Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supporting Information

Tailoring the selectivity to glyceraldehyde by tuning the acid-based properties of Au catalysts

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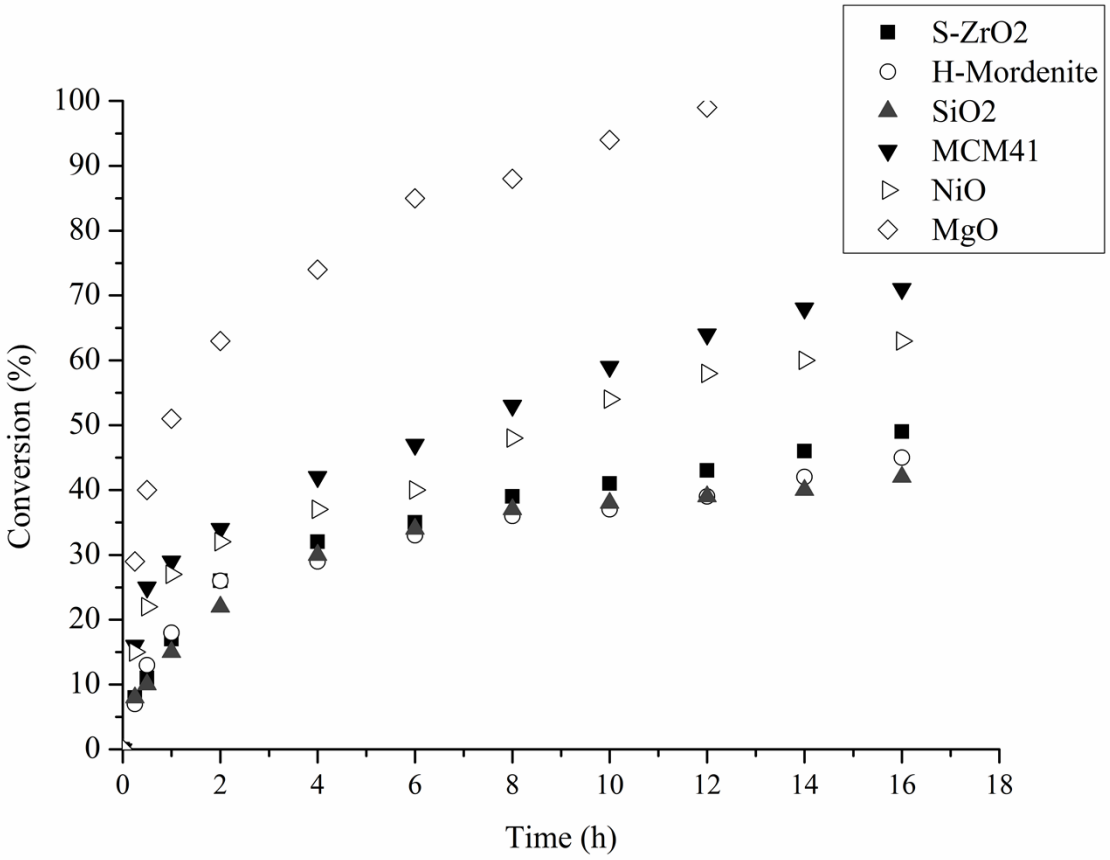
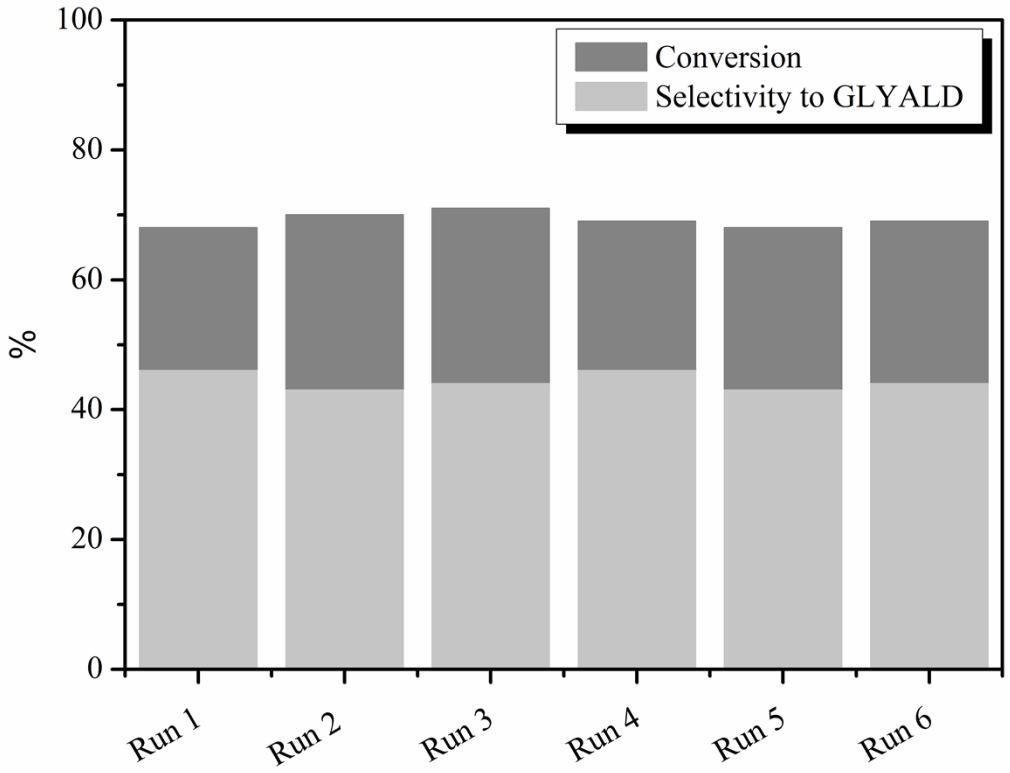
S1 Reaction profile for AuPt based catalysts

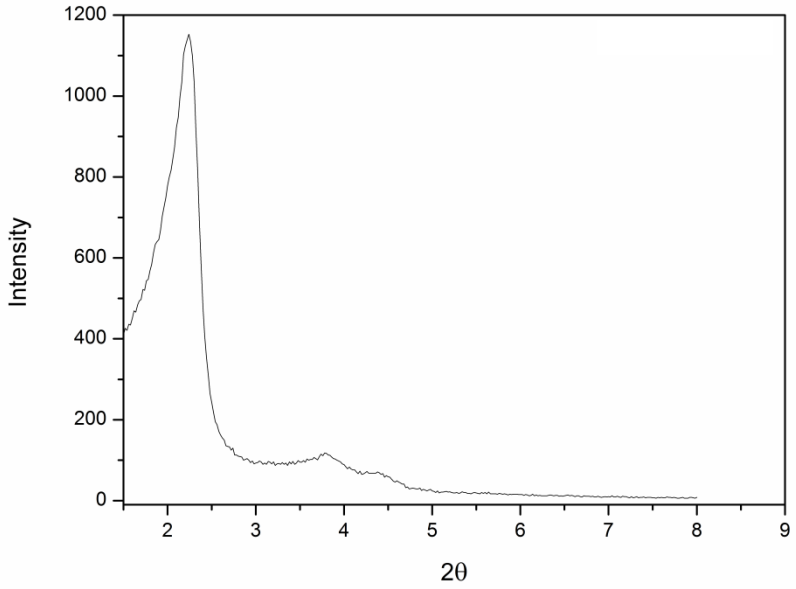


S2 Recycling tests using AuPt/MCM41

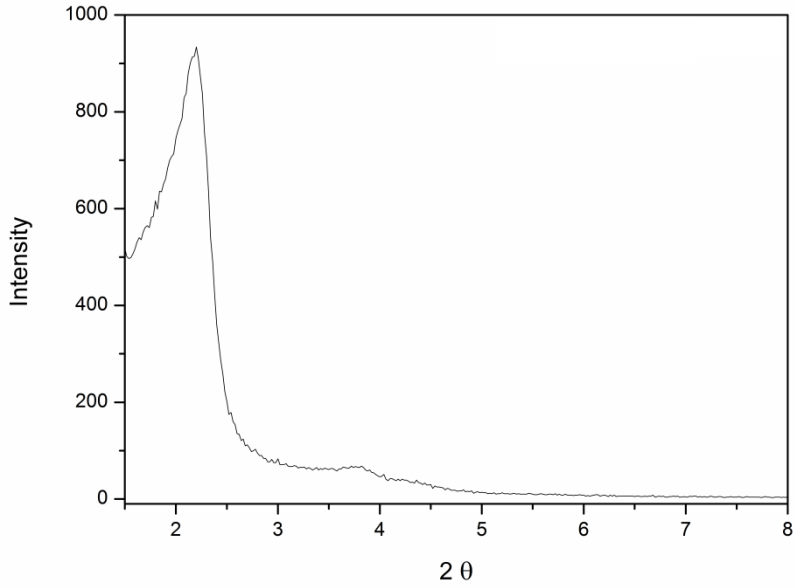
Glycerol 0.3M in water; metal/alcohol = 1/500 mol/mol; 300kPa O_2; T=80°C.



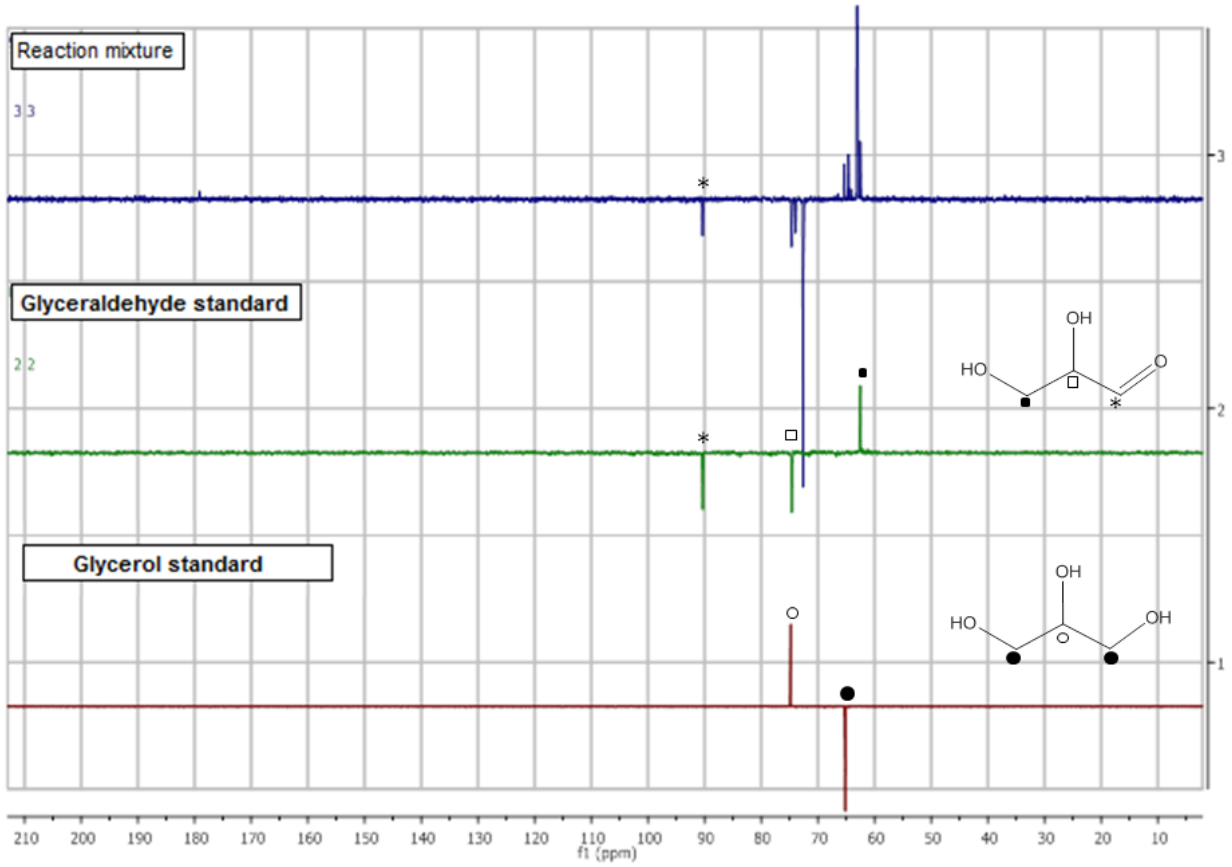
S3 Small angle XRD of AuPt/MCM-41 a) before and b) after reaction



a)



b)

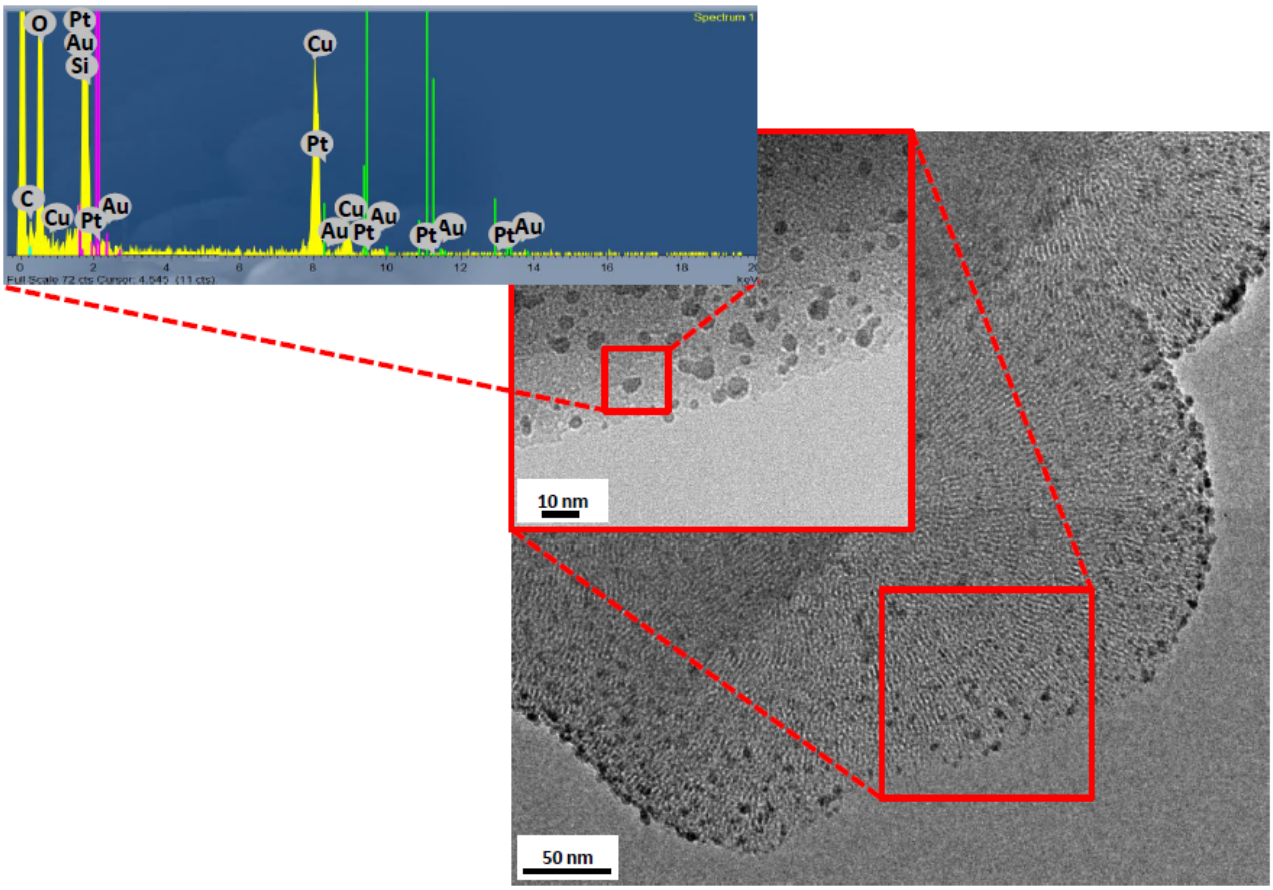

Reaction mixture
Glyceraldehyde standard
Glycerol standard
OH
HO
O
OH
HO
OH
O
f1 (ppm)

S5: Effect of the reaction temperature using 1% Au_6Pt_4/MCM41

Reaction temperature	Activity	Selectivity (%)[b]				
	mol (AuPt mol)$^{-1}$ h^{-1} [a]	GLYA	GLYALD	TA	C2/C1	DHA
40°C	112	31	55	-	-	14
60°C	173	37	50	1	-	12
80°C	228	35	46	1	-	18

Reaction conditions: 0.3M glycerol, glycerol/metal=500mol/mol, 3atm O_2, a) Mol of glycerol converted per hour per mol of metal, calculated after 15 min reaction b) Selectivity calculated at 30% conversion GLYA=glyceric acid; GLYALD=glyceraldehyde; TA=tartronic acid; DHA=dihydroxyacetone

S6 TEM and EDS analysis performed on the AuPt/MCM-41 catalyst. Instrumental magnification: 50000X; Inset: 200000X.



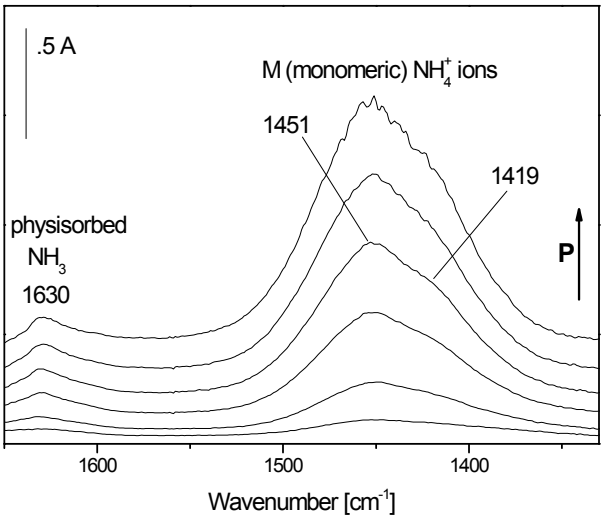
Element	Weight %
C	2.31 ±0.16
O	37.30±0.35
Si	39.41±0.32
Au	0.73 ± 0.17
Pt	0.27 ± 0.11
Cu	19.98±0.25

(The signals of carbon and copper are due to the grid).

S7 Statistical median and standard deviation of particle size analysis for AuPt based catalysts

Catalyst	*Statistical median (nm)*	*Deviation standard (σ)*
AuPt/S-ZrO2	6.9	3.3
AuPt/H-Mordenite	6.2	3.2
AuPt/SiO_2	7.5	3.4
AuPt/MCM41	6.7	3.2

S8 FTIR spectra of NH_3 adsorbed at 373 K on AuPt/H-Mordenite .



S9 Q_{int} as function of the μmol of adsorbed NH_3: (-■-) AuPt/MCM41; (-□-) AuPt/SiO_2; (-ஜ-) AuPt/H-Mord; (-◴-) AuPt/S-ZrO_2;