

$\text{S}_2\text{O}_8^{2-}/\text{CeO}_2$ Solid Superacid Catalyst Prepared by Radio-Frequency Plasma-Assisted Hydrothermal Method

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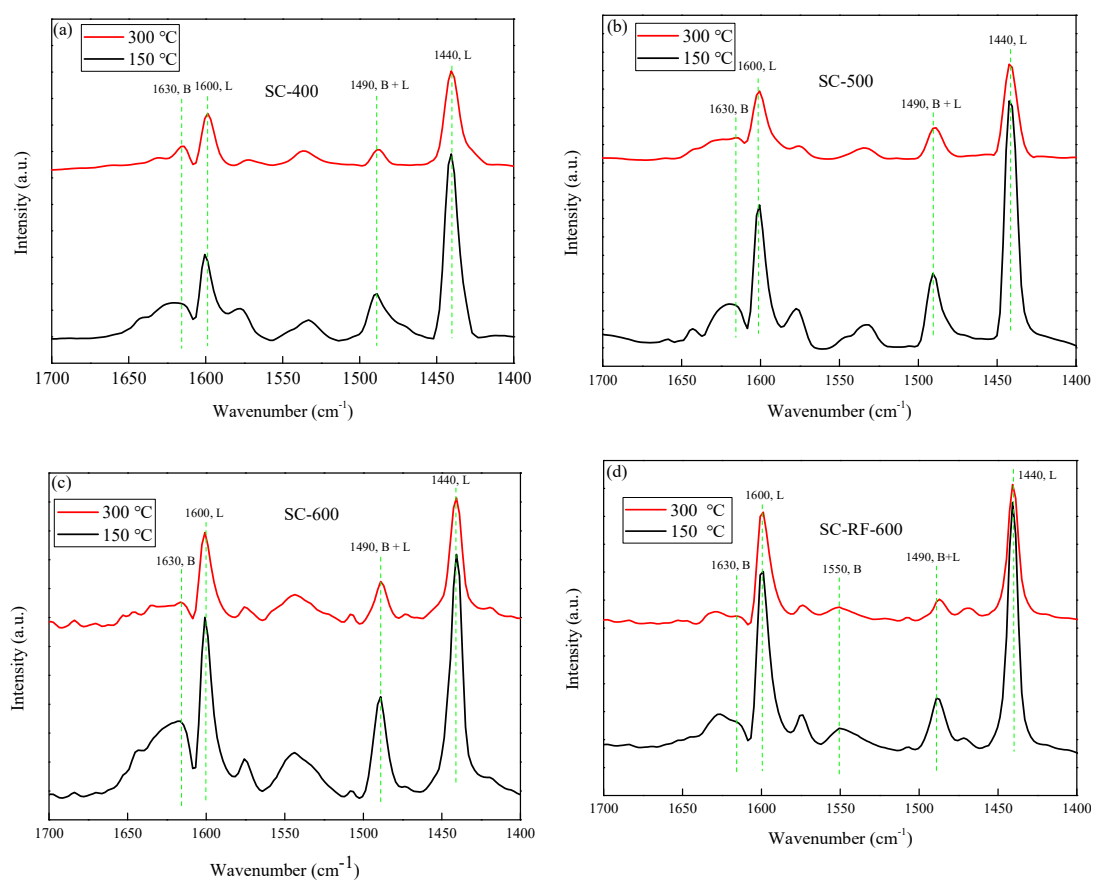


Figure S1. Py-IR spectra of the catalysts: (a) SC-400, (b) SC-500, (c) SC-600 and (d) SC-RF-600.

Table S1. The summary of acid density over the catalysts.

Entry	Catalyst	T (°C)	BA density ($\mu\text{mol} \cdot \text{g}^{-1}$)	LA density ($\mu\text{mol} \cdot \text{g}^{-1}$)	Total acid density ($\mu\text{mol} \cdot \text{g}^{-1}$)	BA density/LA density
1	SC-400	150	7.33	36.56	43.89	0.20
		300	3.64	14.32	17.96	0.15
2	SC-500	150	9.81	38.84	48.65	0.25
		300	4.38	15.21	19.58	0.29
3	SC-600	150	14.52	30.80	45.32	0.47
		300	9.53	12.80	22.33	0.74
4	SC-RF- 600	150	13.83	65.66	79.49	0.21

	300	5.44	35.97	41.41	0.15
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Table S2. Comparison of physical properties between the obtained TrpOMe and commercial TrpOMe.

TrpOMe	Viscosity(mPa·s)	Density (g·cm ⁻³)	Water content (wt%)
	a	b	c
Obtained	0.367	0.767	0.169
Commercial	0.442	0.751	0.207

a: determined using an Anton Paar MCR92 rheometer

b: determined using a Micrometrics AccuPyc II 1340 Pycnometer

c: determined by a Mettler Toledo DL31 Karl Fischer titrator

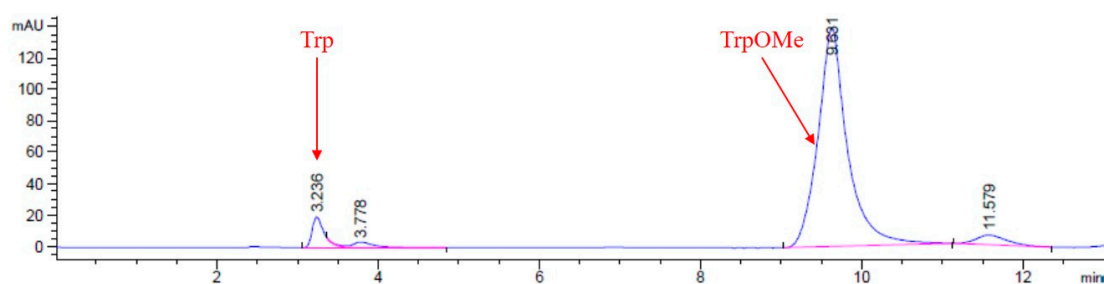


Figure S2. HPLC chromatography of the reaction.

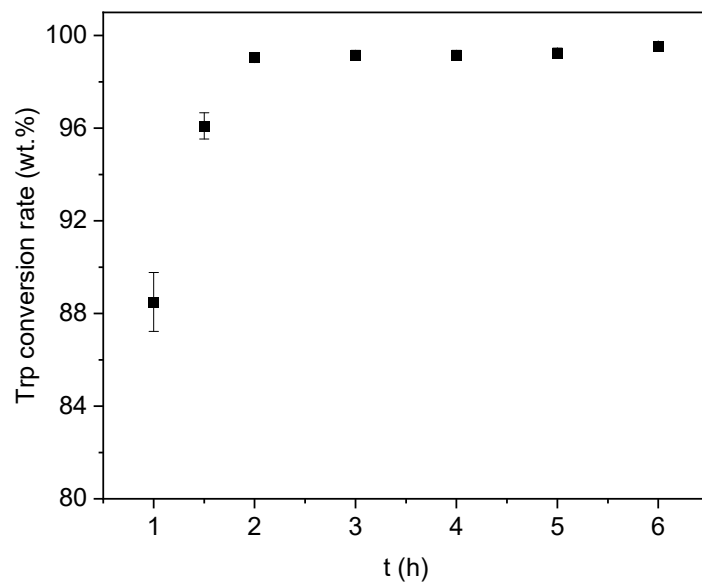


Figure S3. Trp conversion rate during the Trp esterification.

Reaction conditions: 50 mg catalyst, 0.0025 mol Trp, 0.5 mol methanol, 150 °C, 1 MPa N₂, 500 rpm.

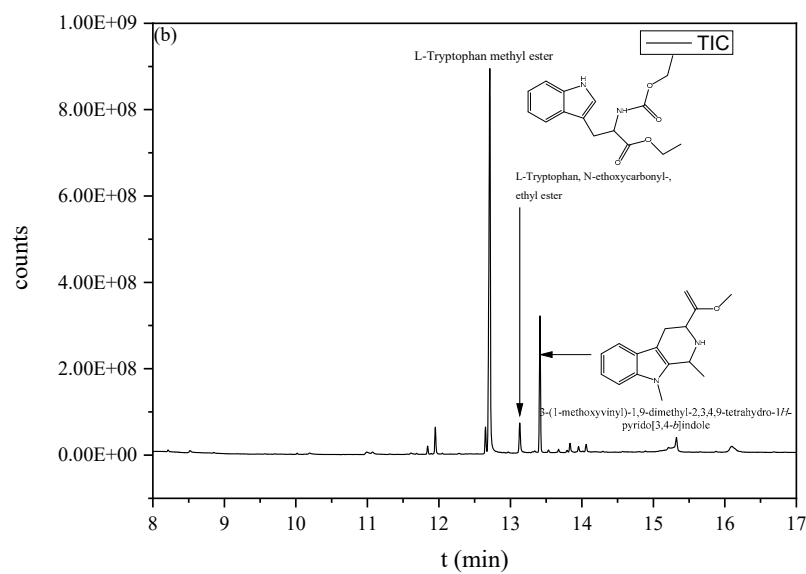


Figure S4. GC-MS of the by-products from the esterification reaction of L-Trp, with corresponding by-products structures listed.