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Supporting Information

Effect of support acidity during selective hydrogenolysis of glycerol over supported palladium ruthenium catalysts

Susana Guadix-Montero,^a Alba Santos-Hernandez,^a Andrea Folli^b, Meenakshisundaram Sankar

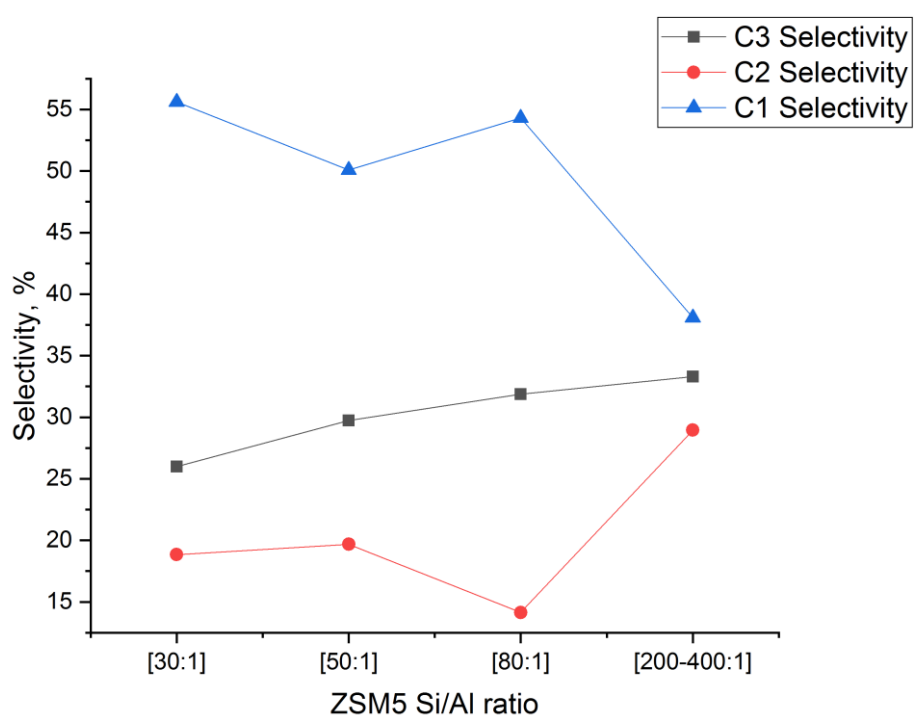


Figure S1 Correlation between the Si:Al ratio and products selectivity for different ZSM-5 supported catalysts.

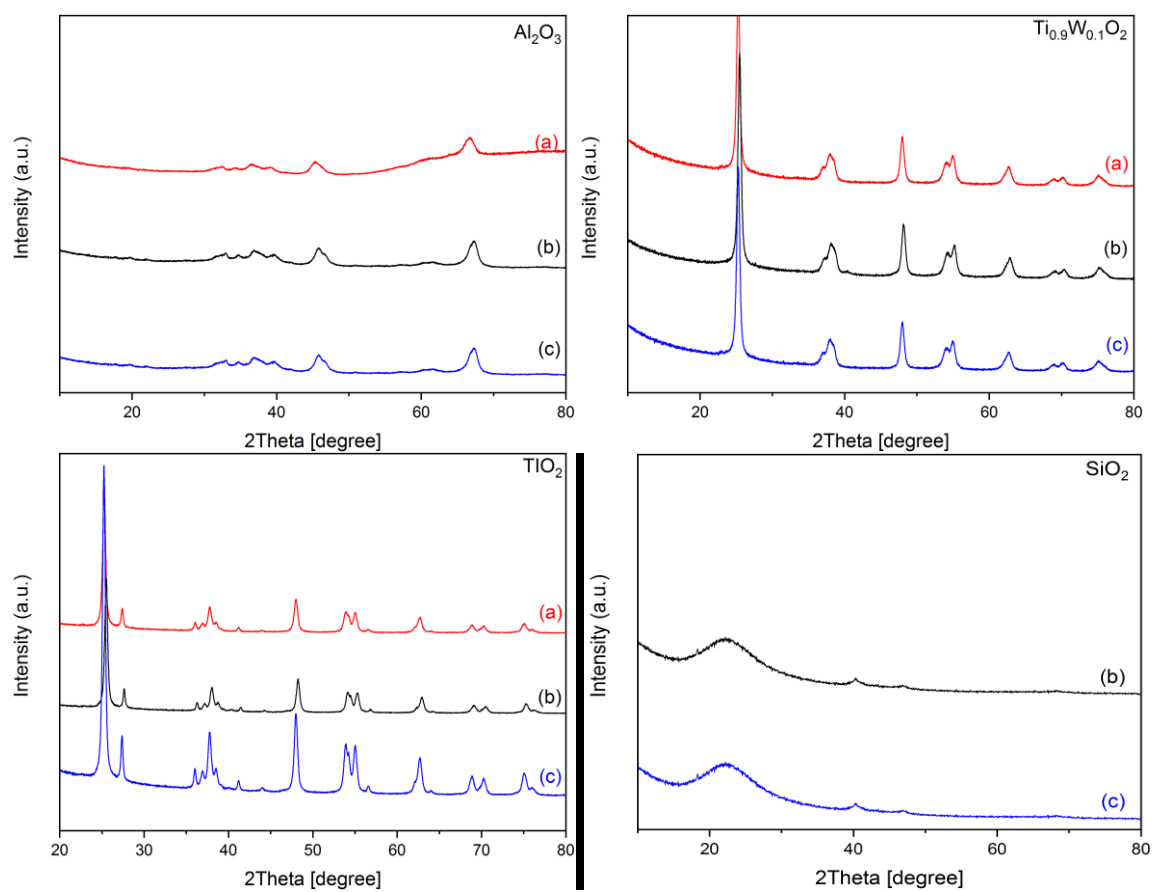


Figure S2 XRD patterns of a) support b) fresh and c) spent catalysts for different catalysts.

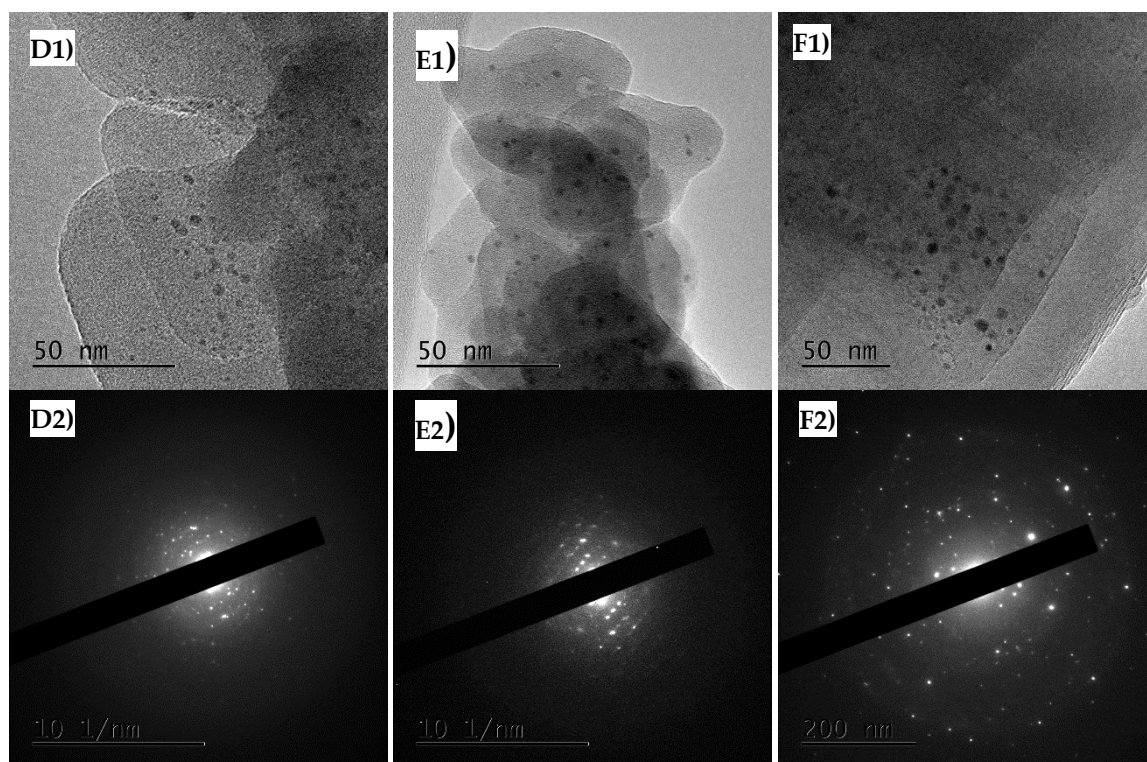
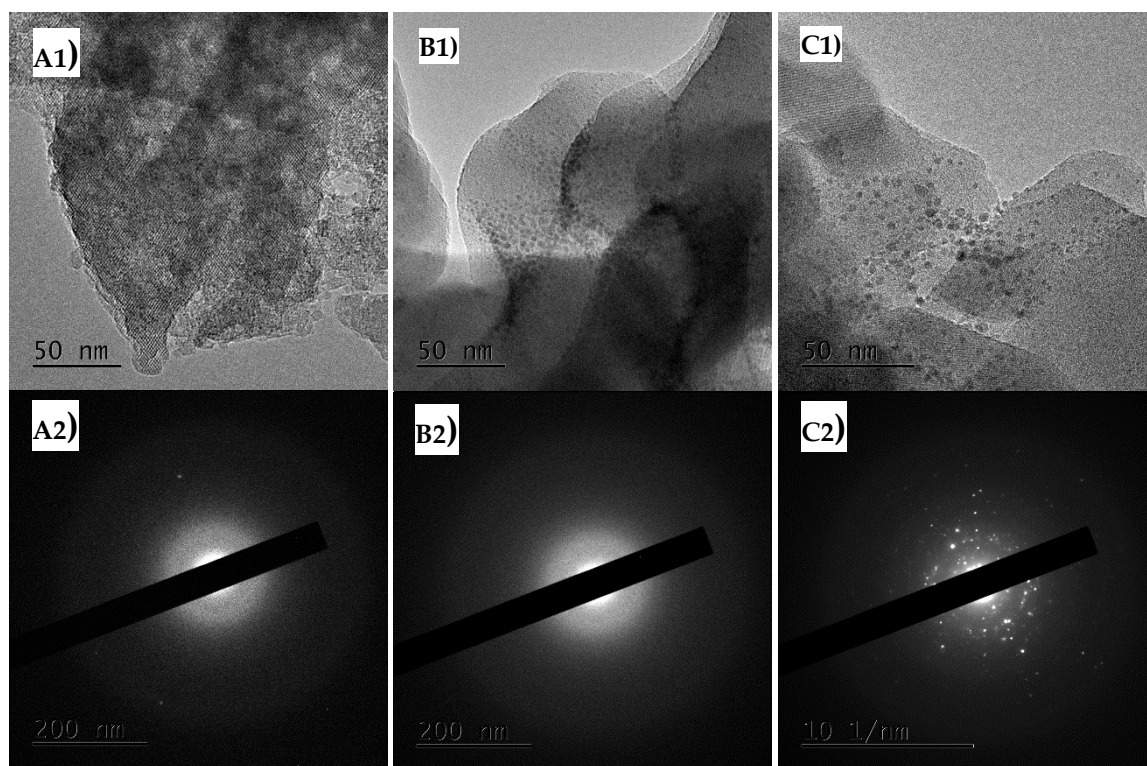


Figure S3. 1) TEM images of the supported PdRu catalysts (Scale bar 50 nm) and 2) SAED patterns of A) HY (5.1:1), B) MOR (20:1), C) ZSM5 (30:1), D) ZSM5 (50:1), E) ZSM5 (80:1), F) ZSM5 (200-400:1).

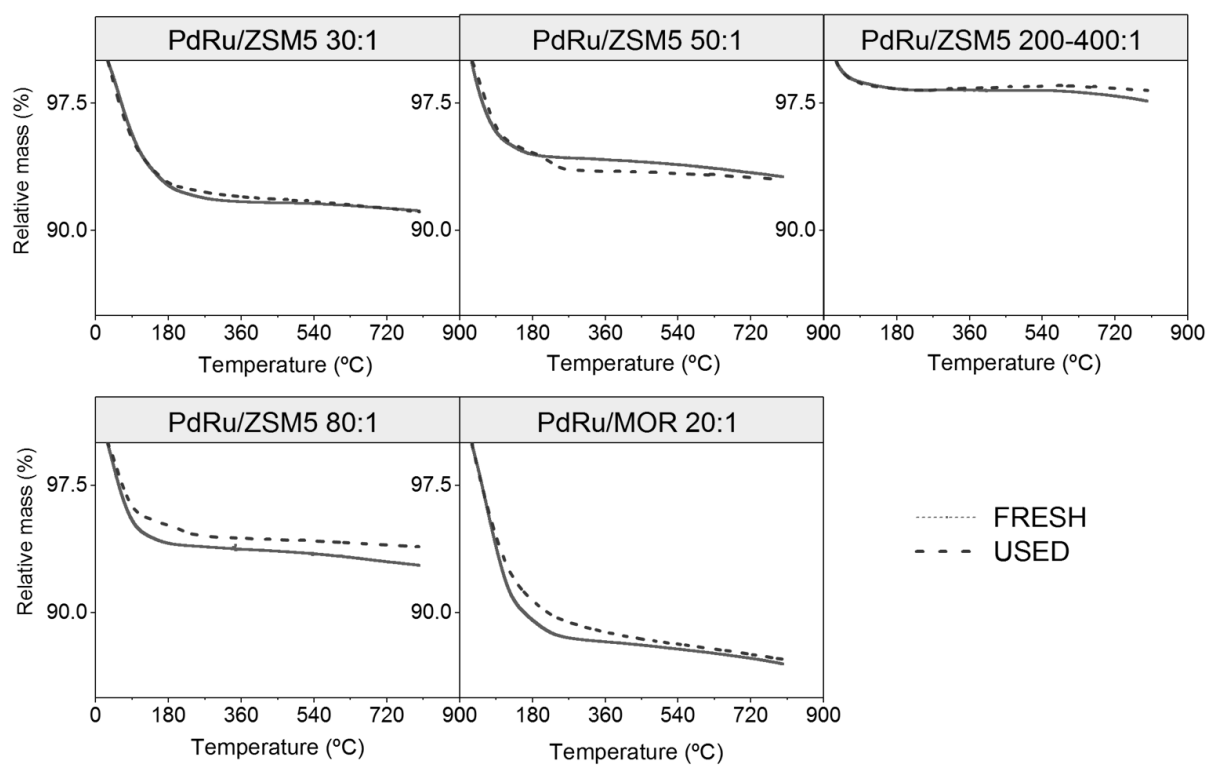


Figure S4 Thermogravimetric analysis of the fresh and used PdRu supported on zeolites.

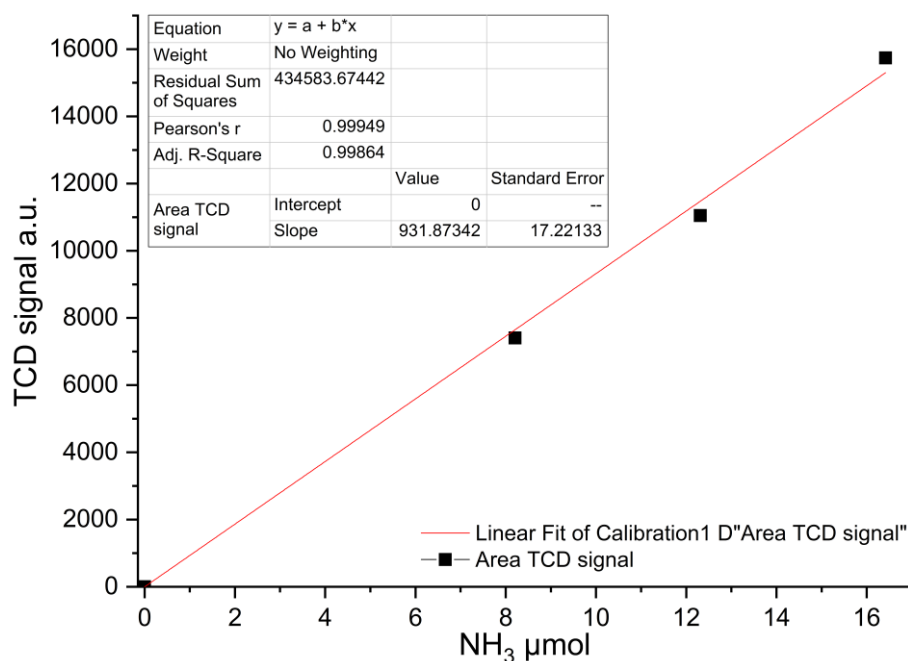


Figure S5. Linear fit correlation of ammonia calibration. Peak area *vs* known volume of ammonia injected was calculated with the area under the curve obtained by integration using Origin®9.1.

The following figures and tables show the results of the NH₃ TPD for all the catalysts tested. The curves represent the experimental data (thick black line), fitted result for the deconvolution (red dash line) and component curves obtained by deconvolution (Peaks 1-4). The goodness of fit of the statistical model was obtained using Origin® 9.0.

Peak Analysis

Data Set: RuPd/ZSM5[30:1]

BaseLine: Constant

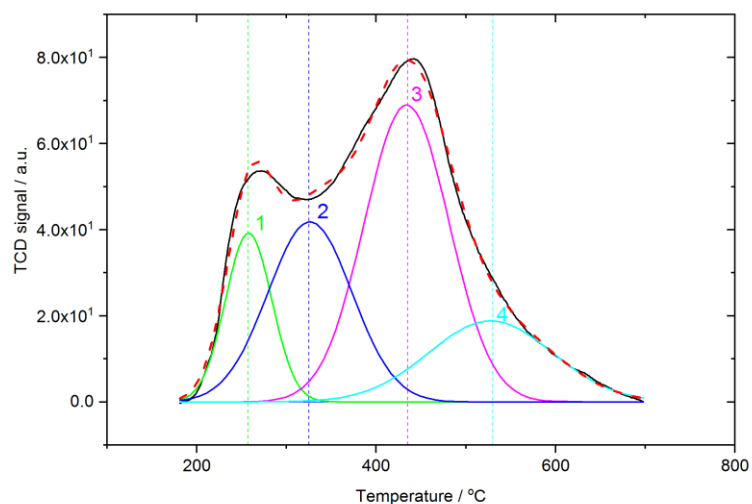
Chi²=1.57255E+000

Adj. R-Square=9.97570E-001

of Data Points=424.

SS=6.47892E+002

Degree of Freedom=412.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	2533,80173	60,84859	39,17881	257,75539	13,44026
2.	Gaussian	8142,82908	110,96551	68,93744	433,97694	43,1927
3.	Gaussian	4930,01635	110,92325	41,79708	326,14804	26,1507
4.	Gaussian	3245,68071	163,20696	18,81339	527,6147	17,21634

Peak Analysis

Data Set: RuPd/ZSM5-50:1

BaseLine: Constant

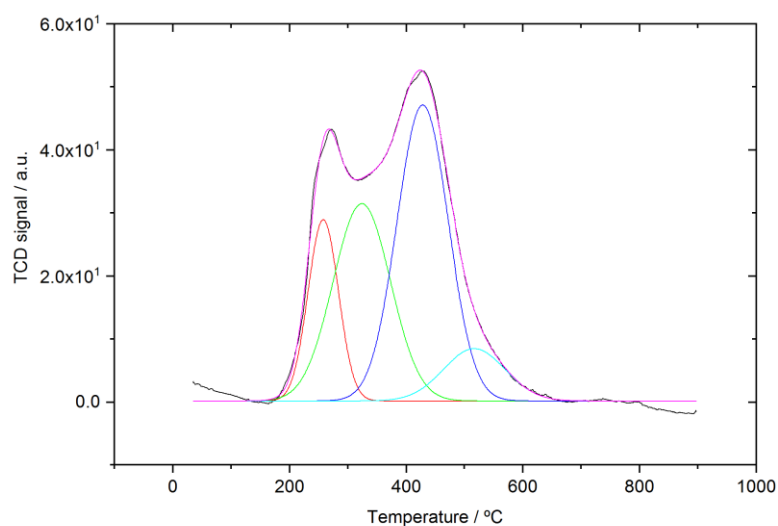
Chi²=9.1765E-001

Adj. R-Square=9.99718E-001

of Data Points=721

SS=6.496952E+002

Degree of Freedom=708



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	1874,66425	61,21426	28,76884	257,64368	11,92757208
2.	Gaussian	3859,01971	115,80917	31,30404	323,73165	32,55451016
3.	Gaussian	5186,44288	103,7617	46,95581	427,952	46,04536682
4.	Gaussian	1105,50843	125,08989	8,30233	516,58984	9,472550946

Peak Analysis

Data Set: RuPd/ZSM5-80:1

BaseLine: Constant

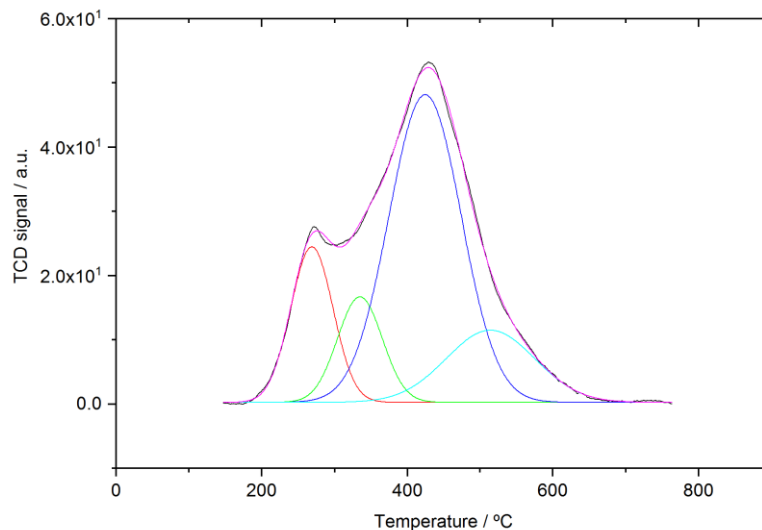
Chi²=1.5291E-001

Adj. R-Square=9.99948E-001

of Data Points=499

SS=7.431254E+001

Degree of Freedom=486



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	1765.38247	68.45308	24.48041	268.64651	16.44298223
2.	Gaussian	1268.61535	72.45548	16.70443	334.62245	11.81789703
3.	Gaussian	5975.23419	117.13366	48.1758	424.18024	55.65404171
4.	Gaussian	1726.95659	144.42869	11.48684	514.06167	16.08507902

Peak Analysis

Data Set: RuPd/ZSM5-[200-400:1]

BaseLine: Constant

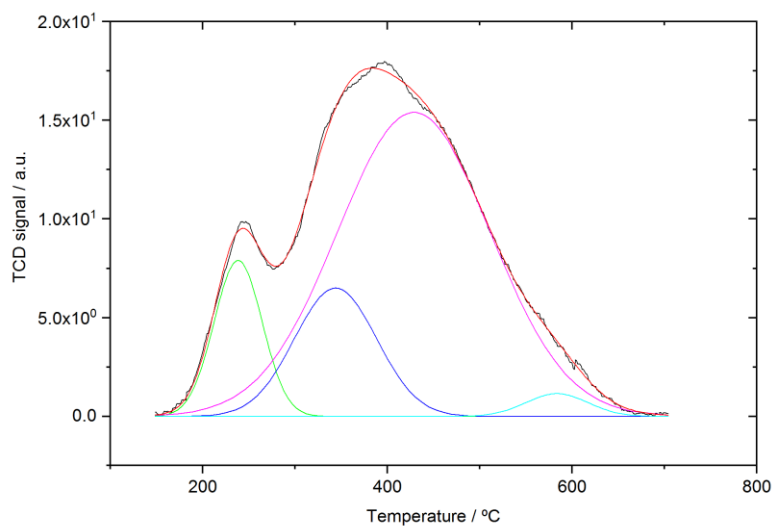
Chi²=3.41061E-002

Adj. R-Square=9.99044E-001

of Data Points=453.

SS=1.50408E+001

Degree of Freedom=441.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	515.28757	61.33346	7.89479	238.30531	11.36148
2.	Gaussian	724.29559	104.70268	6.49873	343.70578	15.96986
3.	Gaussian	3198.35123	195.27567	15.39909	428.57531	70.51985
4.	Gaussian	97.45679	79.49512	1.1519	583.79932	2.14881

Peak Analysis

Data Set: RuPd/Mordenite

BaseLine: Constant

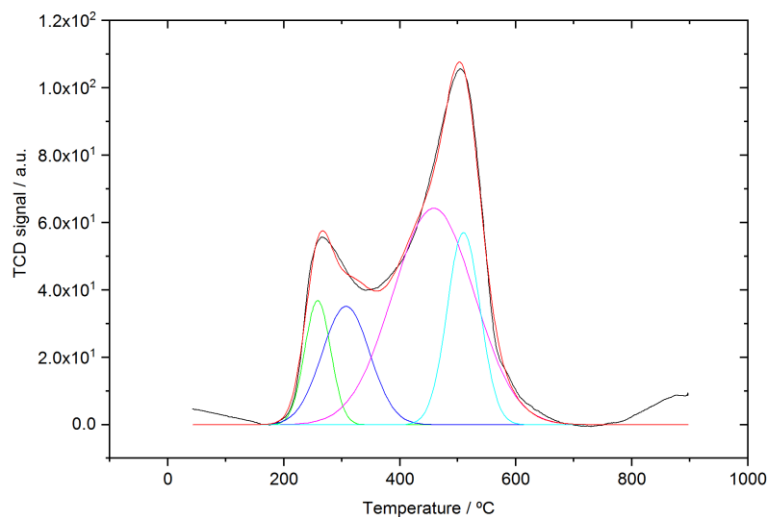
Chi²=1.00245E+001

Adj. R-Square=9.89218E-001

of Data Points=715.

SS=7.04722E+003

Degree of Freedom=703.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	2062,79565	52,63938	36,81402	258,32253	9,76319
2.	Gaussian	3616,60681	96,75964	35,11356	307,02591	17,11737
3.	Gaussian	11349,12833	165,98817	64,23225	458,07594	53,71533
4.	Gaussian	4099,75559	67,5757	56,99479	510,12292	19,40411

Peak Analysis

Data Set: RuPd/HY Zeolite

BaseLine: Constant

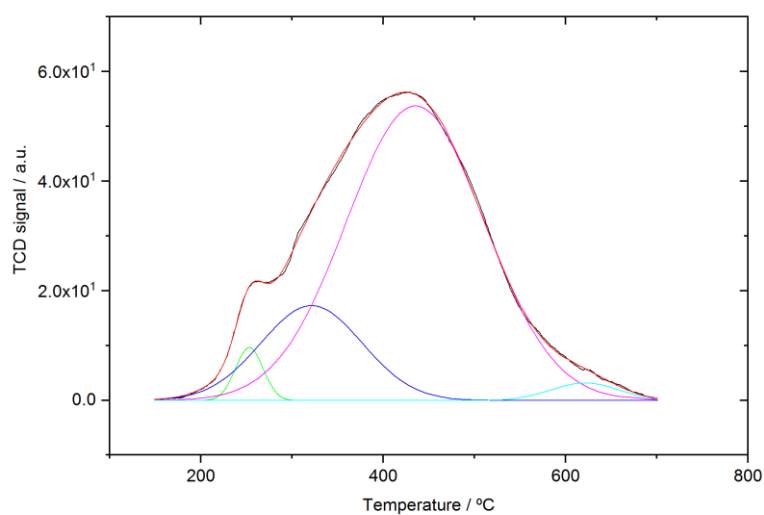
Chi²=1.56649E-001

Adj. R-Square=9.99586E-001

of Data Points=459.

SS=7.00222E+001

Degree of Freedom=447.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	365,34388	35,61069	9,63805	253,10758	2,75504
2.	Gaussian	2404,72204	130,90534	17,27445	321,23981	18,13388
3.	Gaussian	10200,52493	178,42888	53,72295	435,23404	76,92163
4.	Gaussian	290,34166	87,23638	3,17807	621,3806	2,18945

Peak Analysis

Data Set: RuPd/TiO₂, 9W0, 1O2

Date: 03/02/2019

BaseLine: Constant

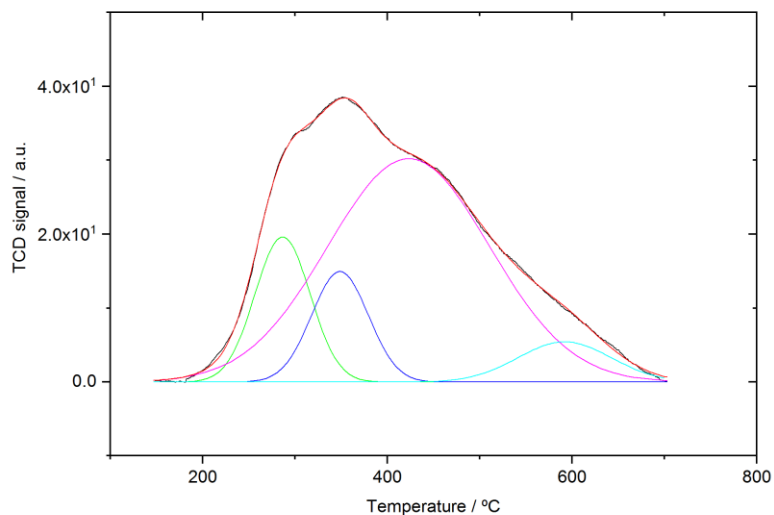
Chi²=6.25439E-002

Adj. R-Square=9.99634E-001

of Data Points=449.

SS=2.73317E+001

Degree of Freedom=437.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	1470,01689	70,43522	19,60654	286,42499	14,77326
2.	Gaussian	1149,25203	72,24987	14,94328	348,47385	11,54966
3.	Gaussian	6652,393	207,30059	30,19504	423,02241	66,85467
4.	Gaussian	678,86613	118,88828	5,44055	592,05126	6,82241

Peak Analysis

Data Set: RuPd/TiO₂

BaseLine: Constant

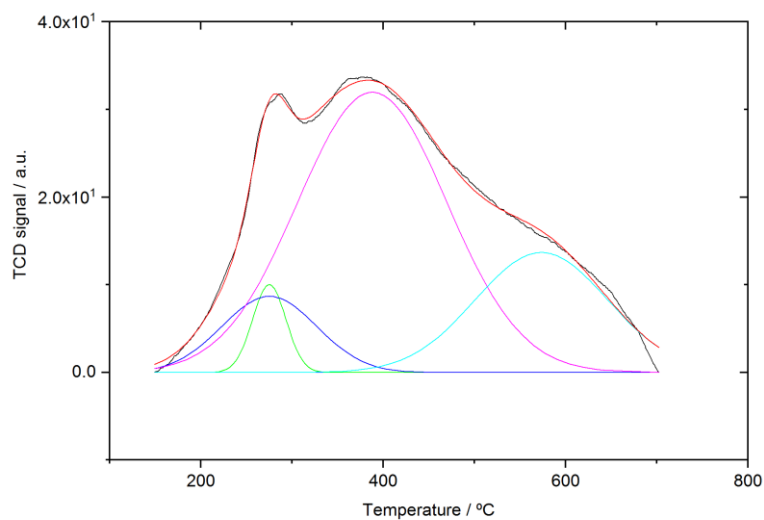
Chi²=3.27120E-001

Adj. R-Square=9.97038E-001

of Data Points=450.

SS=1.43279E+002

Degree of Freedom=438.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	458,90766	43,09157	10,00462	274,9975	4,35467
2.	Gaussian	1123,56759	122,48564	8,6846	274,99819	10,66176
3.	Gaussian	6559,84015	193,26986	31,94535	387,93548	62,24764
4.	Gaussian	2395,98074	171,01888	13,67796	573,60072	22,73594

Peak Analysis

Data Set: RuPd/SiO₂

BaseLine: Constant

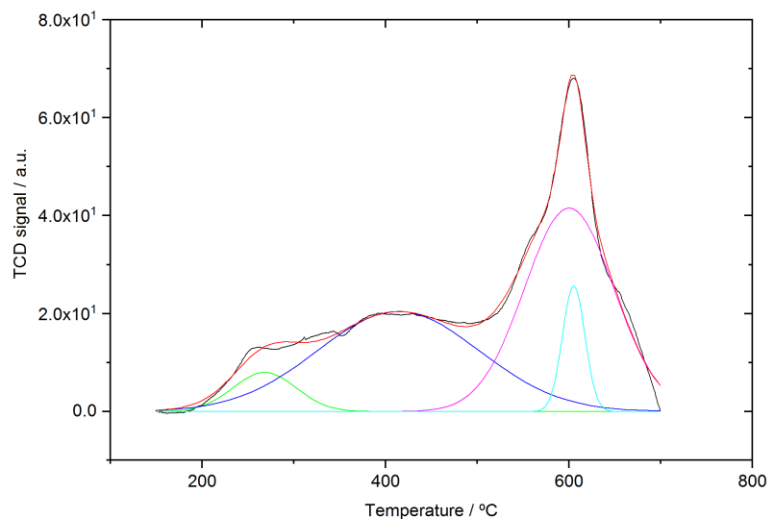
Chi²=1.06576E+000

Adj. R-Square=9.95368E-001

of Data Points=446.

SS=4.62540E+002

Degree of Freedom=434.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	690,91246	81,45899	7,97046	267,97598	6,2933
2.	Gaussian	4528,17127	208,95035	20,40094	413,87426	41,24569
3.	Gaussian	4972,05087	114,89028	41,52307	600,24935	45,28885
4.	Gaussian	787,39682	28,89042	25,60399	605,2655	7,17215

Peak Analysis

Data Set: RuPd/Al₂O₃

BaseLine: Constant

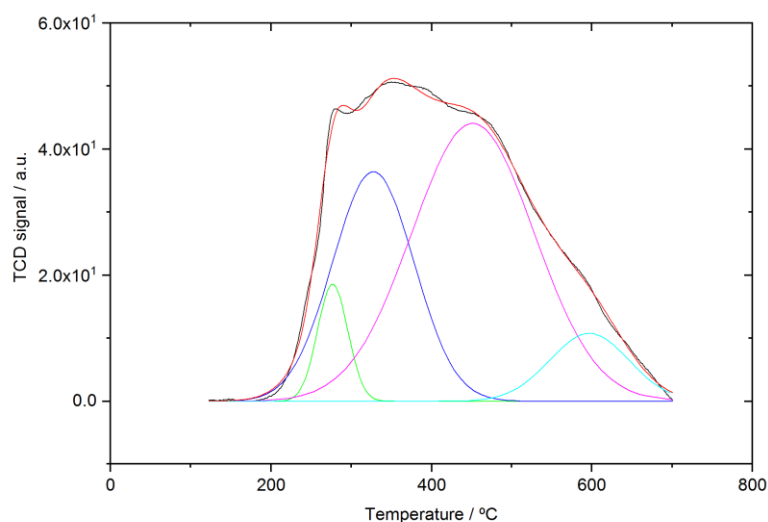
Chi²=4.83192E-001

Adj. R-Square=9.98671E-001

of Data Points=471.

SS=2.21785E+002

Degree of Freedom=459.



Fitting Results

Peak Index	Peak Type	Area Intg	FWHM	Max Height	Center Grvty	Area IntgP
1.	Gaussian	878,15034	44,50546	18,53631	276,77845	5,75384
2.	Gaussian	4620,768	119,26882	36,39706	327,3673	30,27633
3.	Gaussian	8456,24927	180,37098	44,06888	451,71834	55,40728
4.	Gaussian	1306,81525	116,15882	10,758	596,85643	8,56255