64	358.0	500.0	94	349.0	500.0
6	63.0	78.0	36	366.0	500.0	66	356.0	500.0	96	349.0	500.0
8	93.0	119.0	38	365.0	500.0	68	353.0	500.0	98	350.0	500.0
10	140.0	174.0	40	365.0	500.0	70	351.0	500.0	100	350.0	500.0
12	174.0	225.0	42	363.0	500.0	72	349.0	500.0	102	350.0	500.0
14	224.0	285.0	44	361.0	500.0	74	357.0	500.0	104	350.0	500.0
16	277.0	344.0	46	359.0	500.0	76	357.0	500.0	106	350.0	500.0
18	320.0	411.0	48	357.0	500.0	78	355.0	500.0	108	350.0	500.0
20	347.0	445.0	50	356.0	500.0	80	354.0	500.0	110	350.0	500.0
22	342.0	493.0	52	355.0	500.0	82	351.0	500.0	112	350.0	500.0
24	349.0	499.0	54	352.0	500.0	84	349.0	500.0	114	350.0	500.0
26	348.0	503.0	56	351.0	500.0	86	347.0	500.0	116	350.0	500.0
28	344.0	499.0	58	349.0	500.0	88	347.0	500.0	118	350.0	500.0
30	357.0	500.0	60	357.0	500.0	90	348.0	500.0	120	350.0	500.0

**Figure A17** Operating temperatures vs time on stream of Pd/Beta 250 on Ball Clay (40% Active).

Appendix B Yields of Pyrolysis Products

Table B1 Weight percentage of pyrolysis products obtained from each pure component

Catalyst Products	Non Cat.	Pd/Beta (Si/Al = 13.5)	Pd/Beta (Si/Al = 250)	Bentonite	Ball clay
Gas	15.67	21.10	21.13	18.77	18.00
Liquid	42.10	36.30	35.00	38.57	38.54
Solid	42.23	42.60	43.87	42.67	43.47

Table B2 Weight percentage of pyrolysis products obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of bentonite clay

Catalyst Products	5% active	20%active	40%active	Pd/Beta (Si/Al = 13.5)
Gas	22.33	24.93	22.73	21.10
Liquid	33.80	31.17	34.03	36.30
Solid	43.87	43.90	43.23	42.60

Table B3 Weight percentage of pyrolysis products obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of ball clay

Catalyst Products	5% active	20%active	40%active	Pd/Beta (Si/Al = 13.5)
Gas	20.53	23.53	24.90	21.10
Liquid	35.90	33.27	31.13	36.30
Solid	43.57	43.20	43.97	42.60

Table B4 Weight percentage of pyrolysis products obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of bentonite clay

Catalyst Products	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Gas	21.77	24.60	24.63	21.13
Liquid	34.3	31.44	32.2	35.00
Solid	43.93	44.06	43.16	43.87

Table B5 Weight percentage of pyrolysis products obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of ball clay

Catalyst Products	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Gas	22.80	21.64	20.80	21.13
Liquid	33.83	34.76	36.46	35.00
Solid	43.37	43.60	42.74	43.87

Appendix C The Pyrolysis Gas Compositions

Table C1 Weight percentage of gas product obtained from each from each pure component

gas composition	Catalysts				
	Non Cat.	Pd/Beta (Si/Al = 13.5)	Pd/Beta (Si/Al = 250)	Bentonite	Ball clay
Methane	22.01	15.88	22.20	21.36	22.59
Ethylene	9.26	6.19	8.24	8.51	8.88
Ethane	18.26	14.35	18.98	18.90	19.00
Propylene	10.88	9.85	10.64	10.41	10.65
Propane	8.96	10.28	9.98	10.04	9.63
Mixed C4	20.36	29.30	20.23	20.27	19.15
Mixed C5	8.22	11.18	7.47	8.18	7.87
Mixed C6+	2.04	2.98	2.26	2.32	2.22

Table C2 Weight percentage of gas product obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of bentonite clay

gas composition	Catalysts			
	5% active	20% active	40% active	Pd/Beta (Si/Al = 13.5)
Methane	22.54	22.24	22.31	15.88
Ethylene	8.77	8.34	8.55	6.19
Ethane	18.78	18.18	18.07	14.35
Propylene	10.52	10.25	10.45	9.85
Propane	9.55	9.29	9.07	10.28
Mixed C4	18.80	19.64	19.63	29.30
Mixed C5	8.47	8.97	9.18	11.18
Mixed C6+	2.57	3.09	2.75	2.98

Table C3 Weight percentage of gas product obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of ball clay

gas composition	Catalysts			
	5% active	20%active	40%active	Pd/Beta (Si/Al = 13.5)
Methane	21.73	20.97	22.68	15.88
Ethylene	10.36	9.84	7.88	6.19
Ethane	17.74	17.66	18.40	14.35
Propylene	11.59	11.39	10.19	9.85
Propane	8.40	8.67	9.57	10.28
Mixed C4	18.88	19.46	19.93	29.30
Mixed C5	8.35	9.11	8.70	11.18
Mixed C6+	2.95	2.90	2.64	2.98

Table C4 Weight percentage of gas product obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of bentonite clay

gas composition	Catalysts			
	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Methane	23.14	23.28	21.79	22.20
Ethylene	8.99	8.42	8.52	8.24
Ethane	18.62	19.00	18.91	18.98
Propylene	10.65	10.28	10.33	10.64
Propane	9.06	9.51	9.79	9.98
Mixed C4	18.74	19.07	19.93	20.23
Mixed C5	8.38	7.99	8.26	7.47
Mixed C6+	2.42	2.45	2.46	2.26

Table C5 Weight percentage of gas product obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of ball clay

gas composition	Catalysts			
	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Methane	22.47	21.95	21.78	22.20
Ethylene	8.66	8.35	8.92	8.24
Ethane	18.92	18.69	19.37	18.98
Propylene	10.35	10.15	10.77	10.64
Propane	9.67	9.72	10.38	9.98
Mixed C4	20.13	19.46	19.89	20.23
Mixed C5	7.70	9.29	7.28	7.47
Mixed C6+	2.10	2.38	1.61	2.26

Appendix D Amount of Asphaltene in Pyrolysis Oil

Table D1 Amount of asphaltene in pyrolysis oil

No.	Parameter studied	detail	Asphaltene in oil (wt %)
1	Pure component	Non cat	0.280
2		Bentonite clay	0.110
3		Ball clay	0.126
4		Pd/Beta (Si/Al = 13.5)	0.062
5		Pd/Beta (Si/Al = 250)	0.030
6	Agglomerated Pd/Beta (Si/Al = 13.5)	5%active Ben	0.016
7		20%active Ben	0.060
8		40%active Ben	0.018
9		5%active Ball	0.076
10		20%active Ball	0.046
11		40%active Ball	0.026
12	Agglomerated Pd/Beta (Si/Al = 250)	5%active Ben	0.046
13		20%active Ben	0.042
14		40%active Ben	0.050
15		5%active Ball	0.052
16		20%active Ball	0.062
17		40%active Ball	0.036

Appendix E Chemical Compositions of Maltenes

Table E1 Chemical compositions of maltenes obtained from each from each pure component

Catalyst component Chemical composition	Non Cat.	Pd/Beta (Si/Al = 13.5)	Pd/Beta (Si/Al = 250)	Bentonite	Ball clay
Saturated HC.	50.65	78.27	68.90	65.83	63.24
Mono-aromatic	19.84	7.71	13.39	13.07	14.62
Di-aromatic	10.97	4.67	3.54	10.09	7.51
Poly-aromatic	12.53	5.61	9.84	7.57	9.49
Polar-aromatic	6.01	3.74	4.33	3.44	5.14

Table E2 Chemical compositions of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of bentonite clay

Catalyst Chemical composition	5% active	20%active	40%active	Pd/Beta (Si/Al = 13.5)
Saturated HC.	71.87	78.44	81.05	78.27
Mono-aromatic	13.76	10.78	6.98	7.71
Di-aromatic	5.50	5.58	7.98	4.67
Poly-aromatic	6.12	2.97	2.00	5.61
Polar-aromatic	2.75	2.23	2.00	3.74

Table E3 Chemical compositions of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of ball clay

Catalyst Chemical composition	5% active	20%active	40%active	Pd/Beta (Si/Al = 13.5)
Saturated HC.	76.43	80.14	82.59	78.27
Mono-aromatic	9.52	7.16	5.47	7.71
Di-aromatic	6.67	6.00	4.48	4.67
Poly-aromatic	4.76	3.46	3.98	5.61
Polar-aromatic	2.62	3.23	3.48	3.74

Table E4 Chemical compositions of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of bentonite clay

Catalyst \ Chemical composition	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Saturated HC.	69.82	75.33	77.51	68.90
Mono-aromatic	12.53	9.28	9.12	13.39
Di-aromatic	5.88	4.51	3.95	3.54
Poly-aromatic	5.88	8.49	6.38	9.84
Polar-aromatic	5.88	2.39	3.04	4.33

Table E5 Chemical compositions of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of ball clay

Catalyst \ Chemical composition	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Saturated HC.	74.58	76.40	73.30	68.90
Mono-aromatic	9.20	8.55	9.13	13.39
Di-aromatic	4.12	3.24	3.75	3.54
Poly-aromatic	6.78	6.19	6.79	9.84
Polar-aromatic	5.33	5.60	7.03	4.33

Appendix F True Boiling Point of Maltenes

Table F1 True boiling point of maltenes obtained from each pure component

% Off	Boiling point (°C)				
	Non Cat.	Pd/Beta (Si/Al = 13.5)	Pd/Beta (Si/Al = 250)	Bentonite	Ball clay
0	42.2	40.4	73.0	23.3	78.9
5	154.9	101.2	111.7	112.1	146.7
10	158.4	113.8	121.5	147.0	148.1
15	170.3	147.1	147.3	148.3	150.6
20	180.6	148.7	149.1	151.2	167.5
25	191.7	151.9	163.7	167.8	172.2
30	203.5	168.8	169.3	176.5	186.3
35	212.7	181.3	183.7	189.7	195.3
40	221.4	193.2	193.1	201.7	204.7
45	229.8	205.8	204.7	210.5	213.4
50	239.8	215.8	214.0	219.4	221.2
55	251.6	226.3	222.8	227.3	228.6
60	264.1	236.7	232.3	236.8	237.6
65	275.6	249.2	242.8	247.5	248.0
70	288.9	260.8	253.9	259.0	259.3
75	303.7	272.9	265.0	270.7	271.4
80	322.6	284.3	276.0	281.5	282.6
85	345.1	298	289.8	295.5	296.6
90	374.3	318.1	310.0	316.1	316.0
95	410.6	361.4	351.9	353.5	350.0
100	531.3	454.9	453.4	438.6	440.0

Table F2 True boiling point of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of bentonite clay

% Off	Boiling point (°C)		
	5% active	20% active	40% active
0	71.9	72.9	44.3
5	112.2	112.4	110.0
10	116.1	118.8	113.3
15	148.0	148.0	144.9
20	148.8	149.0	148.3
25	151.0	151.7	150.1
30	165.9	166.7	164.4
35	172.0	172.6	170.2
40	186.2	186.9	184.6
45	196.6	197.9	194.4
50	207.5	208.1	206.9
55	216.2	216.8	216.0
60	224.8	225.1	225.5
65	234.6	234.6	235.4
70	245.8	245.6	247.0
75	258.5	257.8	258.7
80	273.0	271.9	271.7
85	288.2	286.6	284.6
90	310.0	309.3	303.2
95	344.9	351.3	342.2
100	428.1	443.2	436.1

Table F3 True boiling point of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of ball clay

% Off	Boiling point (°C)		
	5% active	20% active	40% active
0	46.4	46.8	38.5
5	111.8	111.8	104.4
10	113.8	113.6	113.1
15	147.5	145.2	121.0
20	148.6	148.4	148.2
25	150.5	149.9	149.1
30	165.1	156.4	152.5
35	171.8	168.9	167.4
40	187.2	178.6	173.6
45	200.2	190.9	187.8
50	211.7	203.1	199.4
55	221.9	212.7	209.6
60	232.0	221.9	219.4
65	243.0	231.3	227.8
70	257.1	241.4	237.5
75	272.0	254.4	249.1
80	285.9	268.3	261.2
85	304.9	282.7	275.2
90	334.8	302.8	293.3
95	381.0	342.8	328.4
100	459.9	433.3	415.6

Table F4 True boiling point of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of bentonite clay

% Off	Boiling point (°C)		
	5% active	20% active	40% active
0	48.5	41.7	47.2
5	111.7	109.7	110.8
10	113.6	112.9	112.6
15	146.8	121.4	129.4
20	148.4	148.0	147.5
25	150.1	148.8	148.9
30	162.4	150.8	151.0
35	169.6	165.1	166.6
40	182.2	170.5	172.0
45	193.0	184.2	186.5
50	205.1	193.9	197.9
55	214.8	205.6	207.9
60	223.6	215.2	217.2
65	233.1	223.9	225.5
70	243.9	233.7	235.8
75	256.1	245.2	247.6
80	269.5	259.3	261.1
85	282.9	276.0	276.0
90	302.2	297.1	296.4
95	341.1	336.1	336.8
100	435.5	431.6	442.5

Table F5 True boiling point of maltenes obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of ball clay

% Off	Boiling point (°C)		
	5% active	20% active	40% active
0	39.8	41.7	71.4
5	112.1	112.7	109.1
10	114.1	115.0	114.2
15	147.2	148.0	145.4
20	148.7	148.9	147.7
25	150.5	151.0	159.1
30	164.8	165.7	168.3
35	170.7	172.3	183.6
40	185.4	187.1	194.3
45	196.6	198.7	206.8
50	208.5	209.1	217.3
55	218.7	218.8	226.8
60	227.7	227.1	237.9
65	238.4	236.7	250.5
70	251.0	247.6	262.6
75	263.8	258.5	273.0
80	276.7	271.0	284.6
85	291.9	283.5	297.4
90	315.2	301.5	315.7
95	356.7	337.8	351.1
100	438.1	424.5	439.7

Appendix G True Boiling Point of Maltenes, Saturated Hydrocarbons, Mono-, Di-, Poly-, and Polar-aromatics in Maltenes

Table G1 Batch 1 Non Cat

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	42.2	37.1	45.2	38.4	43.5	40.7
5	154.9	191.1	270.8	75.5	72.6	69.0
10	158.4	204.7	280.9	246.1	73.0	201.9
15	170.3	212.8	289.4	306.2	73.4	208.7
20	180.6	219.6	293.8	321.6	73.8	216.9
25	191.7	225.9	300.3	327.9	74.2	227.0
30	203.5	231.6	303.2	337.5	74.8	238.6
35	212.7	238.4	307.5	342.7	76.5	247.2
40	221.4	245.6	312.6	347.5	219.8	257.8
45	229.8	253.4	316.6	351.3	262.6	269.6
50	239.8	260.6	321.4	356.7	293.5	283.1
55	251.6	269.0	326.4	361.7	318.4	296.0
60	264.1	275.5	330.7	365.4	340.1	309.8
65	275.6	284.0	336.4	370.4	356.6	324.7
70	288.9	293.6	344.1	375.9	373.1	342.4
75	303.7	306.1	353.0	382.4	385.3	362.2
80	322.6	323.0	363.0	389.8	395.1	386.1
85	345.1	345.4	373.9	399.2	413.3	416.9
90	374.3	375.3	388.1	410.2	439.1	461.8
95	410.6	410.1	408.4	432.6	486.3	524.8
100	531.3	476.9	450.3	543.9	568.3	575.3

Table G2 Batch 2 0.25 wt. % Pd/Beta Si/Al = 13.5 Pure active

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	40.4	36.4	26.7	28.8	22.7	22.5
5	101.2	129.3	198.5	183.6	28.6	25.2
10	113.8	149.7	252.0	264.1	39.6	29.4
15	147.1	167.7	261.4	284.8	75.9	34.5
20	148.7	179.7	269.8	288.5	247.0	40.4
25	151.9	190.4	274.4	292.0	280.2	73.5
30	168.8	201.1	276.4	294.0	305.6	201.5
35	181.3	209.5	282.9	301.0	322.4	234.6
40	193.2	215.9	287.6	306.3	338.4	252.2
45	205.8	224.0	291.1	309.0	351.1	270.3
50	215.8	231.8	295.3	315.0	362.7	290.3
55	226.3	240.2	301.0	320.1	372.8	311.4
60	236.7	249.5	304.8	327.7	382.0	334.1
65	249.2	258.6	313.5	335.6	391.2	359.8
70	260.8	268.0	322.7	347.3	401.1	381.4
75	272.9	276.0	332.7	358.5	411.2	401.3
80	284.3	285.7	348.6	372.5	422.7	417.9
85	298.0	297.7	371.2	387.6	437.8	438.4
90	318.1	315.7	397.3	405.8	459.1	468.4
95	361.4	360.5	428.7	430.1	497.2	517.2
100	454.9	469.7	521.6	517.6	569.5	574.8

Table G3 Batch 3 0.25 wt. % Pd/Beta Si/Al = 250 Pure active

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	73.0	75.9	54.2	51.0	73.8	167.3
5	111.7	147.1	79.0	74.6	221.8	201.3
10	121.5	160.9	180.3	77.3	244.1	205.2
15	147.3	169.1	254.1	82.1	257.7	209.5
20	149.1	183.2	271.8	148.8	271.5	215.1
25	163.7	191.2	282.7	165.2	283.1	221.6
30	169.3	202.0	288.9	174.2	294.0	228.8
35	183.7	209.4	293.0	191.7	306.4	237.4
40	193.1	215.7	298.5	205.4	316.9	245.7
45	204.7	222.6	302.0	221.9	325.4	253.3
50	214.0	229.8	306.9	252.7	338.7	262.0
55	222.8	237.2	313.0	301.7	349.3	271.5
60	232.3	245.6	317.8	314.6	362.5	283.5
65	242.8	254.1	324.5	328.7	375.3	296.6
70	253.9	262.8	332.0	343.8	386.8	311.6
75	265.0	271.2	342.5	355.1	397.4	329.5
80	276.0	280.2	355.9	367.3	408.8	350.0
85	289.8	291.6	371.4	380.3	422.0	373.1
90	310.0	308.7	389.7	396.4	438.4	398.6
95	351.9	345.5	414.4	416.9	461.9	432.4
100	453.4	441.4	474.1	483.7	507.5	496.6

Table G4 Batch 4 Bentonite clay

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	23.3	146.8	147.1	113.3	113.5	153.7
5	112.1	152.7	156.9	187.1	189.0	196.3
10	147.0	169.9	170.9	232.2	225.0	202.6
15	148.3	184.8	185.9	266.6	250.6	207.4
20	151.2	192.9	194.2	296.5	274.2	214.8
25	167.8	203.6	204.7	319.0	295.6	222.4
30	176.5	211.2	212.6	338.9	313.0	232.2
35	189.7	218.0	219.4	361.0	328.7	241.3
40	201.7	223.8	224.9	381.4	343.4	248.2
45	210.5	230.9	232.1	399.3	358.3	257.6
50	219.4	238.1	239.3	412.4	374.1	268.3
55	227.3	246.0	247.3	422.1	390.7	280.5
60	236.8	254.5	255.5	435.0	408.9	292.4
65	247.5	262.8	264.2	452.3	420.8	306.1
70	259.0	271.2	272.1	472.7	437.5	322.0
75	270.7	278.5	280.1	495.6	460.4	341.0
80	281.5	287.9	289.7	515.2	487.5	364.0
85	295.5	299.3	301.8	532.7	512.7	391.9
90	316.1	318.8	322.4	548.6	536.9	425.6
95	353.5	353.7	361.3	565.3	559.4	486.5
100	438.6	450.3	485.7	580.6	580.1	570.5

Table G5 Batch 5 Ball clay

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	78.9	37.9	200.7	24.4	112.0	153.3
5	146.7	150.2	232.9	77.7	176.2	189.3
10	148.1	170.7	245.8	254.8	269.6	197.5
15	150.6	185.9	253.7	270.1	287.0	200.3
20	167.5	194.2	260.3	275.5	292.4	205.9
25	172.2	203.9	265.0	279.2	299.1	213.4
30	186.3	211.5	271.4	287.5	304.0	221.7
35	195.3	217.7	272.7	292.3	307.7	232.0
40	204.7	222.7	277.0	297.3	312.0	240.8
45	213.4	229.0	282.4	301.4	315.9	249.1
50	221.2	235.4	286.3	303.5	320.6	261.4
55	228.6	243.0	290.4	309.0	327.0	273.2
60	237.6	251.0	294.5	315.3	333.6	285.9
65	248.0	258.7	300.9	320.2	340.1	299.1
70	259.3	267.6	306.9	325.9	348.5	314.2
75	271.4	275.2	315.6	331.5	356.5	329.9
80	282.6	284.9	325.7	340.5	366.2	349.3
85	296.6	297.6	337.1	354.4	377.2	374.6
90	316.0	316.7	357.5	373.4	391.0	407.5
95	350.0	353.6	385.5	403.0	422.3	457.6
100	440.0	447.9	505.0	524.1	471.4	562.7

Table G6 Batch 6 0.25Pd/Beta 13.5 with Bentonite clay (5% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	71.9	34.7	35.6	24.8	23.3	22.5
5	112.2	119.3	148.8	170.2	74.1	28.8
10	116.1	151.6	169.7	192.0	199.3	40.7
15	148.0	168.7	187.1	207.3	222.9	193.4
20	148.8	179.2	198.0	221.7	246.4	201.7
25	151.0	186.9	208.4	238.7	275.4	206.5
30	165.9	193.7	214.4	256.4	290.1	213.4
35	172.0	203.2	222.6	270.3	298.2	221.3
40	186.2	207.9	228.3	276.1	305.6	231.0
45	196.6	214.5	234.6	283.7	310.4	241.3
50	207.5	220.6	243.7	290.7	315.8	250.6
55	216.2	225.0	249.2	295.8	322.2	262.0
60	224.8	232.9	257.1	302.0	329.1	275.1
65	234.6	240.2	265.1	306.4	337.0	289.7
70	245.8	250.2	273.0	315.0	344.0	305.1
75	258.5	259.9	281.1	321.1	352.5	323.1
80	273.0	272.0	290.7	329.4	362.8	344.0
85	288.2	284.6	303.5	338.4	375.5	368.5
90	310.0	301.7	322.7	355.7	393.5	397.6
95	344.9	337.3	353.0	385.4	425.4	441.3
100	428.1	442.4	455.8	499.3	525.3	547.7

Table G7 Batch7 0.25Pd/Beta 13.5 with Bentonite clay (20% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	72.9	72.5	23.9	23.7	28.4	32.8
5	112.4	147.1	212.5	225.6	258.6	178.9
10	118.8	165.5	229.9	252.9	282.7	197.2
15	148.0	173.8	236.1	260.6	293.3	200.1
20	149.0	186.4	245.8	270.4	300.6	205.9
25	151.7	194.6	249.7	275.3	308.1	214.9
30	166.7	202.9	255.3	278.0	313.9	226.4
35	172.6	209.8	262.0	285.4	320.2	239.3
40	186.9	214.8	265.8	292.0	326.7	250.2
45	197.9	220.4	272.5	299.0	333.9	265.0
50	208.1	226.4	275.2	303.5	341.9	280.1
55	216.8	232.9	280.7	310.9	349.9	295.6
60	225.1	240.0	286.7	318.5	358.0	312.3
65	234.6	248.7	292.6	326.5	367.3	329.1
70	245.6	257.5	301.2	334.5	376.7	347.9
75	257.8	267.8	311.5	346.4	387.0	368.0
80	271.9	277.5	325.3	362.5	398.9	386.4
85	286.6	290.6	342.3	380.5	413.1	404.2
90	309.3	311.4	368.9	402.5	431.9	425.1
95	351.3	354.3	404.8	433.6	462.7	455.4
100	443.2	451.9	509.2	521.6	541.3	531.6

Table G8 Batch8 0.25Pd/Beta 13.5 with Bentonite clay (40% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	44.3	29.4	23.9	22.9	74.5	44.5
5	110.0	147.8	193.4	36.8	249.1	196.3
10	113.3	150.7	230.7	258.5	276.4	210.8
15	144.9	168.3	245.1	271.3	290.3	219.5
20	148.3	174.7	250.9	275.8	297.9	228.3
25	150.1	186.8	255.6	278.6	306.5	237.6
30	164.4	193.6	262.4	285.7	312.8	247.1
35	170.2	203.9	266.6	291.0	319.0	256.6
40	184.6	210.4	272.4	295.0	326.4	266.4
45	194.4	215.9	274.6	300.8	334.5	276.6
50	206.9	223.0	278.7	305.8	343.2	287.5
55	216.0	229.8	284.4	313.2	351.7	298.3
60	225.5	236.4	289.3	320.9	360.0	310.4
65	235.4	245.2	293.7	330.1	369.4	324.5
70	247.0	254.0	302.1	339.4	378.7	340.9
75	258.7	263.4	311.3	352.9	388.9	359.1
80	271.7	273.5	324.4	369.3	400.7	379.8
85	284.6	285.0	340.7	387.4	414.4	402.4
90	303.2	301.2	366.8	409.3	432.4	429.4
95	342.2	338.9	402.3	441.2	461.6	468.0
100	436.1	451.7	505.6	533.1	539.2	549.5

Table G9 Batch9 0.25Pd/Beta 13.5 with Ball clay (5% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	46.4	50.4	53.8	38.3	26.7	23.5
5	111.8	75.3	211.0	84.9	74.7	37.9
10	113.8	78.6	237.3	185.4	183.7	217.5
15	147.5	83.9	252.3	206.3	223.4	229.0
20	148.6	148.2	260.0	227.7	253.8	237.3
25	150.5	163.9	269.2	270.0	281.5	244.9
30	165.1	170.4	273.8	282.8	306.8	252.6
35	171.8	185.8	278.4	291.8	321.0	260.8
40	187.2	194.4	285.4	298.8	333.1	268.7
45	200.2	206.3	291.1	306.1	343.8	276.1
50	211.7	214.4	298.1	312.9	353.0	285.0
55	221.9	222.5	304.6	319.2	361.6	295.4
60	232.0	230.9	313.2	327.9	370.0	306.7
65	243.0	240.2	322.5	337.0	378.0	319.2
70	257.1	251.8	331.8	349.2	385.9	334.1
75	272.0	263.7	343.3	361.6	394.4	350.3
80	285.9	275.6	359.4	375.7	403.8	367.8
85	304.9	290.5	376.1	390.7	414.3	385.8
90	334.8	314.3	396.6	407.3	428.7	406.4
95	381.0	363.4	422.7	429.7	451.5	433.4
100	459.9	449.1	478.0	484.2	504.9	475.0

Table G10 Batch 10 0.25Pd/Beta 13.5 with Ball clay (20% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	46.8	55.9	77.8	57.8	37.1	31.3
5	111.8	75.4	173.8	81.5	74.4	185.9
10	113.6	80.0	200.1	164.6	75.9	202.5
15	145.2	146.4	221.2	173.4	211.1	206.6
20	148.4	149.7	235.3	189.8	243.8	211.3
25	149.9	167.5	249.7	203.4	270.8	217.7
30	156.4	175.8	255.2	218.0	298.1	225.1
35	168.9	188.2	264.4	241.0	316.9	233.4
40	178.6	198.1	270.3	270.2	329.2	242.9
45	190.9	206.8	274.5	276.8	341.5	252.2
50	203.1	213.6	280.0	286.9	350.9	262.0
55	212.7	221.2	286.7	293.9	359.9	272.5
60	221.9	228.0	291.8	301.8	368.9	285.7
65	231.3	235.9	299.9	309.7	377.0	299.9
70	241.4	245.4	307.5	318.5	385.3	316.0
75	254.4	256.0	318.8	330.0	393.8	334.9
80	268.3	268.3	331.3	343.4	403.3	356.2
85	282.7	279.9	347.0	362.3	413.8	378.8
90	302.8	297.3	370.3	385.0	428.1	403.2
95	342.8	332.4	400.0	413.3	450.2	433.5
100	433.3	431.6	465.2	477.4	501.6	493.4

Table G11 Batch 11 0.25Pd/Beta 13.5 with Ball clay (40% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	38.5	70.4	75.3	70.7	35.8	21.0
5	104.4	82.0	229.8	189.4	190.3	48.5
10	113.1	146.7	245.3	213.8	216.0	184.1
15	121	149.8	251.9	240.2	231.6	199.4
20	148.2	166.8	255.5	270.6	241.4	202.3
25	149.1	171.9	264.1	277.2	250.0	205.8
30	152.5	184.9	269.0	286.6	261.9	210.7
35	167.4	192.3	272.9	292.0	273.7	217.7
40	173.6	202.5	276.3	296.1	287.4	225.7
45	187.8	209.8	282.1	302.6	302.8	235.5
50	199.4	215.8	287.2	307.9	314.8	247.1
55	209.6	222.2	291.6	313.4	324.6	259.1
60	219.4	229.3	299.0	318.7	336.7	272.2
65	227.8	236.4	305.0	325.8	345.5	288.0
70	237.5	245.1	314.1	333.2	356.0	304.7
75	249.1	254.4	323.9	343.0	367.1	324.1
80	261.2	264.6	333.3	353.9	378.5	348.4
85	275.2	275.0	346.3	367.6	390.7	373.8
90	293.3	290.0	365.2	385.3	407.6	399.7
95	328.4	320.2	390.2	412.3	432.8	432.3
100	415.6	413.8	463.7	483.1	498.0	494.6

Table G12 Batch 12 0.25Pd/Beta 250 with Bentonite clay (5% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	48.5	24.4	25.6	22.7	59.9	23.3
5	111.7	174.9	213.9	37.1	277.6	42.1
10	113.6	192.1	227.9	210.1	289.9	138.7
15	146.8	201.4	231.2	259.0	297.8	251.8
20	148.4	207.3	236.7	267.5	304.6	269.9
25	150.1	213.3	245.2	274.6	311.4	282.3
30	162.4	218.7	247.2	280.7	318.2	291.5
35	169.6	223.3	253.6	288.2	325.3	299.7
40	182.2	227.3	257.2	293.6	332.7	307.9
45	193.0	233.9	262.4	300.8	339.8	316.3
50	205.1	239.8	267.0	308.0	347.1	326.0
55	214.8	246.4	273.0	316.9	355.0	336.8
60	223.6	254.6	275.3	325.9	363.6	348.4
65	233.1	262.0	280.3	335.3	372.7	361.0
70	243.9	271.1	286.6	347.2	382.4	373.9
75	256.1	279.1	293.4	362.2	393.6	387.6
80	269.5	289.3	304.4	378.1	406.7	402.9
85	282.9	304.0	321.8	399.3	421.8	420.9
90	302.2	329.3	344.6	428.0	441.2	440.2
95	341.1	377.9	385.2	476.6	469.3	466.6
100	435.5	512.6	502.6	570.1	523.0	507.0

Table G13 Batch 13 0.25Pd/Beta 250 with Bentonite clay (20% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	41.7	31.1	23.5	22.9	72.1	53.8
5	109.7	178.3	241.2	31.3	244.0	208.7
10	112.9	192.0	269.5	248.4	263.8	220.5
15	121.4	203.1	274.8	287.1	280.6	231.1
20	148	209.0	278.4	294.6	295.0	241.7
25	148.8	214.8	286.4	303.9	310.6	250.8
30	150.8	221.2	291.5	309.6	320.2	260.2
35	165.1	225.5	295.2	315.0	332.6	270.0
40	170.5	231.6	301.6	322.4	341.9	280.2
45	184.2	237.3	304.5	329.9	351.3	290.2
50	193.9	244.2	310.9	337.9	360.3	300.1
55	205.6	251.2	317.0	346.8	369.0	310.8
60	215.2	258.1	323.1	355.1	377.3	322.5
65	223.9	266.6	329.7	364.9	385.6	336.1
70	233.7	273.6	336.3	375.2	393.8	351.3
75	245.2	282.9	347.2	386.4	403.7	368.4
80	259.3	293.4	361.1	399.6	413.7	386.7
85	276	309.0	376.7	413.6	426.2	407.6
90	297.1	333.2	398.2	433.5	443.5	433.1
95	336.1	377.0	429.8	466.4	470.8	471.6
100	431.6	484.4	524.6	550.5	537.1	557.6

Table G14 Batch 14 0.25Pd/Beta 250 with Bentonite clay (40% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	47.2	27.1	24.2	22.5	34.9	32.2
5	110.8	189.2	224.7	32.4	253.1	223.5
10	112.6	203.2	236.8	254.9	286.8	268.5
15	129.4	210.0	247.0	271.6	303.9	283.0
20	147.5	215.6	254.2	277.7	315.6	292.9
25	148.9	222.0	260.3	286.3	324.8	301.7
30	151.0	226.4	265.7	293.5	333.6	310.4
35	166.6	232.3	272.4	300.3	342.4	319.6
40	172.0	237.6	275.2	307.1	351.0	329.5
45	186.5	243.7	281.1	315.4	359.7	341.0
50	197.9	250.3	287.5	323.3	368.8	353.5
55	207.9	256.7	292.7	331.9	377.7	367.2
60	217.2	263.7	301.0	341.4	387.3	380.1
65	225.5	271.3	309.1	353.8	397.6	393.3
70	235.8	278.1	320.0	368.0	408.7	407.3
75	247.6	286.7	331.3	382.4	419.8	420.3
80	261.1	298.2	345.8	397.9	433.5	435.7
85	276.0	313.9	367.5	413.7	450.0	453.8
90	296.4	337.8	391.6	434.4	470.5	476.0
95	336.8	380.6	426.2	465.3	499.3	507.2
100	442.5	476.9	511.1	541.5	550.8	568.7

Table G15 Batch 15 0.25Pd/Beta 250 with Ball clay (5% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	39.8	76.6	74.8	75.0	22.3	22.5
5	112.1	154.7	235.5	245.1	23.3	24.4
10	114.1	172.9	271.3	292.8	24.4	27.5
15	147.2	188.6	282.6	303.5	25.4	31.8
20	148.7	199.0	289.7	311.7	26.5	36.8
25	150.5	207.6	295.7	319.5	28.2	43.4
30	164.8	214.5	301.6	327.2	29.9	214.4
35	170.7	220.8	307.6	334.8	31.8	251.4
40	185.4	225.8	314.2	342.3	33.9	264.9
45	196.6	232.6	321.6	349.9	36.2	277.3
50	208.5	238.9	329.1	358.0	38.8	290.5
55	218.7	246.3	337.1	366.7	41.5	303.4
60	227.7	254.4	345.9	375.4	56.3	317.2
65	238.4	262.0	355.9	384.8	246.2	333.0
70	251.0	270.9	367.3	395.1	333.0	350.6
75	263.8	278.9	379.2	406.4	374.2	370.0
80	276.7	289.0	392.7	418.6	405.4	390.8
85	291.9	303.2	409.8	433.7	435.3	415.6
90	315.2	328.5	432.0	453.1	474.0	446.2
95	356.7	376.2	467.3	482.1	525.6	493.1
100	438.1	482.8	540.4	545.9	576.9	569.8

Table G16 Batch 16 0.25Pd/Beta 250 with Ball clay (20% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	41.7	40.7	188.4	78.5	85.2	75.6
5	112.7	168.0	247.8	271.7	242.4	206.0
10	115.0	183.8	260.6	284.1	261.6	218.0
15	148.0	192.2	270.4	290.7	279.1	230.7
20	148.9	202.8	274.9	297.6	294.2	242.8
25	151.0	208.6	278.2	304.5	310.4	253.0
30	165.7	214.3	285.5	309.3	320.2	265.5
35	172.3	220.8	290.4	314.8	333.1	277.4
40	187.1	225.6	294.0	321.7	342.1	288.7
45	198.7	231.8	300.7	329.0	352.0	298.6
50	209.1	237.9	303.9	336.3	361.3	309.3
55	218.8	245.0	310.7	345.1	370.0	319.6
60	227.1	252.9	317.1	353.6	378.6	331.6
65	236.7	260.4	323.9	363.6	386.7	344.9
70	247.6	269.5	330.9	374.0	395.6	358.8
75	258.5	276.9	340.3	385.5	405.6	373.8
80	271.0	286.8	354.0	398.8	415.6	389.7
85	283.5	299.8	370.6	413.1	428.6	407.7
90	301.5	322.8	391.4	433.5	445.9	429.0
95	337.8	365.6	423.6	465.2	472.8	462.7
100	424.5	466.8	512.0	540.0	540.6	545.2

Table G17 Batch 17 0.25Pd/Beta 250 with Ball clay (40% Active)

%off	Boiling point (°C)					
	Maltene	Saturated Hydrocarbons	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	71.4	159.3	219.8	40.7	22.3	43.4
5	109.1	199.3	266.8	254.8	195.9	226.2
10	114.2	212.3	275.9	298.2	269.3	257.8
15	145.4	221.1	280.4	306.4	294.7	270.1
20	147.7	228.2	285.7	313.1	317.3	278.6
25	159.1	235.3	290.2	319.7	338.3	286.2
30	168.3	241.6	294.0	326.5	352.7	293.4
35	183.6	248.7	298.0	333.4	363.6	300.6
40	194.3	255.8	302.9	340.5	372.6	307.8
45	206.8	262.7	307.6	347.7	380.5	315.0
50	217.3	269.8	313.0	355.3	388.1	323.1
55	226.8	276.6	319.0	363.3	395.9	331.9
60	237.9	283.4	326.8	371.6	403.8	341.5
65	250.5	290.7	335.0	380.3	411.9	351.9
70	262.6	299.3	344.3	390.0	420.1	363.5
75	273.0	309.7	355.7	401.0	428.7	376.6
80	284.6	323.1	369.7	413.4	438.2	391.6
85	297.4	341.9	385.3	428.2	449.3	410.7
90	315.7	370.9	407.1	448.1	463.0	434.5
95	351.1	415.7	441.5	479.1	481.5	468.4
100	439.7	523.9	526.2	544.5	510.8	525.1

Appendix H Petroleum Fractions of Derived Oils

Table H1 Petroleum fractions of derived oils obtained from each pure component

Fraction \ Catalyst	Non Cat.	Pd/Beta (Si/Al = 13.5)	Pd/Beta (Si/Al = 250)	Bentonite	Ball clay
Naphtha	28.0	43.0	43.0	39.5	37.0
Kerosene	27.0	23.0	25.0	26.5	29.0
Light Gas Oil	19.0	20.0	18.8	20.0	20.0
Heavy Gas Oil	15.5	9.0	9.2	10.0	10.0
Residues	10.5	5.0	4.0	4.0	4.0

Table H2 Petroleum fractions of derived oils obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of bentonite clay

Fraction \ Catalyst	5% active	20% active	40% active	Pd/Beta (Si/Al = 13.5)
Naphtha	46.5	46.0	47.0	43.0
Kerosene	25.5	26.0	25.0	23.0
Light Gas Oil	16.0	16.0	17.0	20.0
Heavy Gas Oil	8.5	8.0	7.5	9.0
Residues	3.5	4.0	3.5	5.0

Table H3 Petroleum fractions of derived oils obtained from the Pd/Beta based extrudates (Si/Al = 13.5) composed of ball clay

Fraction \ Catalyst	5% active	20% active	40% active	Pd/Beta (Si/Al = 13.5)
Naphtha	45.0	48.5	50.0	43.0
Kerosene	22.5	24.5	25.0	23.0
Light Gas Oil	21.0	16.0	16.0	20.0
Heavy Gas Oil	10.5	7.5	6.5	9.0
Residues	6.0	3.5	2.5	5.0

Table H4 Petroleum fractions of derived oils obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of bentonite clay

Fraction \ Catalyst	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Naphtha	48.0	52.5	51.5	43.0
Kerosene	24.5	24.5	24.5	25.0
Light Gas Oil	16.5	13.5	14.0	18.8
Heavy Gas Oil	7.5	6.0	6.5	9.2
Residues	3.5	3.5	3.5	4.0

Table H5 Petroleum fractions of derived oils obtained from the Pd/Beta based extrudates (Si/Al = 250) composed of ball clay

Fraction \ Catalyst	5% active	20%active	40%active	Pd/Beta (Si/Al = 250)
Naphtha	46.0	46.0	42.5	43.0
Kerosene	23.0	25.0	22.5	25.0
Light Gas Oil	17.0	19.0	21.0	18.8
Heavy Gas Oil	10.0	6.0	10.0	9.2
Residues	4.0	4.0	4.0	4.0

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