

Correlating Feed Characteristics and Catalyst Properties with Fluid Catalytic Cracking Performance

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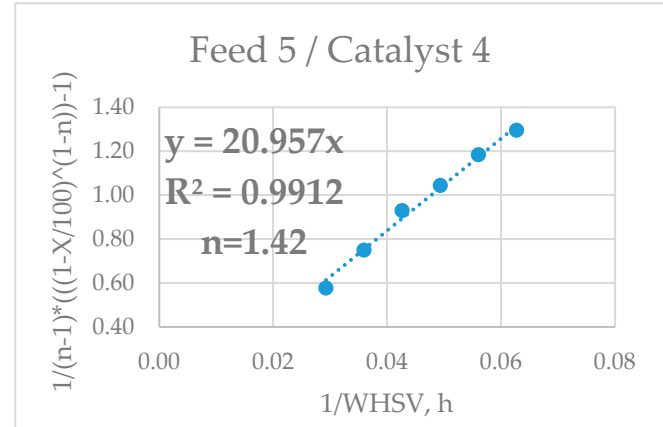
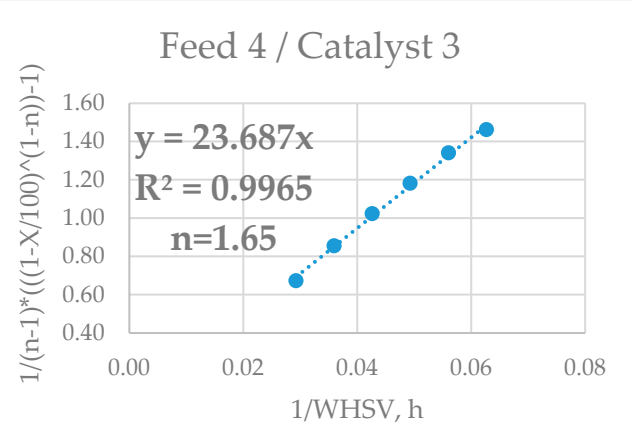
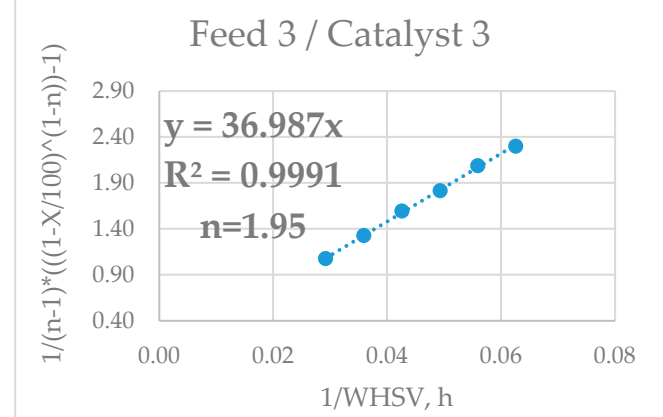
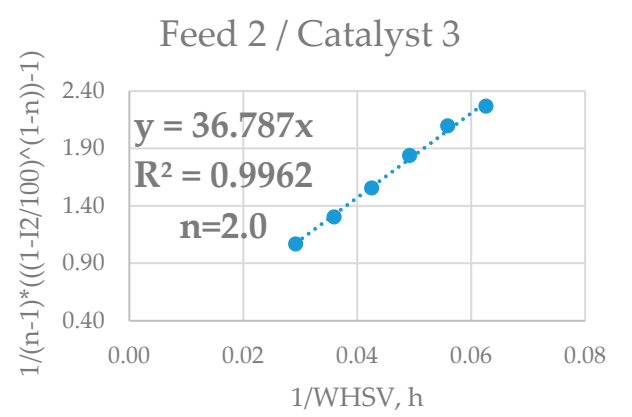
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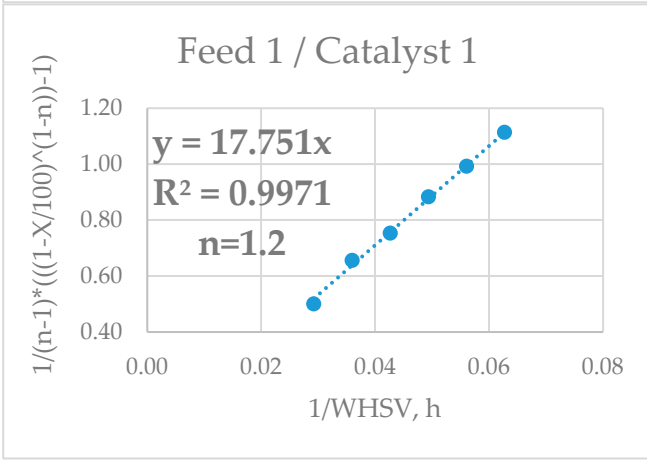
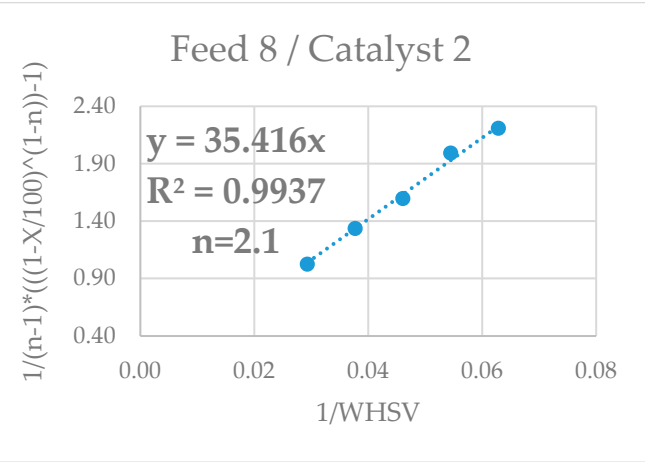
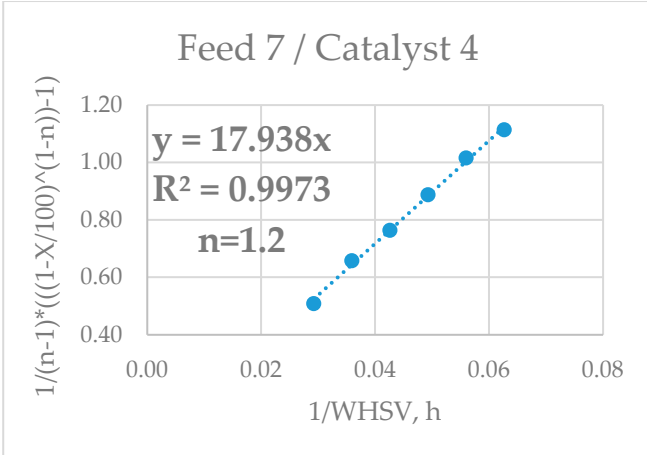
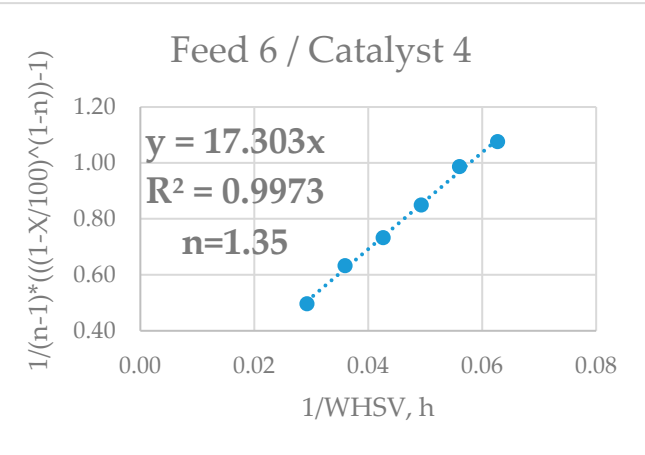
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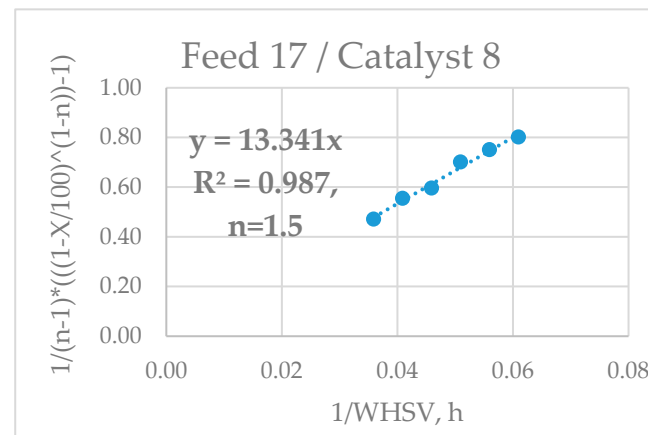
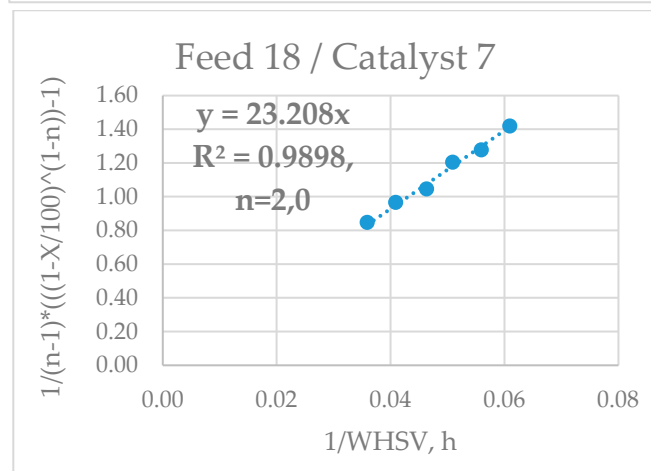
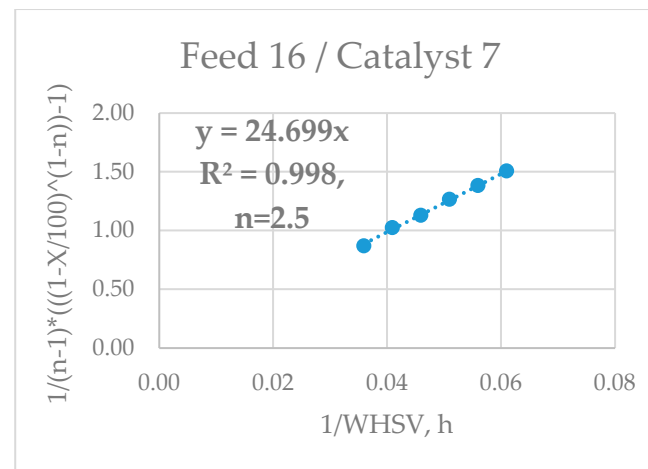
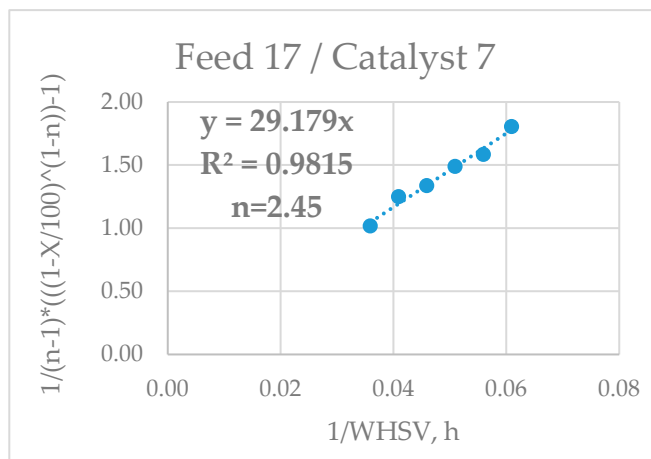
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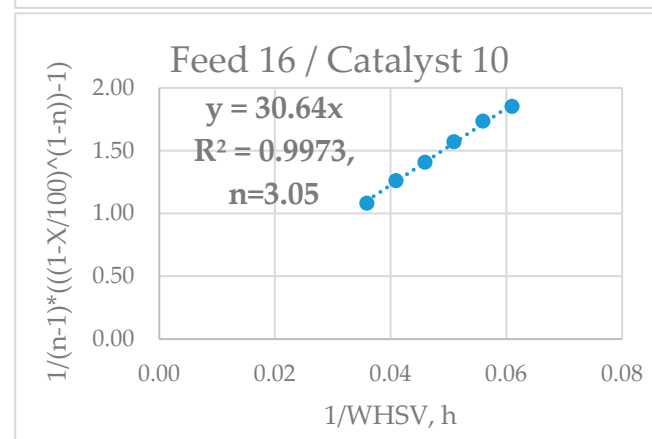
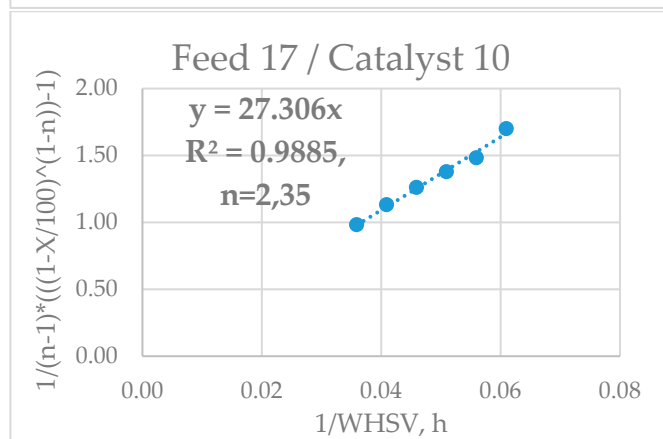
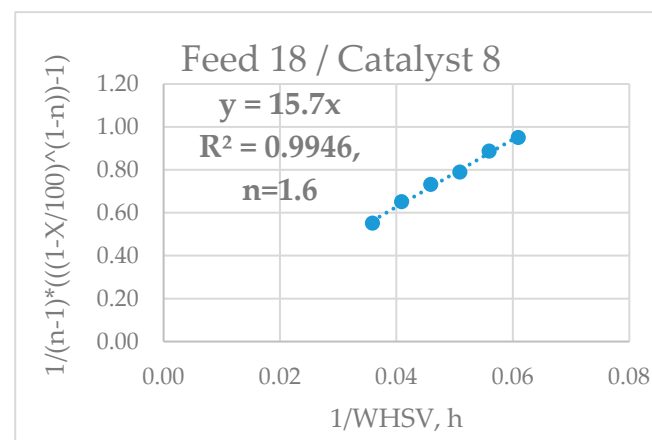
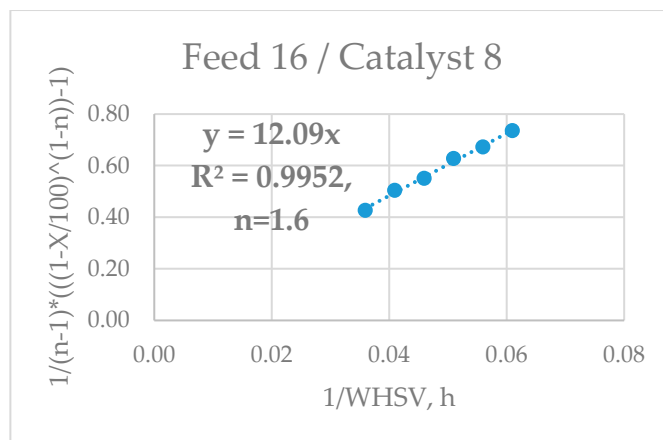
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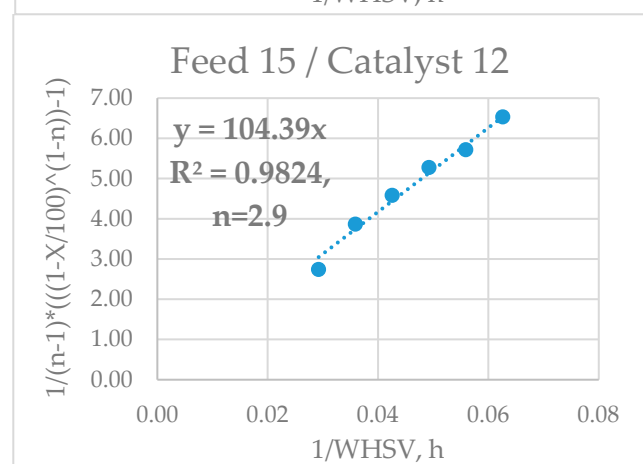
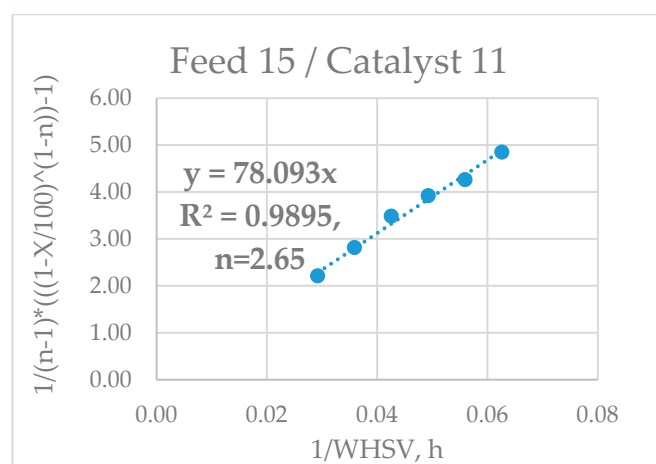
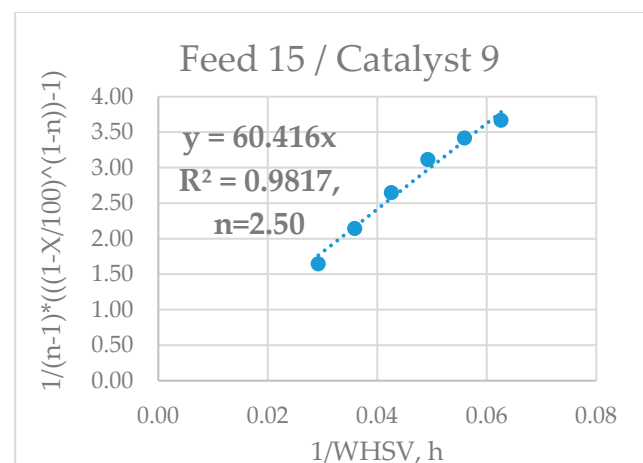
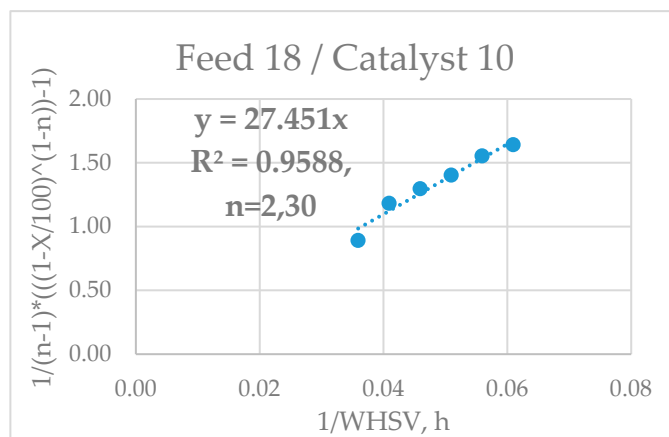
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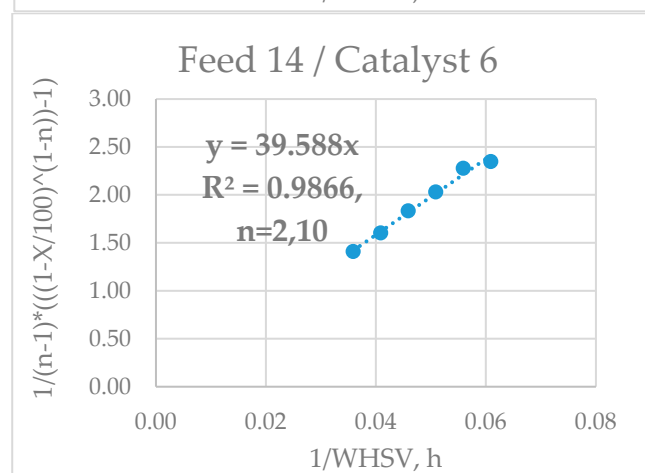
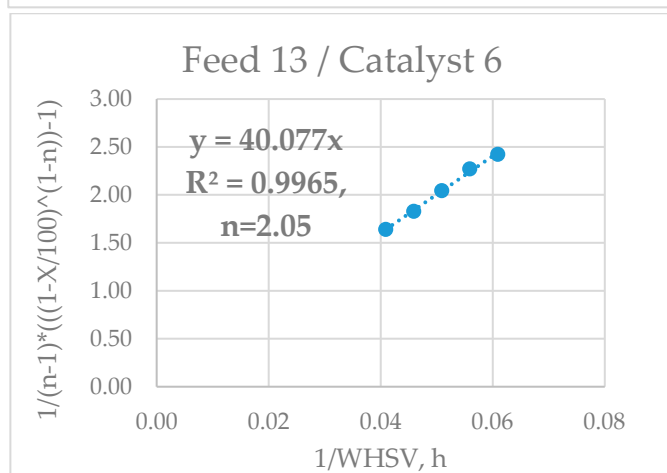
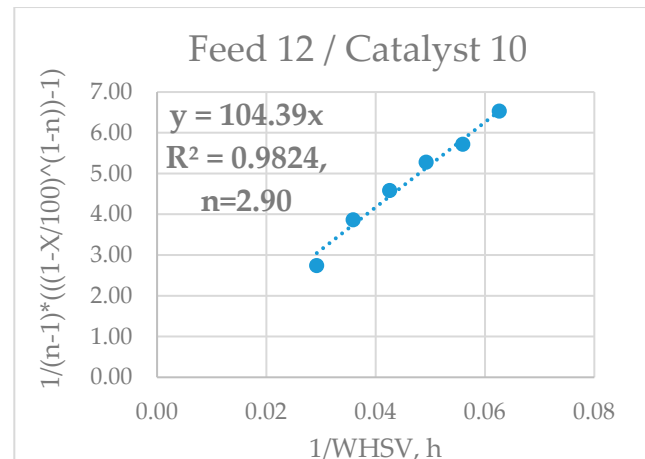
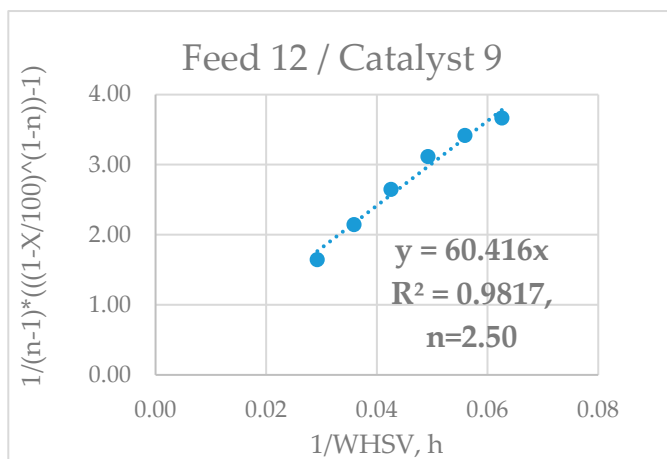


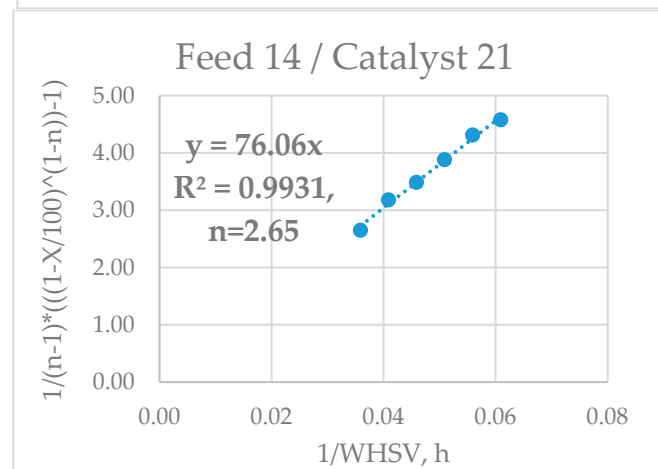
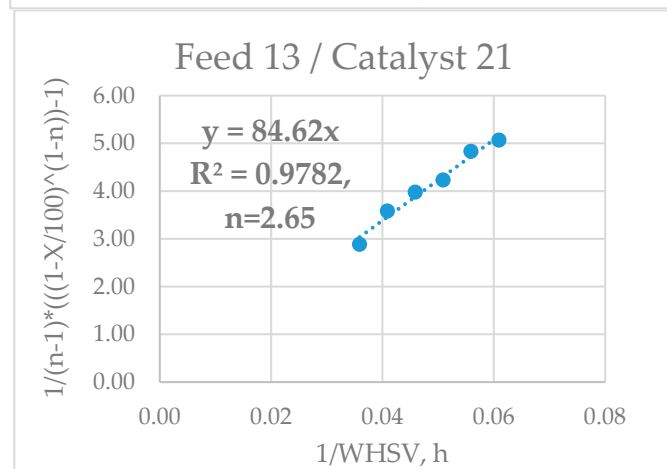
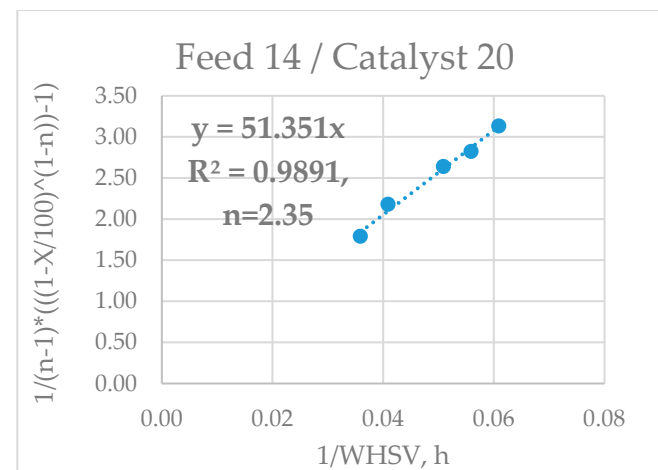
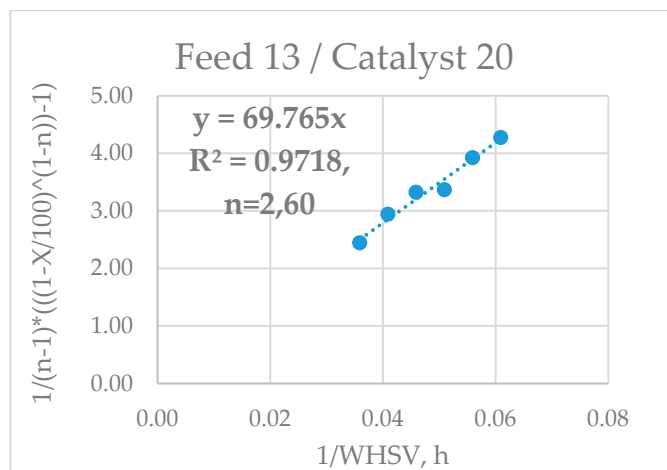


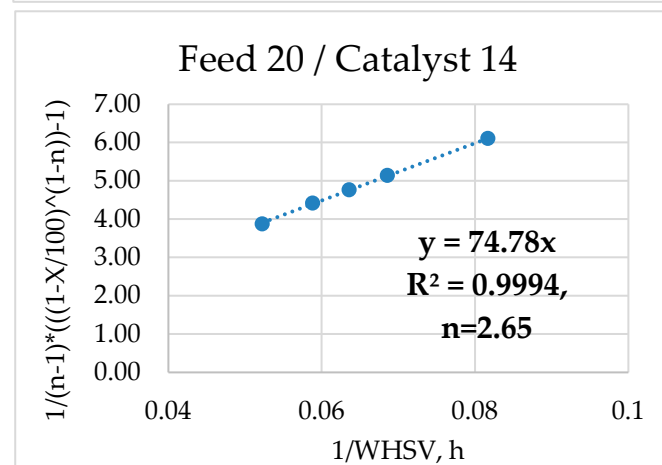
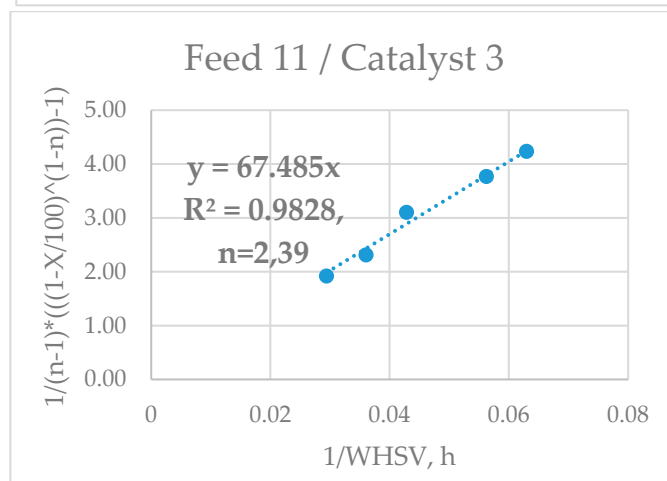
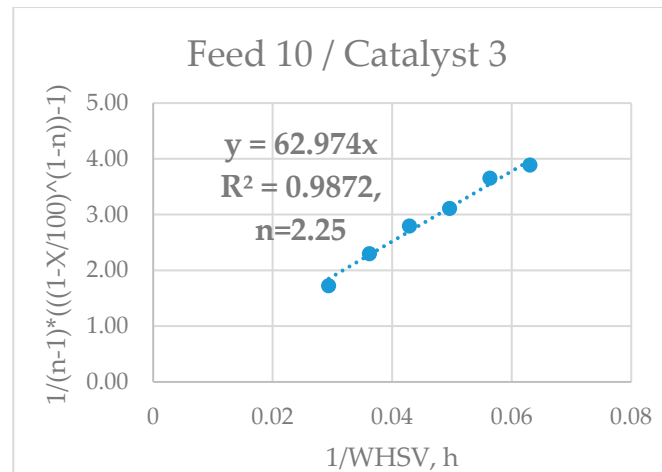
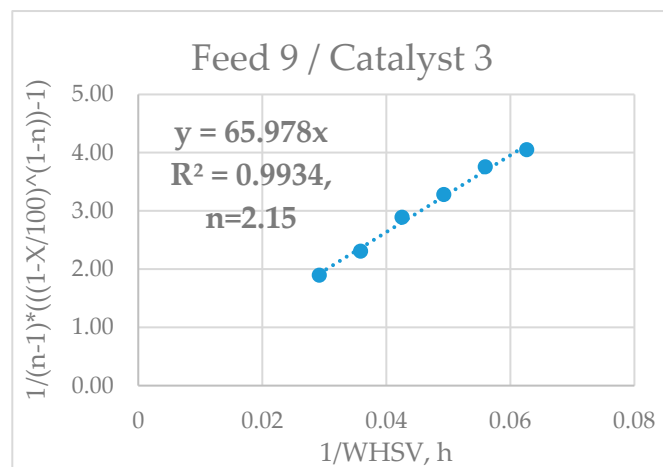


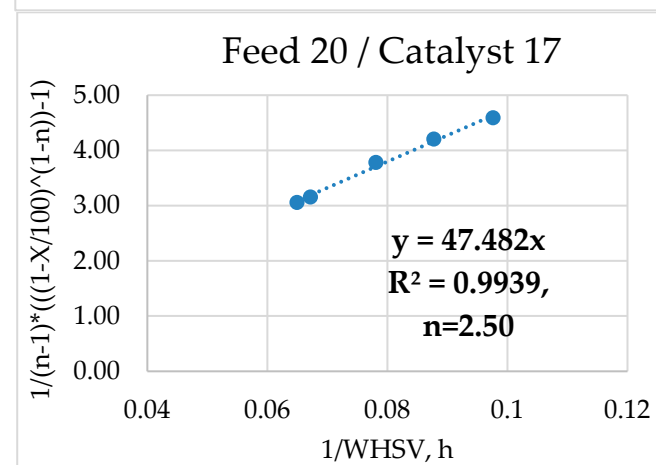
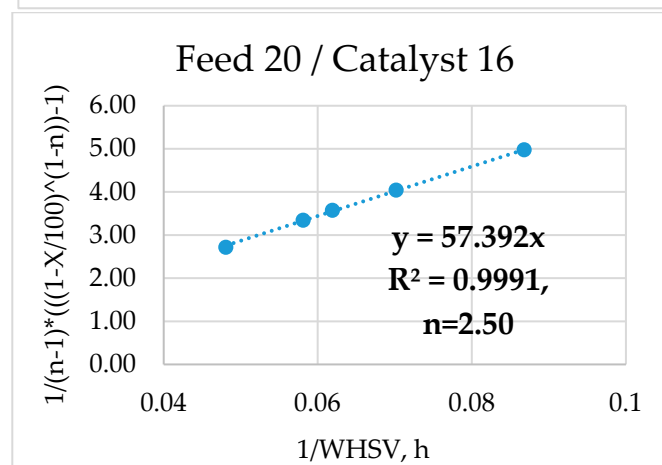
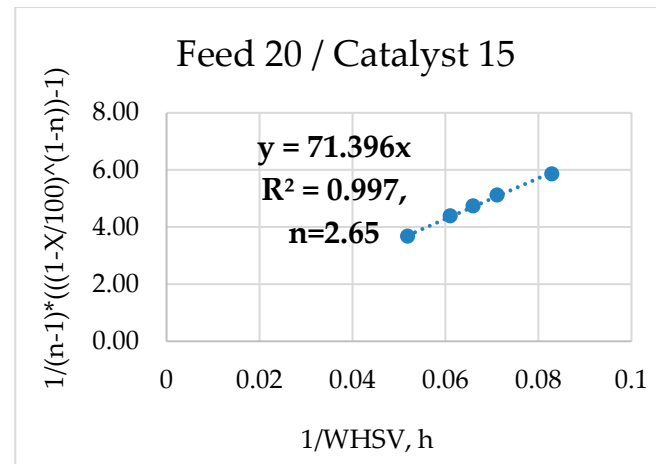
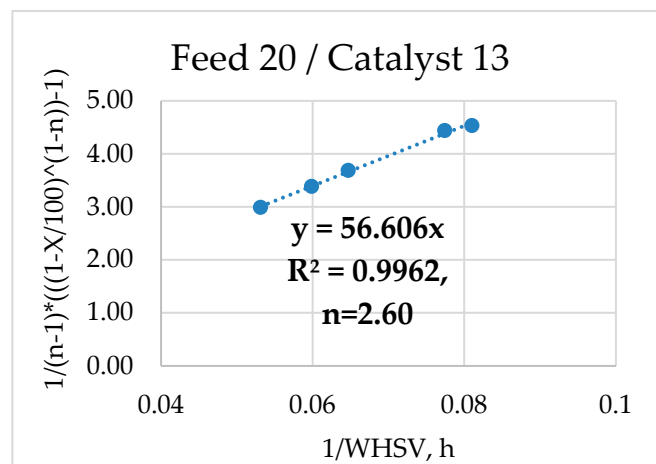












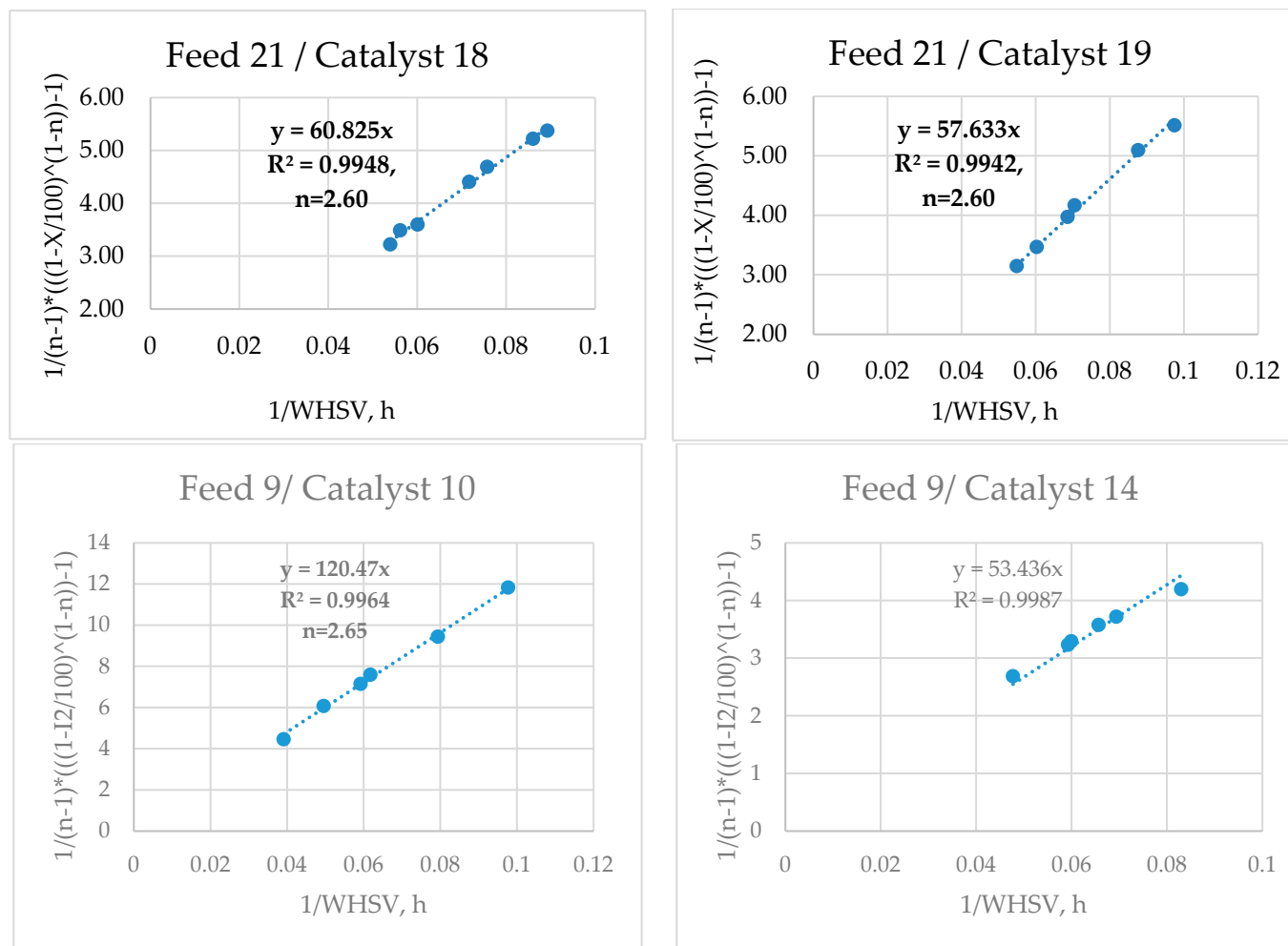


Figure S1. Graphs indicating the best fit order of reaction and the apparent kinetic constant for the examined 21 FCC feeds cracked on the 21 studied catalysts (41 feed/catalyst cases were cracked in this study) in an ACE FCC unit.

Table S1. Feed and catalyst properties, which most affect conversion along with the conversion level at CTO of 7.5 wt./wt. and that calculated by Eq. (3) obtained in an ACE FCC unit.

No	Feed/Catalyst Case	Calculated by Eq. (3) conversion	Conversion at 7.5 CTO, wt.%	Feed K_w	feed N , wt.%	MA , wt.%
1	Feed 1 / Catalyst 1	64.2	63.4	11.67	0.270	73.2
2	Feed 2 / Catalyst 3	69.7	69.4	11.83	0.200	73.8
3	Feed 3 / Catalyst 3	71.5	70.5	11.92	0.190	73.8
4	Feed 4 / Catalyst 3	65.4	64.2	11.72	0.275	73.8
5	Feed 5 / Catalyst 4	64.3	64.4	11.83	0.354	73.3
6	Feed 6 / Catalyst 4	60.4	59.9	11.61	0.359	73.3
7	Feed 7 / Catalyst 4	63.9	63.4	11.76	0.333	73.3
8	Feed 8 / Catalyst 2	67.5	67.4	11.83	0.250	73.2
9	Feed 9 / Catalyst 3	77.4	77.8	12.06	0.080	73.8
10	Feed 10 / Catalyst 3	73.7	75.7	11.92	0.120	73.8
11	Feed 11 / Catalyst 3	72.3	75.0	11.82	0.110	73.8
12	Feed 12 / Catalyst 9	72.5	71.3	11.99	0.123	71.0
13	Feed 12 / Catalyst 10	75.1	74.5	11.99	0.123	74.0
14	Feed 13 / Catalyst 6	70.2	70.0	11.92	0.157	71.0
15	Feed 14 / Catalyst 6	69.8	68.6	11.89	0.150	71.0
16	Feed 13 / Catalyst 20	72.1	72.4	11.92	0.157	73.3
17	Feed 14 / Catalyst 20	71.8	70.6	11.89	0.150	73.3
18	Feed 13 / Catalyst 21	74.4	74.2	11.92	0.157	76.0
19	Feed 14 / Catalyst 21	74.1	72.8	11.89	0.150	76.0
20	Feed 15 / Catalyst 9	70.8	71.3	11.92	0.140	71.0
21	Feed 15 / Catalyst 11	72.9	73.6	11.92	0.140	73.5
22	Feed 15 / Catalyst 12	74.6	74.5	11.92	0.140	75.5
23	Feed 16 / Catalyst 10	54.4	53.5	11.08	0.310	75.0
24	Feed 17 / Catalyst 10	58.5	58.7	11.19	0.246	75.0
25	Feed 18 / Catalyst 10	59.6	58.5	11.33	0.284	75.0
26	Feed 18 / Catalyst 8	52.7	52.9	11.33	0.284	67.0
27	Feed 16 / Catalyst 8	47.6	45.6	11.08	0.310	67.0
28	Feed 17 / Catalyst 8	51.6	49.1	11.19	0.246	67.0
29	Feed 16 / Catalyst 7	54.6	54.5	11.08	0.310	75.2
30	Feed 17 / Catalyst 7	58.6	58.8	11.19	0.246	75.2
31	Feed 18 / Catalyst 7	59.8	58.7	11.33	0.284	75.2
32	Feed 19 / Catalyst 2	70.3	71.2	11.86	0.180	73.2
33	Feed 20 / Catalyst 13	71.6	71.8	11.75	0.166	76.3
34	Feed 20 / Catalyst 14	67.5	68.2	11.75	0.166	71.5
35	Feed 20 / Catalyst 15	70.6	71.1	11.75	0.166	75.2
36	Feed 20 / Catalyst 16	69.8	69.8	11.75	0.166	74.2
37	Feed 20 / Catalyst 17	65.3	66.0	11.75	0.166	69.0
38	Feed 21 / Catalyst 18	74.0	73.7	11.90	0.094	73.5
39	Feed 21 / Catalyst 19	73.1	72.8	11.90	0.094	72.5
40	Feed 9/ Catalyst 10	78.5	79.4	12.06	0.080	75.0

41	Feed 9/ Catalyst 14	76.8	77.1	12.06	0.080	73.0
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Table S2. Feed and catalyst properties used during the commercial FCC unit experiments, together with the conversion level at CTO of 7.5 wt./wt. and that calculated by Eq. (5).

No	Calculated by Eq. (5) conversion, wt.%	Conversion at CTO of 7.5 wt./wt.	Kw	Nitrogen content, wt.%	Micro- activity, wt.%
1	74.3	74.1	11.77	0.16571	76
2	70.2	70.52	11.77	0.16571	71
3	73.5	73.47	11.77	0.16571	75
4	71.9	71.98	11.77	0.16571	73
5	68.6	68.38	11.77	0.16571	69
6	79.3	79.4	11.98	0.12275	74
7	76.9	77.3	11.98	0.12275	71
8	76.9	76.6	11.98	0.12275	71
9	76.9	76.8	11.98	0.12275	71
10	73.6	73.6	11.93	0.147	70
11	75.1	74.29	11.87	0.157	74
12	78.0	78.44	11.973	0.14093	74