Supplementary Information

In this electronic Supporting Information, additional data are given on characterization data, catalytic performance and results after recycling.

Figure S1 shows the XRD patterns of 1 wt. % Pt/SiO_2, 5 wt. % Pt/SiO_2 and 1 wt. % Pt/H-MFI-90 in its calcined and reduced state, as well as after the catalytic measurements. The data indicated a slight sintering of the Pt crystallites after reduction and an enhanced sintering after catalytic tests. In Figure S2, the total NH_3 consumption of a fresh and a used (at 250 °C) 1 wt. % Pt/H-MFI-90 is shown. The data evidence a lower NH_3 consumption of the used catalyst, especially a decrease in the strong adsorption peak and, thereby, also a decreasing acidity for the used sample. In Table 2, the properties of the catalysts (carbon deposition, particle size, as well as weak and strong NH_3 absorption) after the catalytic measurement at 250, 200 and 150 °C were summarized.

Figure S3 shows the stability of the hydrodeoxygenation of guaiacol in 1-octanol over 1 wt. % Pt/H-MFI-90 performed at a lower temperature (150 °C and 200 °C) (in analogy to Figure 3 in the main publication). Compared to the results at 250 °C (Figures 3a and 3b in the main publication), the catalyst deactivates from the beginning on, and after 30 h time-on-stream, the catalyst is completely deactivated at 200 °C.

Figure S4 gives additional TPO data for catalysts used for the hydrodeoxygenation of guaiacol in 1-octanol over 1 wt. % Pt/H-MFI-90 performed at a lower temperature (150 °C and 200 °C) (in analogy to Figure 3 in the main publication).

Tables S1–S7 give the catalytic data complementary to those given in the manuscript figures as the conversion and yields of the corresponding products in tabular format.

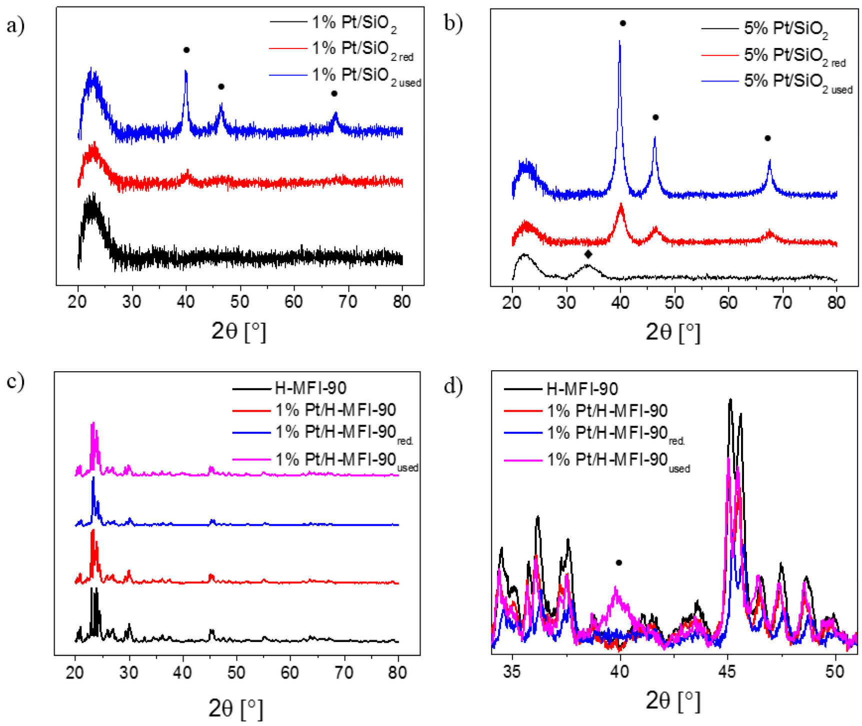

Figure S1. X-ray diffraction patterns of (**a**) 1 wt. % Pt/SiO_2 before and after the reaction, (**b**) 5 wt. % Pt/SiO_2 before and after the reaction and (**c**,**d**) H-MFI-90 and 1 wt. % Pt/H-MFI-90 before and after the reaction. The reflections of platinum (●) and platinum oxide (♦) are marked in the diffraction patterns.

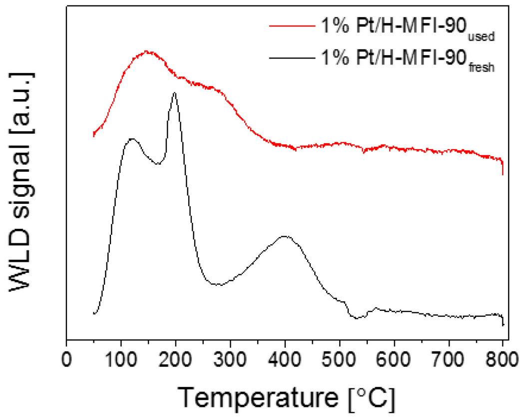

Figure S2. NH_3-temperature programmed desorption (TPD) of 1 wt. % Pt/H-MFI-90 before and after the measurement at 250 °C.

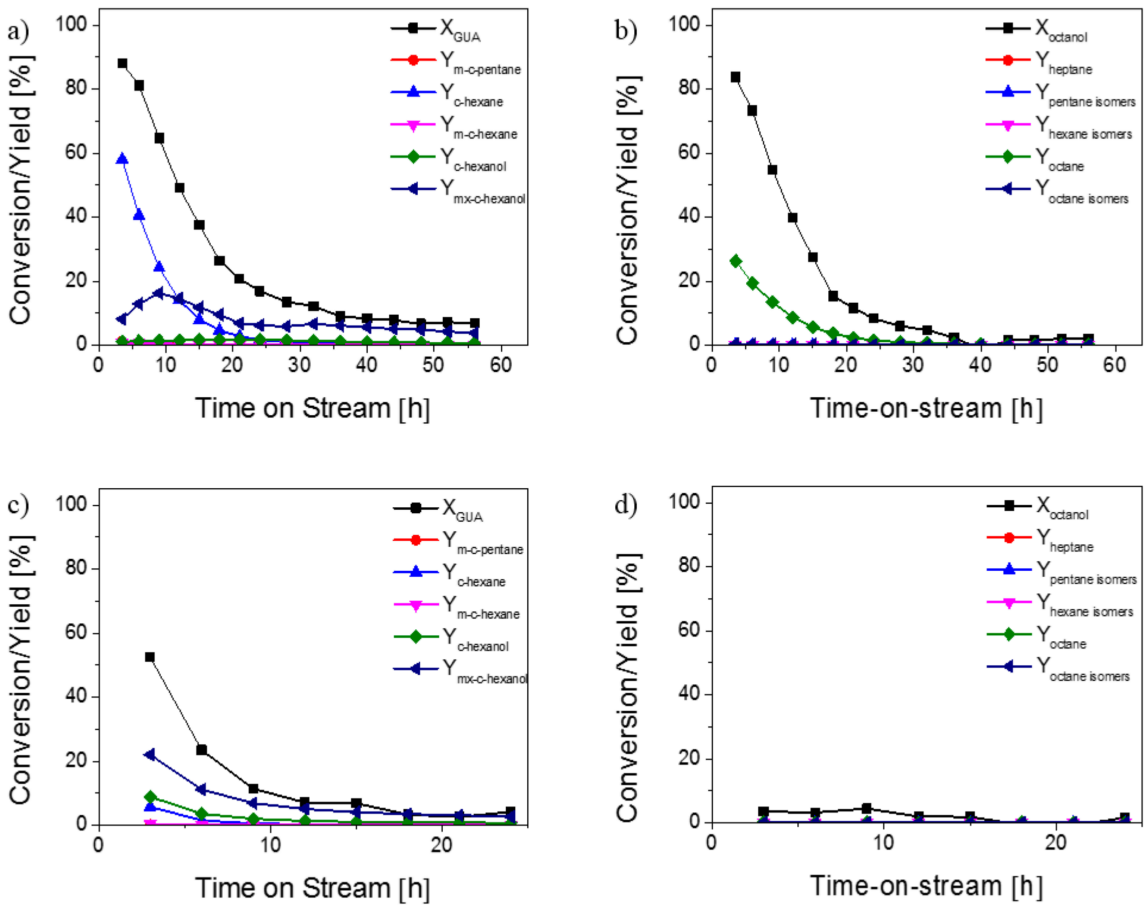

Figure S3. Stability of guaiacol (**a**,**c**) and 1-octanol (**b**,**d**) over 1 wt. % Pt/H-MFI-90 at (**a**,**b**) 200 °C and (**c**,**d**) 150 °C (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 20% H_2/N_2, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

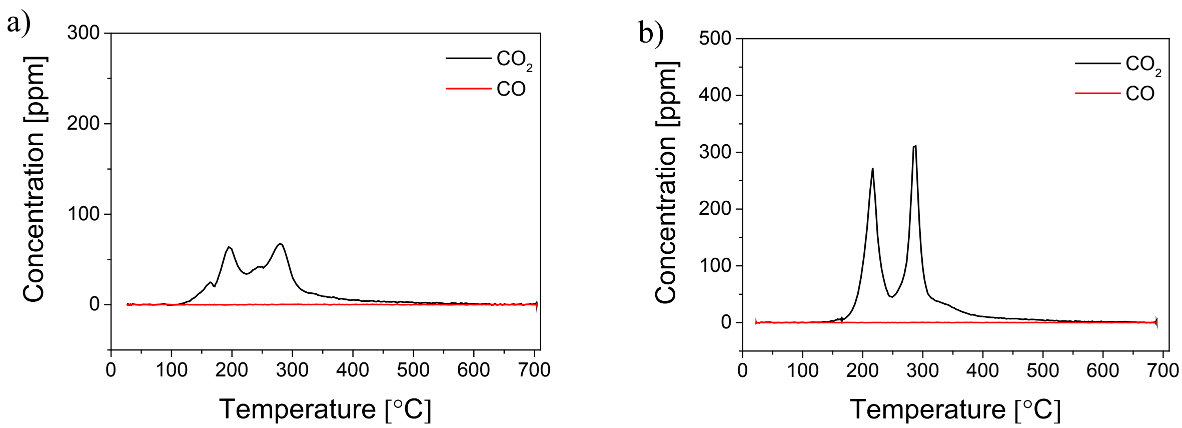

Figure S4. Results of the temperature programmed oxidation of 1 wt. % Pt/H-MFI-90 after the catalytic measurement at (**a**) 150 °C and (**b**) 200 °C (conditions: 1 L/min 10% O_2 in N_2, T = 25–700 °C, 5 K/min, 10 mg catalyst).

Table S1. Conversion of guaiacol and 1-octanol over 5 wt. % Pt/SiO_2 as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2 in N_2, T = 250 °C, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

Time	**GUA Balance**	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	**Octanol Balance**	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(h)	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
3	93	54	0	0	0	2	42	97	3	0	0	0	0	0
6	95	51	0	0	0	2	42	97	3	0	0	0	0	0
9	97	48	0	0	0	3	40	101	0	0	0	0	0	0
12	97	48	0	0	0	3	40	102		0	0	0	0	0
15	95	48	0	0	0	3	39	98	2	0	0	0	0	0
18	97	47	0	0	0	3	39	102	0	0	0	0	0	0
21	96	47	0	0	0	3	38	100	0	0	0	0	0	0
24	95	47	0	0	0	3	37	97	3	0	0	0	0	0
27	98	45	0	0	0	3	38	103	0	0	0	0	0	0
30	98	45	0	0	0	3	37	102	0	0	0	0	0	0
33	98	44	0	0	0	3	37	103	0	0	0	0	0	0
36	97	43	0	0	0	3	35	97	3	0	0	0	0	0
39	98	43	0	0	0	3	36	102	0	0	0	0	0	0
42	98	42	0	0	0	3	35	102	0	0	0	0	0	0
46	98	40	0	0	0	3	34	102	0	0	0	0	0	0
50	98	39	0	0	0	3	32	102	0	0	0	0	0	0
54	98	38	0	0	0	3	31	102	0	0	0	0	0	0
58	98	37	0	0	0	3	31	102	0	0	0	0	0	1
62	96	38	0	0	0	3	29	98	2	0	0	0	0	1
66	98	40	0	0	0	3	33	102	0	0	0	0	0	3
70	99	38	0	0	0	3	32	103	0	0	0	0	0	3
74	96	37	0	0	0	3	28	98	3	0	0	0	0	3
78	96	35	0	0	0	2	27	98	3	0	0	0	0	4
82	101	30	0	0	0	2	27	103	0	0	0	0	0	4

Table S2. Conversion of guaiacol and 1-octanol over 1 wt. % Pt/SiO_2 as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2 in N_2, T = 250 °C, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

Time	GUA Balance	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	Octanol Balance	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(h)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
3	91	35	2	13	3	1	6	94	40	0	0	0	29	0
6	95	13	0	1	0	1	7	96	6	0	0	0	2	0
9	100	7	0	0	0	0	6	100	0	0	0	0	1	0
16	97	7	0	0	0	0	3	97	3	0	0	0	0	0
21	102	3	0	0	0	0	5	103	0	0	0	0	0	0

Table S3. Conversion of guaiacol and 1-octanol over 1 wt. % Pt/H-MFI-90 as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2 in N_2, T = 250 °C, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

Time	GUA Balance	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	Octanol Balance	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(h)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
3	99	95	24	48	19	3	1	94	96	0	3	0	71	17
6	95	97	21	49	18	3	0	93	100	0	2	0	73	17
9	97	96	22	50	18	3	0	94	100	0	2	0	74	17
13	102	94	23	49	19	3	0	97	100	0	2	0	77	18
17	96	92	20	48	17	3	0	96	100	0	2	0	77	16
21	97	90	19	49	16	3	0	97	100	0	2	0	79	16
25	97	87	16	52	13	2	0	100	100	0	1	0	84	15
27	99	84	18	46	15	3	0	101	100	1	2	0	82	17
33	88	55	7	26	6	2	2	86	71	0	0	0	48	8
37	99	10	0	1	0	1	7	98	4	0	0	0	2	0
41	99	8	0	0	0	0	6	97	4	0	0	0	1	0
45	95	10	0	0	0	0	4	93	7	0	0	0	0	0
49	96	8	0	0	0	0	4	95	5	0	0	0	0	0

Table S4. Catalytic activity of 1 wt. % Pt/H-MFI-90 in the hydrodeoxygenation of guaiacol and 1-octanol as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2/N_2, T = 200 °C, p = 100 bar, 2.5 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

Time	**GUA Balance**	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	**Octanol Balance**	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(h)	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
3.5	87	88	1	58	1	1	8	79	84	0	0	0	26	0
6	84	81	1	40	1	1	13	80	73	0	0	0	19	0
9	88	65	1	24	0	1	16	87	55	0	0	0	13	0
12	89	49	0	14	0	2	15	87	40	0	0	0	9	0
15	90	38	0	8	0	2	12	90	28	0	0	0	6	0
18	94	26	0	5	0	2	10	98	15	0	0	0	4	0
21	93	21	0	3	0	2	7	97	12	0	0	0	2	0
24	95	17	0	2	0	2	6	97	8	0	0	0	2	0
28	96	14	0	1	0	1	6	98	6	0	0	0	1	0
32	97	13	0	1	0	1	7	98	5	0	0	0	1	0
36	99	9	0	0	0	1	6	100	2	0	0	0	0	0
40	97	10	0	0	0	1	5	98	4	0	0	0	0	0
44	99	8	0	0	0	1	5	100	2	0	0	0	0	0
48	100	7	0	0	0	1	5	99	2	0	0	0	0	0
52	98	7	0	0	0	1	4	99	2	0	0	0	0	0
56	98	7	0	0	0	1	4	99	2	0	0	0	0	0

Table S5. Conversion of guaiacol and 1-octanol over 1 wt. % Pt/H-MFI-90 as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2 in N_2, T = 150 °C, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

Time	GUA Balance	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	Octanol Balance	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(h)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
3	93	52	0	6	0	9	22	98	4	0	0	0	0	0
6	96	23	0	1	0	4	11	98	3	0	0	0	0	0
9	99	11	0	1	0	2	7	96	4	0	0	0	0	0
12	100	7	0	0	0	1	5	99	2	0	0	0	0	0
15	99	7	0	0	0	1	4	99	2	0	0	0	0	0
18	102	3	0	0	0	1	3	101	0	0	0	0	0	0
21	102	3	0	0	0	1	3	101	0	0	0	0	0	0
24	100	4	0	0	0	1	3	99	2	0	0	0	0	0

Table S6. Conversion of guaiacol and 1-octanol over 1 wt. % Pt/H-MFI-$90_{rec.}$ as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2 in N_2, T = 250 °C, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

Time	GUA Balance	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	Octanol Balance	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(h)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
3	91	35	2	13	3	1	6	94	40	2	13	3	1	6
6	95	13	0	1	0	1	7	96	6	0	1	0	1	7
9	100	7	0	0	0	0	6	100	0	0	0	0	0	6
13	97	7	0	0	0	0	3	97	3	0	0	0	0	3
17	102	3	0	0	0	0	5	103	0	0	0	0	0	5
21	102	2	0	0	0	0	4	102	0	0	0	0	0	4

Table S7. Conversion of guaiacol and 1-octanol over 1 wt. % Pt/H-MFI-90$_{rec.}$ as a function of the temperature (conditions: 0.3 mL/min 5% GUA in 1-octanol, 500 mL/min 80% H_2 in N_2, T = 50–250 °C, p = 100 bar, 1 g catalyst; GUA = guaiacol, m = methyl, mx = methoxy, c = cyclo).

T	GUA Balance	X_{GUA}	$Y_{m\text{-}c\text{-}pentan}$	$Y_{c\text{-}hexan}$	$Y_{m\text{-}c\text{-}hexan}$	$Y_{c\text{-}hexanol}$	$Y_{mx\text{-}c\text{-}hexanol}$	Octanol Balance	$X_{Octanol}$	$Y_{heptane}$	$Y_{pentane\ isomers}$	$Y_{hexane\ isomers}$	Y_{octane}	$Y_{octane\ isomers}$
(°C)	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
250	97	99	22	49	19	3	0	93	100	0	2	0	73	16
200	94	100	3	88	0	1	0	102	100	0	0	0	100	2
150	91	41	0	6	0	4	14	99	4	0	0	0	1	0
100	95	7	0	0	0	0	1	95	5	0	0	0	0	0
50	102	0	0	0	0	0	1	104	0	0	0	0	0	0