

**Promoting effect of hierarchical zeolite on Ag catalysts for the gas-phase
selective hydrogenation of α -methylacrolein**

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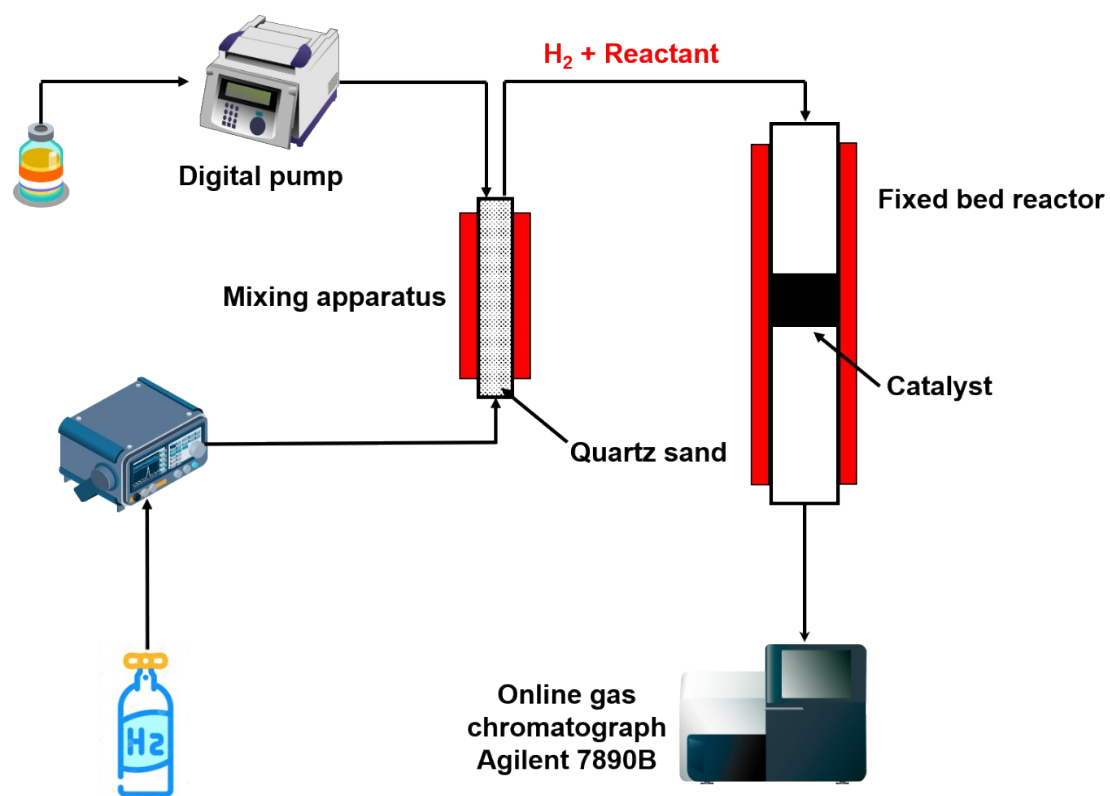
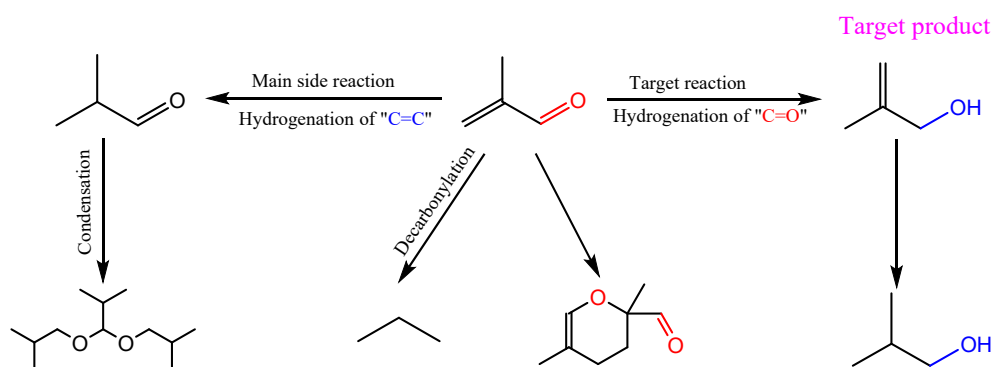


Fig.S1 Diagram of catalytic evaluation device.



Scheme.S1 Competition routes for the selective hydrogenation of α -methylacrolein.

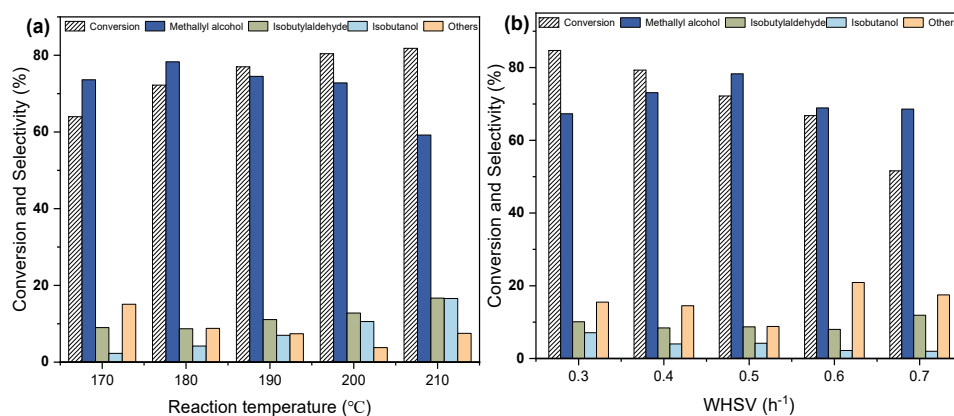


Fig.S2 Impacts of reaction condition on the selective hydrogenation of α -methylacrolein.

Table.S1 Textual properties of original and alkaline-treated zeolites and theirs supported Ag catalysts.

Sample	Ag particle Size ^a (nm)	S_{total}^b (m ² /g)	S_{mic}^c (m ² /g)	S_{est}^d (m ² /g)	V_{total}^e (cm ³ /g)	V_{mic}^f (cm ³ /g)	V_{mes}^g (cm ³ /g)
Pristine ZSM-5		454	431	23	0.23	0.19	0.04
5Ag/Z-5	25.1	405	387	18	0.20	0.17	0.03
10Ag/Z-5	21.8	347	334	13	0.19	0.14	0.03
15Ag/Z-5	24.1	333	313	20	0.18	0.13	0.05
AT-Z-5		433	344	89	0.43	0.14	0.29
5Ag/AT-Z-5	21.4	396	297	99	0.40	0.12	0.28
10Ag/AT-Z-5	18.9	352	256	96	0.36	0.11	0.25
15Ag/AT-Z-5	20.0	334	260	74	0.34	0.11	0.23
Pristine Silicalite-1		319	293	26	0.20	0.14	0.06
5Ag/S-1	19.4	313	301	12	0.19	0.14	0.05
10Ag/S-1	20.5	286	264	22	0.19	0.13	0.06
15Ag/S-1	24.7	300	283	17	0.18	0.12	0.06
AT-S-1		338	218	120	0.46	0.10	0.36
5Ag/ AT-S-1	14.2	266	192	74	0.37	0.09	0.28
10Ag/ AT-S-1	18.4	250	184	66	0.34	0.08	0.26
15Ag/ AT-S-1	18.7	249	178	71	0.31	0.08	0.23
5 Ag/S-1-Al	17.8	275	205	70	0.35	0.09	0.26

^a Calculated by Scherrer formula on the base of XRD results; ^b total surface area determined by BET method; ^c Microporous surface area determined by t-plot method; ^d external and mesoporous surface area = $S_{total} - S_{mic}$; ^e Total pore volume from the volume at P/P₀ of 0.99; ^f micropore volume determined by t-plot method; ^g mesopore volume = $V_{total} - V_{mic}$.