

2-Methoxy-1-phenyl-3-buten-1-ol (3) was prepared by the general method of Koreeda and Tanaka.^{S1} To a solution of benzaldehyde (0.11 mL, 1.0 mmol) and freshly distilled BF₃ etherate (0.28 mL, 2.0 mmol) in 3 mL of dry CH₂Cl₂ was added γ -methoxyallyltributyltin (prepared by the method of Yamamoto, *et al.*^{S2}) (0.4 mL, 1.0 mmol) at -78 °C under nitrogen. After 4 h, the reaction was quenched by addition of water/methanol. The phases were separated, and the aqueous phase was extracted with CH₂Cl₂ (3 portions). The combined organic phases were washed with satd aqueous NaCl solution and dried over MgSO₄. Concentration at reduced pressure gave a residue that was purified by chromatography (silica gel; hexanes/ethyl acetate, 10:1) to give 130 mg (73%) of a 17:1 mixture of *erythro*- and *threo*-**3c**. ¹H NMR (major isomer): δ 3.30 (d, *J* = 2.1 Hz, 1H), 3.38 (s, 3H), 3.63 (t, *J* = 6.9 Hz, 1H), 4.50 (dd, *J* = 7.8, 1.8 Hz, 1H), 5.5-5.6 (m, 2H), 5.0-5.2 (m, 1H), 7.25-7.35 (m, 5H). ¹³C NMR (major isomer): δ 56.7, 77.4, 87.5, 119.6, 127.3, 127.9, 128.1, 134.0, 139.7. HRMS: calcd for C₁₁H₁₂O, 160.0888; found, 160.0889.

2-(*p*-Hydroxyphenyl)-3-methoxy-1-methylcyclopropane (5). A solution of *n*-BuLi (8.2 mL, 1.6 M in hexane, 13 mmol) was added to a solution of (Me₃Si)₂NH (2.1 g, 13 mmol) in 40 mL of THF at 0 °C. Methoxymethyltriphenylphosphonium chloride (4.5 g, 31 mmol) was added slowly via a solids addition funnel. The dark red solution was stirred at 0 °C for 45 min. A solution of *p*-anisaldehyde (1.4 g, 10 mmol) in 40 mL of THF was added via syringe. The mixture was stirred at 0 °C for 2 h. The reaction mixture was poured into 300 mL of pentane, and the resulting mixture was filtered through silica gel. Solvent removal gave 1.5 g (9.1 mmol, 90%) of β -methoxy-*p*-methoxystyrene (oil) as a 1:1 mixture of isomers that was used without further purification.

To a solution of the above styrene (1.5 g, 9.1 mmol) in 150 mL of ether was added a solution of Et₂Zn (16 mL, 1.0 M in hexane, 16 mmol). After stirring for 5 min, CH₃CHI₂ (6.0 g of an 84% pure sample, 25 mmol) in 10 mL of ether was added dropwise over 30 min. The reaction mixture was poured into a saturated aqueous NH₄Cl solution (300 mL), and the mixture was extracted with ether (3 \times 200 mL). The combined organic phase was washed with satd

aqueous NaCl solution, dried over MgSO₄, filtered, and concentrated at reduced pressure. The residue was purified by chromatography (silica gel, pentane) to afford 1.2 g (6.2 mmol, 68%) of a mixture of diastereomers of 2-(*p*-methoxyphenyl)-3-methoxy-1-methylcyclopropane that had an appropriate NMR spectrum for the mixture of anisoles (Spectrum S1).

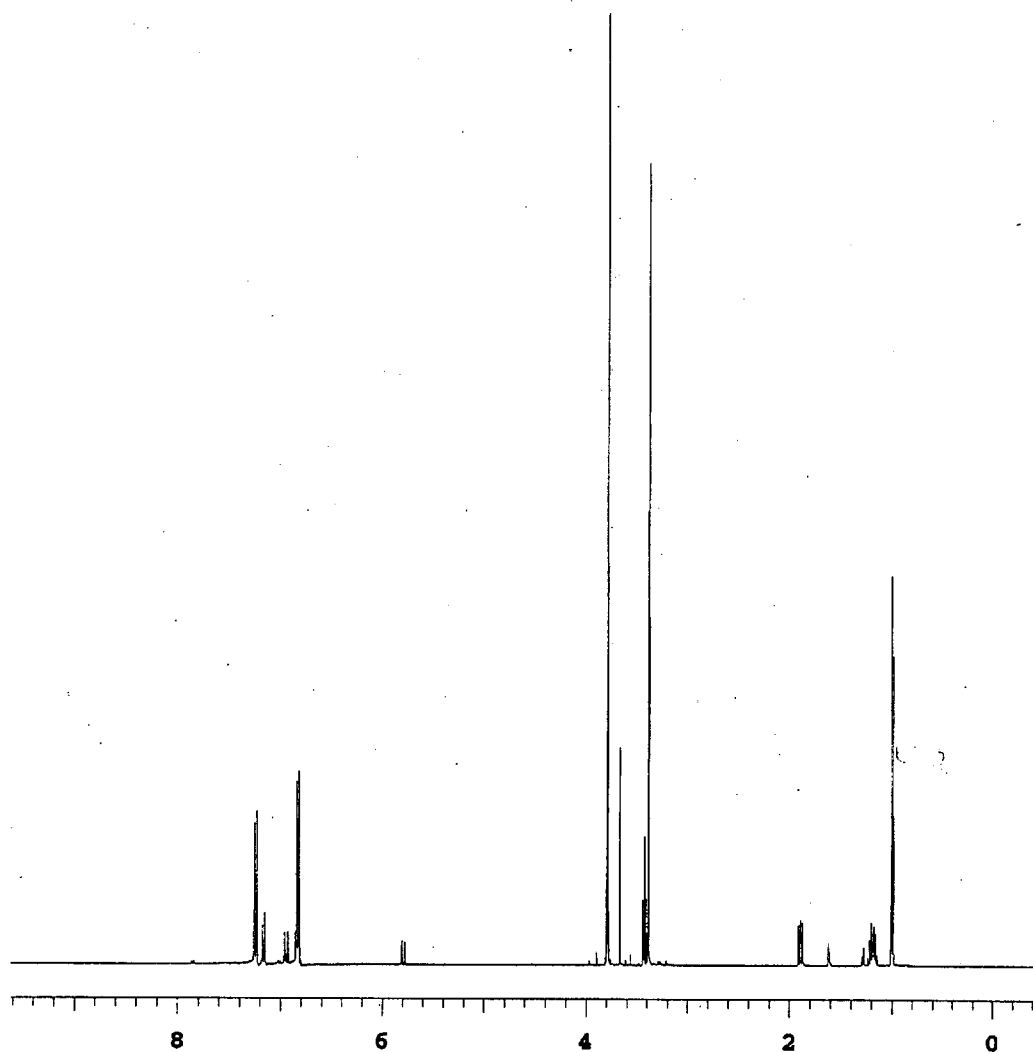
A solution of the above mixture of cyclopropanes (0.35 g, 1.8 mmol) and NaSEt (1 g, 12 mmol) in 5 mL of DMF was sealed in a tube and heated at 250 °C for 24 h. After cooling, the mixture was treated with excess 3 N HCl, and the aqueous mixture was extracted twice with CH₂Cl₂. The combined organic phase was extracted with satd aqueous NaCl solution, dried over Na₂SO₄, filtered, and concentrated at reduced pressure. The residue was purified by chromatography (silica gel, ethyl acetate/hexanes) to give a mixture of isomers of 5c (0.12 g, 0.67 mmol, 37%) as an oil that had an appropriate NMR spectrum for the mixture of phenols (Spectrum S2).

GC analysis of the above mixture (Carbowax 20M) showed that it contained four components in the ratio of 10:20:20:50 in order of elution. The mass spectra of the four components were virtually identical and had molecular ions at $m/z = 178$ (Spectrum S3).

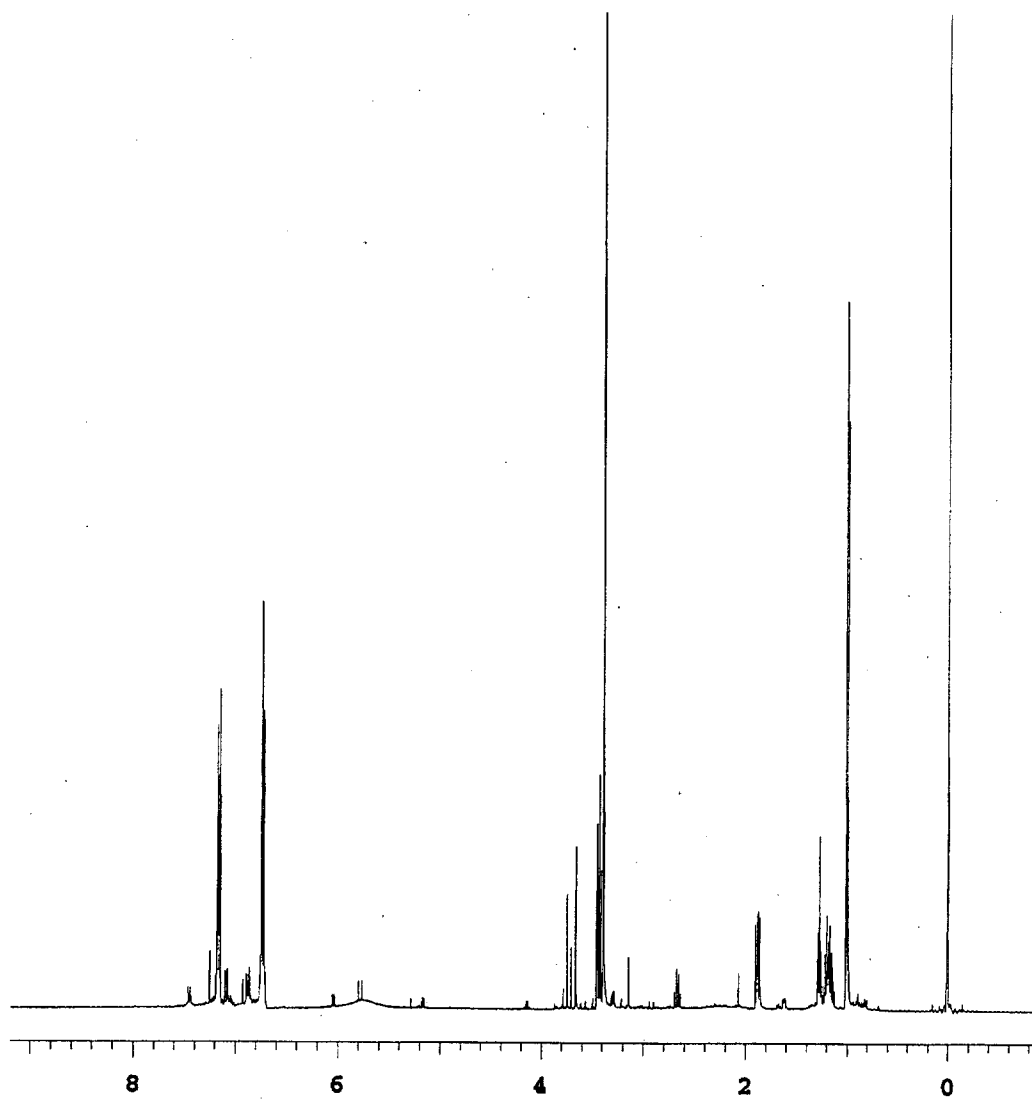
References

- S1. Koreeda, M.; Tanaka, Y. *Tetrahedron Lett.* **1987**, *28*, 143-146.
S2. Yamamoto, Y.; Yatagai, H.; Naruta, Y.; Maruyama, K. *J. Am. Chem. Soc.* **1980**, *102*, 7107-7109.

Spectrum S1. ^1H NMR spectrum of mixture of anisole products.



Spectrum S2. ^1H NMR spectrum of mixture of phenol products (5).



Spectrum S3. Mass spectrum of phenol product (5).

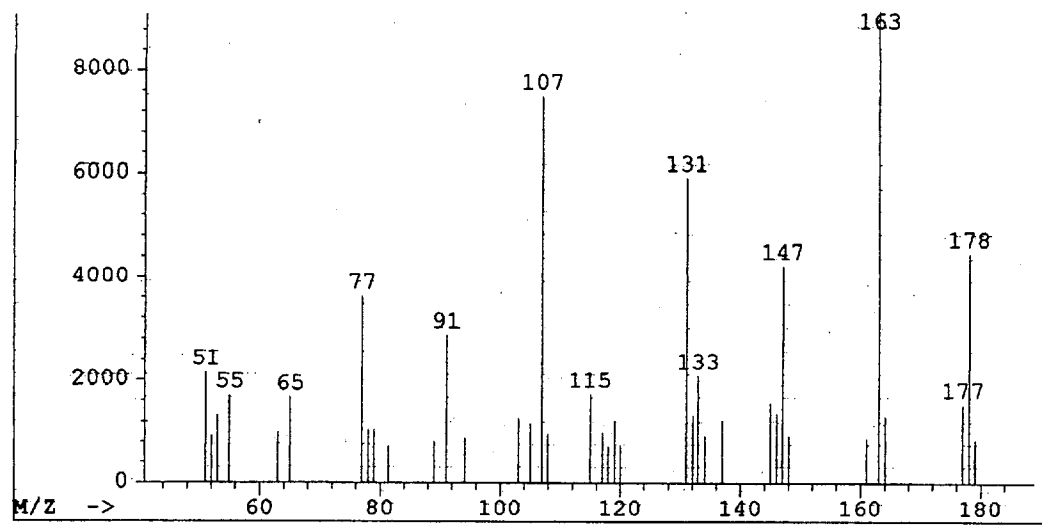


Table S1. Results from P450 Oxidations of Probe 1.^a

Isozyme	Yield of products in nmol			% Conv. ^b	% Rec. ^c	Turnover ^d
	2	3	4			
2B1	10.4	1.6	0.5	1.0	45	21
	14.6	1.6	0.5	1.3	67	28
	11.6	1.5	0.4	1.0	63	23
2B4	32.6	2.5	1.0	2.8	70	180
	26.9	2.2	0.8	2.3	73	150
Δ 2B4	66.2	3.4	1.5	5.5	62	355
	59.1	3.0	1.3	4.9	62	317
Δ 2B4 T302A	3.7	0.2	0.2	0.3	83	20
	3.6	0.2	0.2	0.3	73	20
Δ 2E1	8.4	0.8	0.2	0.7	64	47
	7.4	0.9	0.2	0.7	69	42
Δ 2E1 T303A	2.5	0.4	0.5	0.3	64	17
	4.3	0.4	0.6	0.4	67	26

^a0.6 nmol of P450 and reductase were used in studies with 2B1; 0.2 nmol of P450 and 0.4 nmol of reductase were used in all other reactions. ^bPercent conversion of probe. ^cPercent recovery of probe. ^dNumber of enzyme turnovers.

Table S2. Results from P450 Oxidations of Probe 6.^a

Isozyme	<i>(Relative)</i> % Yield of products					Turnover ^b
	7a	7b	7c	8	9	
2B1 batch 1	12	19	7	62	0	nd
	13	16	6	66	0	nd
	9	9	5	77	0	nd
2B1 batch 2	17	10	17	54	0	30
	10	6	12	78	0	18
2B4	4	1	7	88	0	120
	3	1	8	88	0	86
	3	1	5	91	0	89
Δ 2B4	3	4	13	79	1	nd
	4	3	11	82	1	61
Δ 2B4 T302A	20	10	11	36	23	nd
	6	16	7	52	21	14
	3	15	6	57	19	9
Δ 2E1 batch 1	13	16	10	55	6	30
	4	20	20	42	14	12
Δ 2E1 batch 2	1	7	17	68	6	88
	1	7	15	71	6	122
Δ 2E1 T303A	0	10	15	57	18	nd
	4	16	11	57	12	13
	5	15	12	54	14	14

^a0.6 nmol of P450 and reductase were used in studies with 2B1; 0.2 nmol of P450 and 0.4 nmol of reductase were used with 2B4, Δ 2B4, and Δ 2B4 T302A; 0.4 nmol of P450 and 0.8 nmol of reductase were used with Δ 2E1 and Δ 2E1 T303A. ^bNumber of enzyme turnovers; nd = not determined.

Table S3. Results of Stability and Recovery Control Reactions.

Enzyme	Substrate	Amount (nmol)	Experiment (percent recovery)		
			A ^a	B ^b	C ^c
2B1	2	67.3	91	105	105
	3	56.1	78	113	112
	4	28.7	0	87	99
	4 (with 1.3 μ mol 1) ^d	25.2	99	105	102
	4 (with 1.3 μ mol 10) ^e	1.6	134	105	71 ^f
Δ 2B4	8	8.5	53	80	69
Δ 2B4 T302A	8	8.5	72	61	68
Δ 2B4	9	9.5	60	69	58
Δ 2B4 T302A	9	9.5	82	75	90

^aThe enzyme system was fully competent. ^bThe P450 and reductase enzymes were omitted from the system. ^cThe NADPH was omitted from the system. ^dThese reactions were conducted with 4 and substrate 1 present. ^eThese reactions were conducted with 4 and surrogate substrate 10 present. ^fReaction conducted with 0.8 nmol of 4.