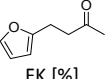
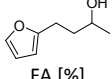
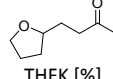
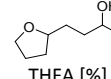
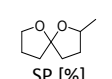
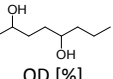


Supporting Information

1. Comparison of different Catalysts for the FFA Hydrogenation

Table S1 Comparison of different metal catalysts in the Hydrogenation of furfuralacetone.^a

Entry	Catalyst	 FK [%]	 FA [%]	 THFK [%]	 THFA [%]	 SP [%]	 OD [%]
1	Ru/C	0	0	0	88	8	3
2	Ru/Al ₂ O ₃	0	0	5	89	0	5
3	Ru/SiO ₂	1	1	47	47	4	1
4	Pd/C	0	4	0	67	28	1
5	Ni/SiO ₂	7	14	12	64	2	1
6	Rh/SiO ₂	0	0	85	15	0	0
7 ^b	CuCr ₂ O ₅	0	89	0	3	8	0
8 ^c	-	0	0	0	0	0	0

^aConditions: FFA (0.75 mmol), Ru/C (3.75 μmol), cyclohexane (1,5 mL), H₂ (40 bar), 100 °C, 2 h. ^b120 °C, 6 h. ^cno conversion observed without a catalyst.

2. Optimization of the THFA deoxygenation

Table S2 Optimization of the deoxygenation of THFA based on a design of experiment approach.^a

Entry	Temperature [°C]	Sub/ H ⁺	Sub/Ru	time [h]	pressure [bar]	Conversion [%]	BTHF [%]	Dimers [%]	1-OL [%]	PTHP + MP ₂ THF [%]
1	140	3	50	4	80	100	64	23	1	11
2	140	3	50	6	40	100	70	17	3	10
3	140	3	200	4	40	100	61	30	4	6
4	140	3	200	6	80	100	67	20	5	8
5	140	15	50	4	40	85	41	36	1	7
6	140	15	50	6	80	93	48	36	2	7
7	140	15	200	4	80	91	48	35	2	6
8	140	15	200	6	40	96	56	32	2	6
9	160	3	50	4	40	100	77	0	8	14
10	160	3	50	6	80	100	74	0	8	18
11	160	3	200	4	80	100	77	3	8	12
12	160	3	200	6	40	100	72	0	7	18
13	160	15	50	4	80	98	74	13	2	10
14	160	15	50	6	40	100	82	6	0	12
15	160	15	200	4	40	100	79	8	5	8
16	160	15	200	6	80	100	80	4	7	9

^aConditions: THFA (0.75 mmol), Ru/C, Dowex 50WX8, H₂, cyclohexane (1,5 mL).

Table S3 Variation of ion exchange resin and temperature in the deoxygenation of THFA.^a

Entry	Ion exchange resin	Temperature [°C]	BTHF [%]	Dimers [%]	1-OL [%]	PTHP + MPTHF [%]
1	Dowex 50	160	80	4	7	9
2	Dowex 50	150	67	23	4	5
3	Amberlyst 36	160	86	0	7	9
4	Amberlyst 36	150	92	0	5	3

^aConditions: THFA (0.75 mmol), Ru/C (3.75 μ mol Ru), ion exchange resin (0.05 mmol H⁺), H₂ (80 bar), 6 h, cyclohexane (1.5 mL).

Table S4 Influence of the amount of Ru/C on the deoxygenation of THFA.^a

Entry	Ru/C [mol% Ru]	BTHF [%]	Dimers [%]	1-OL [%]	PTHP + MPTHF [%]	Others ^b [%]
1	0.5	91	1	4	4	0
2	1.0	90	2	4	3	2
3	2.0	87	1	3	3	6
4	5.0	74	0	0	3	23

^aConditions: THFA (0.38 mmol), Ru/C, ion exchange resin (0.05 mmol H⁺), H₂ (80 bar), 150 °C, 4 h, cyclohexane (1.5 mL). ^bOthers include Heptane, Octane and Methylene tetrahydrofuran.

3. Catalyst Deactivation in the Continuous Flow Hydrogenation of FFA

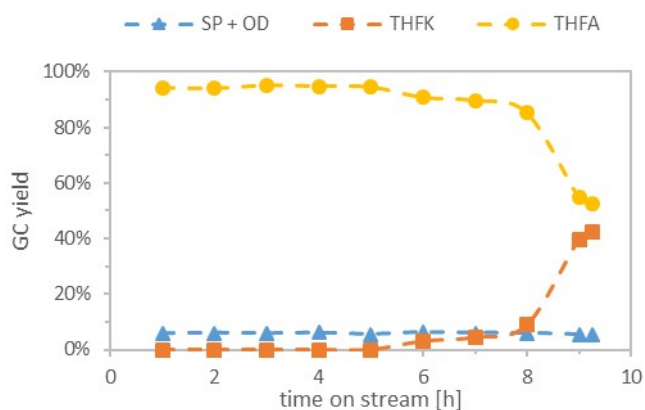


Fig. S1 Continuous Flow Hydrogenation of a FFA (0.25 mol/L) solution in cyclohexane at 80 °C. Conditions: catalyst bed: 1 g Ru/C, 80 °C, substrate flowrate: 1 mL/min, hydrogen flowrate: 37 mL_N/min, pressure: 80 bar.

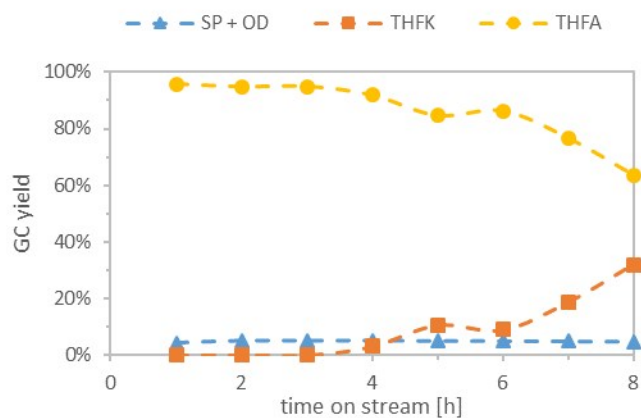


Fig. S2 Continuous Flow Hydrogenation of a FFA (0.25 mol/L) solution in cyclohexane at 100 °C. Conditions: catalyst bed: 1 g Ru/C, 100 °C, substrate flowrate: 1 mL/min, hydrogen flowrate: 37 mL_N/min, pressure: 80 bar.

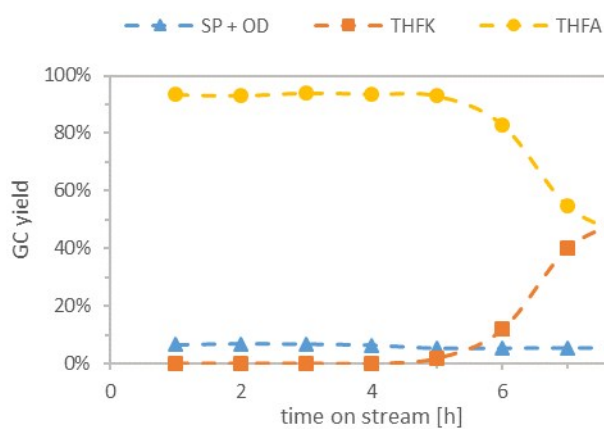


Fig. S3 Continuous Flow Hydrogenation of a FFA (0.25 mol/L) solution in cyclohexane at 120 °C. Conditions: catalyst bed: 1 g Ru/C, 120 °C, substrate flowrate: 1 mL/min, hydrogen flowrate: 37 mL_h/min, pressure: 80 bar.

4. Characterization of the Ru/C-Catalyst Before and After Catalysis

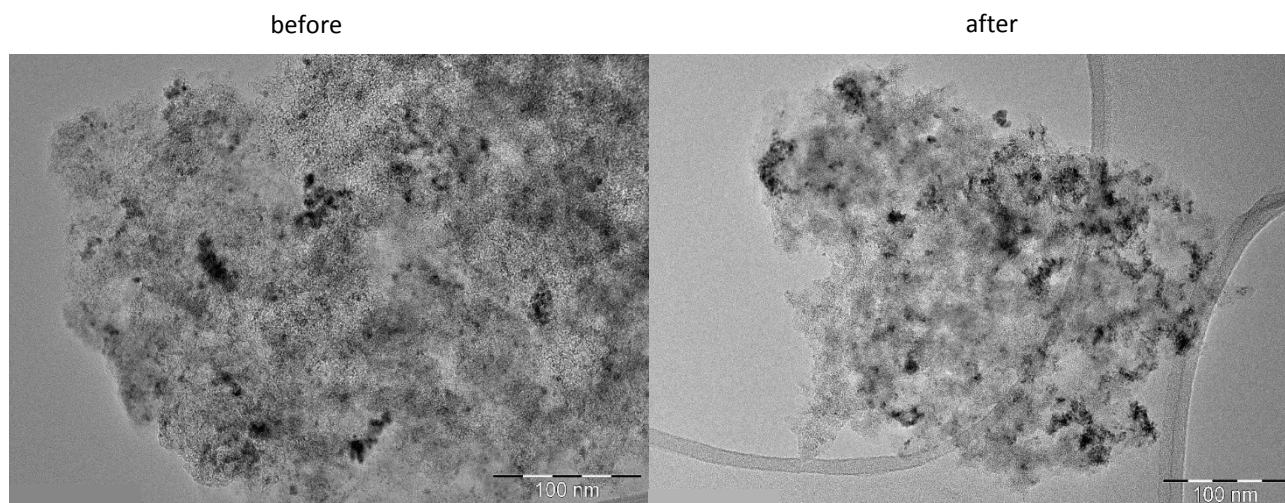


Fig. S4 TEM images of Ru/C before (left) and after (right) continuous flow hydrogenation at 80 °C. For reaction conditions see Fig. S1.

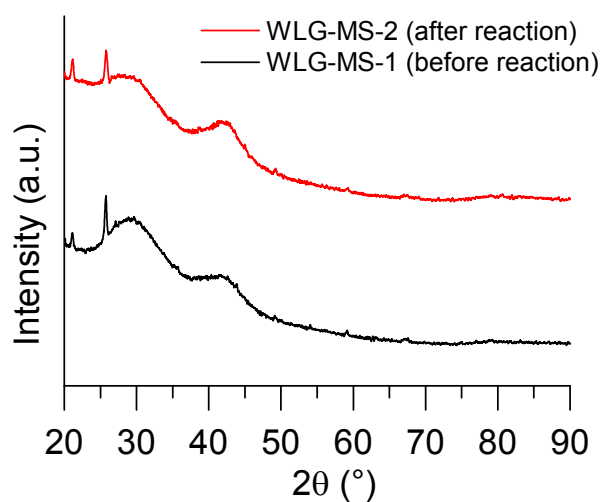


Fig. S5 X-ray diffractogram of Ru/C before (black) and after (red) continuous flow hydrogenation at 80 °C. For reaction conditions see Fig. S1.

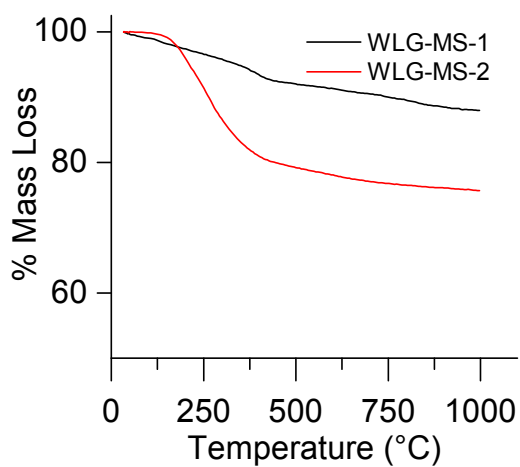
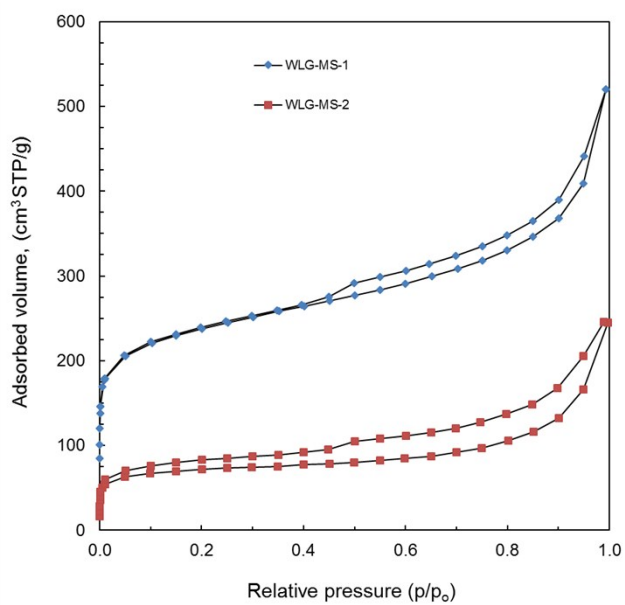


Fig. S6 TG analysis of Ru/C before (black) and after (red) continuous flow hydrogenation at 80 °C. For reaction conditions see Fig. S1.



Sample code	S_{BET} ($\text{m}^2 \text{g}^{-1}$)	V_p ($\text{cm}^3 \text{g}^{-1}$)
WLG-MS-1	860	0.81
WLG-MS-2	260	0.38

Fig. S7 BET analysis of Ru/C before (blue) and after (red) continuous flow hydrogenation at 80 °C. For reaction conditions see Fig. S1.

5. NMR Spectra

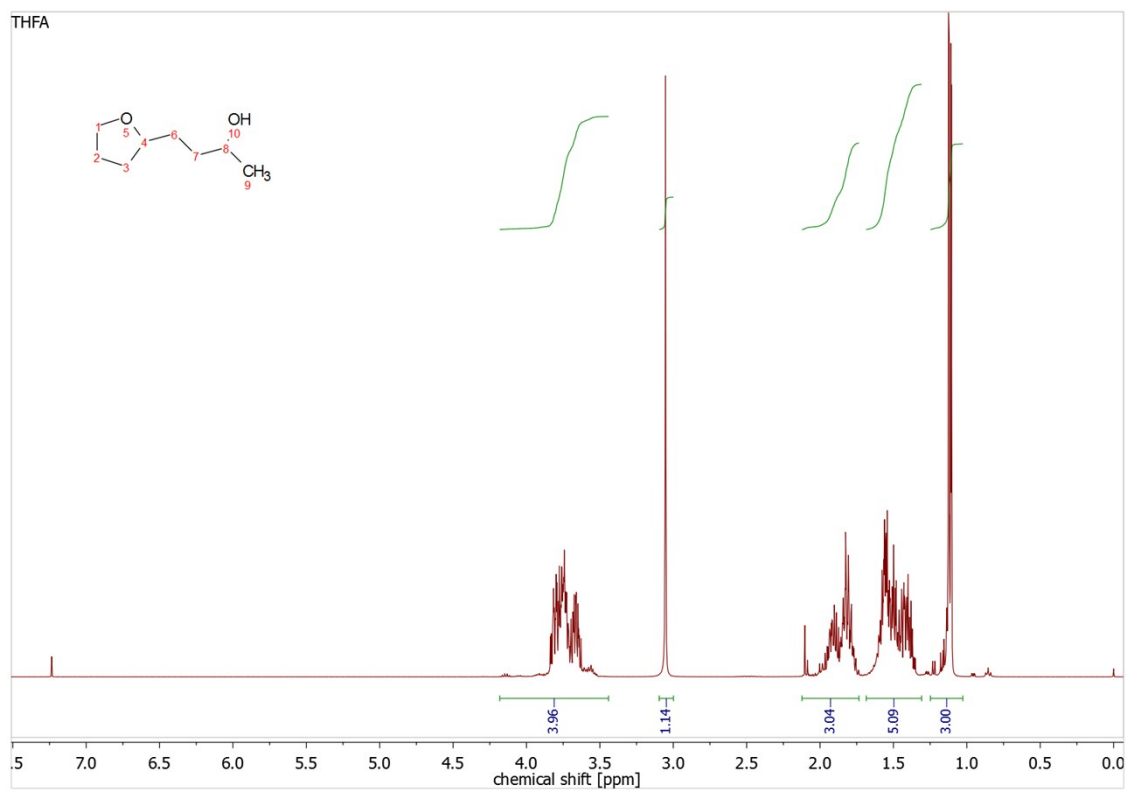


Fig. S8 ^1H -NMR spectrum of THFA.

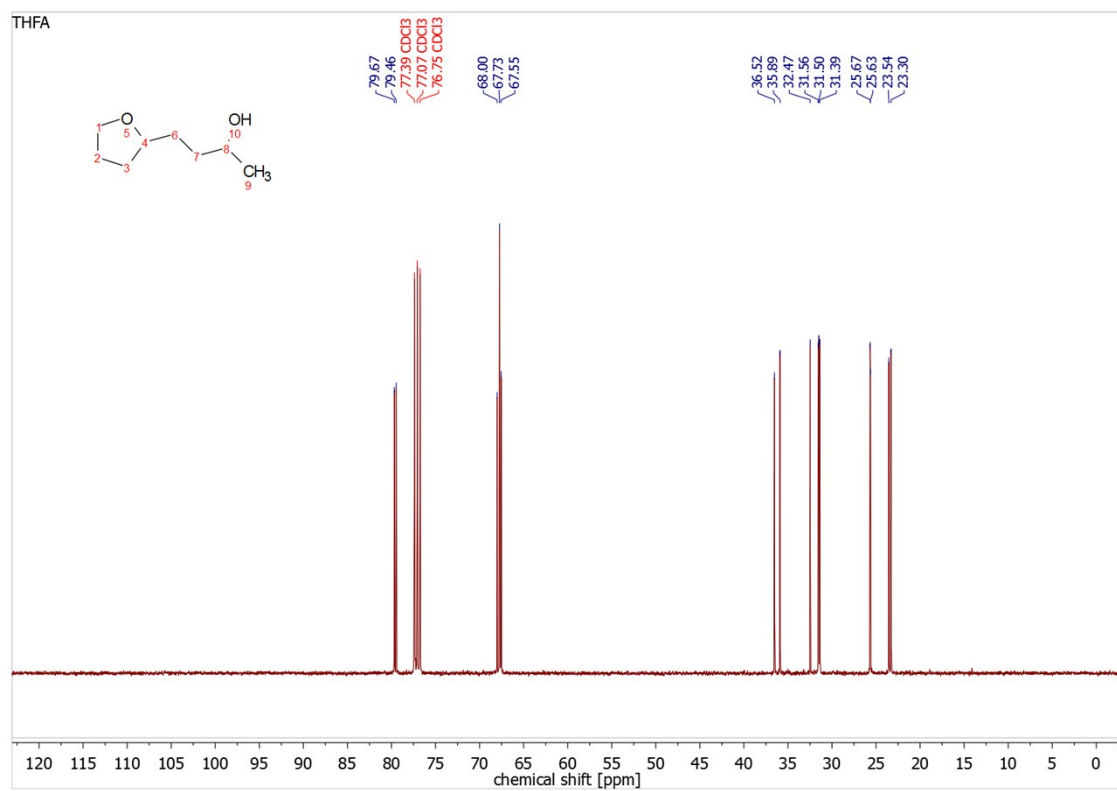


Fig. S9 ^{13}C -NMR spectrum of THFA.

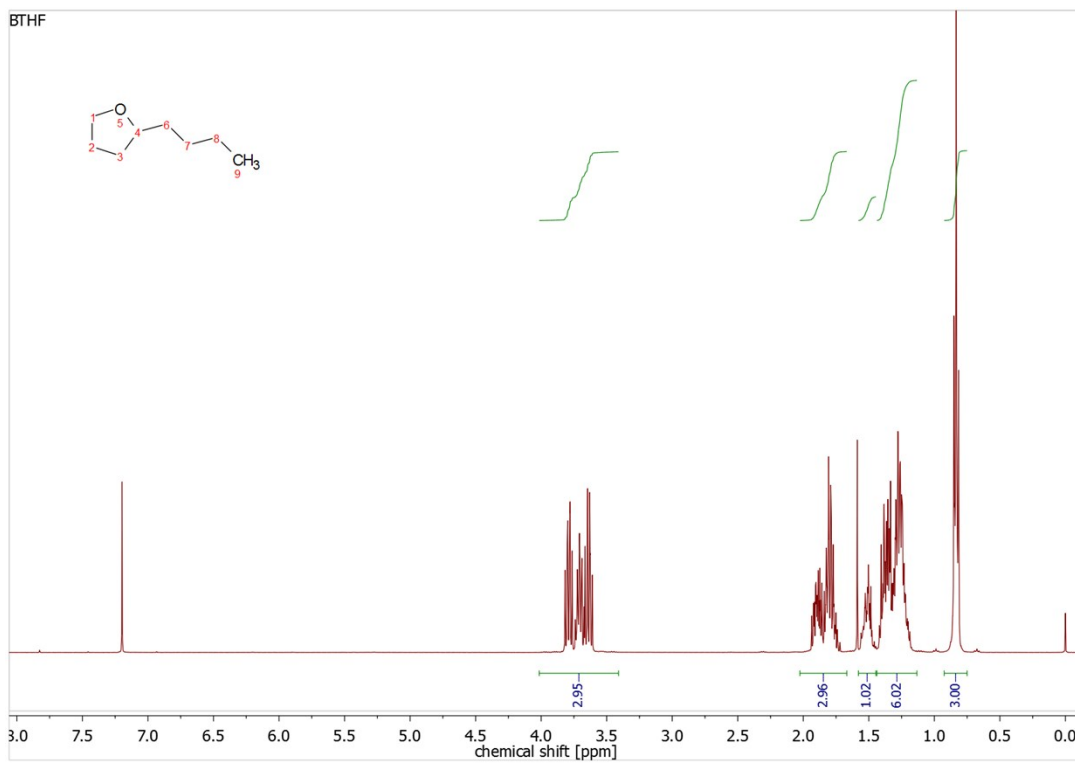


Fig. S10 ^1H -NMR spectrum of BTHF.

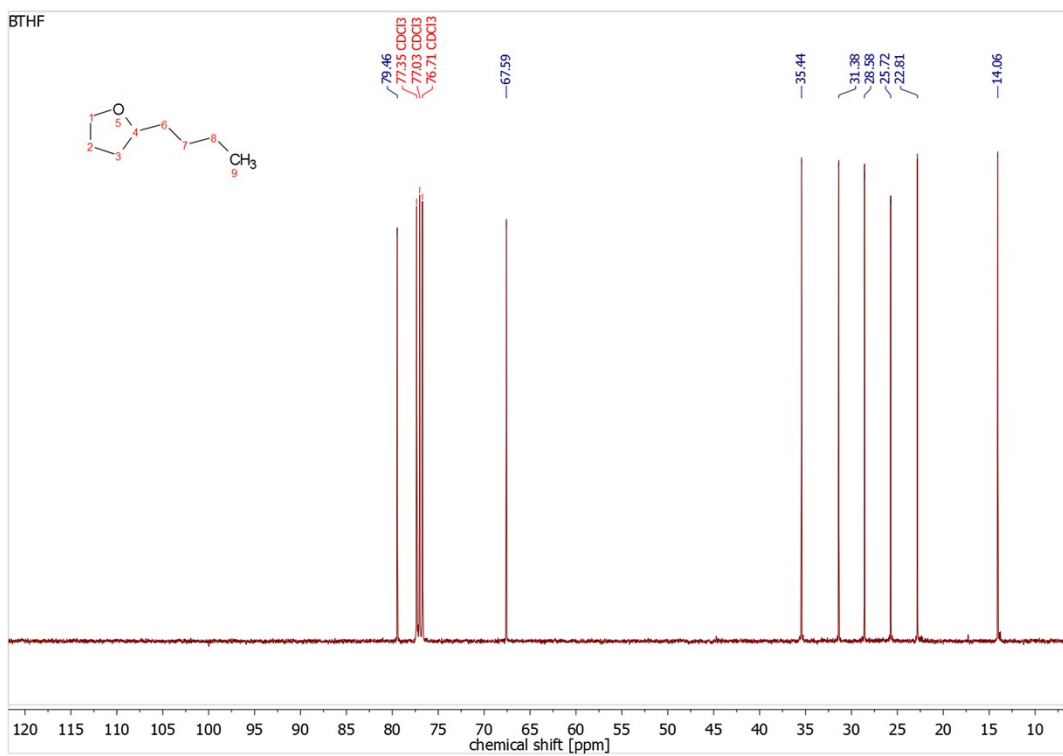


Fig. S11 ^{13}C -NMR spectrum of BTHF.