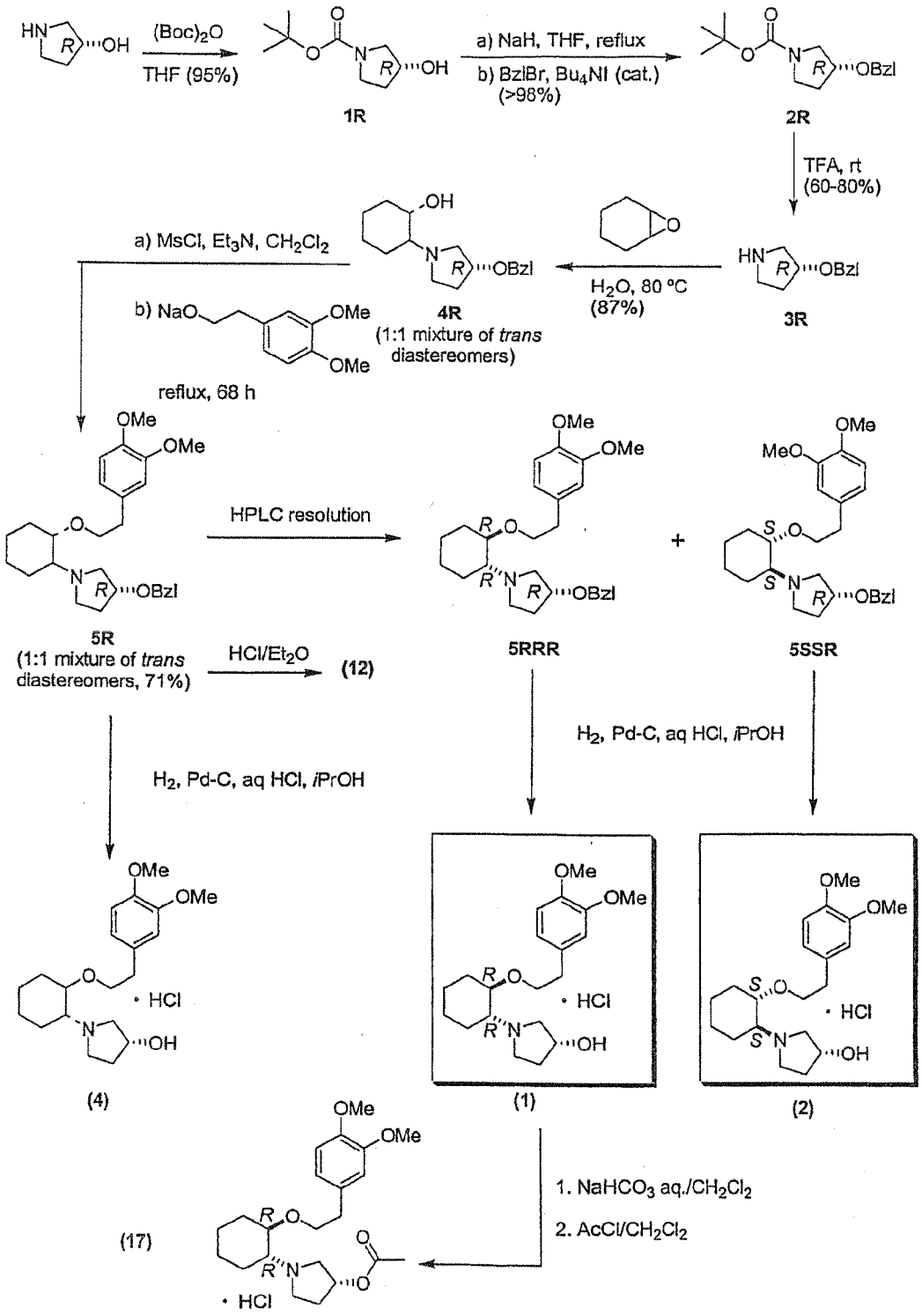
Figure 1


(Boc)2O
THF (95%)
1R
a) NaH, THF, reflux
b) BzlBr, Bu4NI (cat.)
(>98%)
2R
TFA, rt
(60-80%)
3R
H2O, 80 °C
(87%)
a) MsCl, Et3N, CH2Cl2
b) NaO
OMe
OMe
4R
(1:1 mixture of trans diastereomers)
reflux, 68 h
5R
(1:1 mixture of trans diastereomers, 71%)
HPLC resolution
5RRR
5SSR
HCl/Et2O
(12)
H2, Pd-C, aq HCl, iPrOH
(4)
(1)
(2)
1. NaHCO3 aq./CH2Cl2
2. AcCl/CH2Cl2
(17)
· HCl

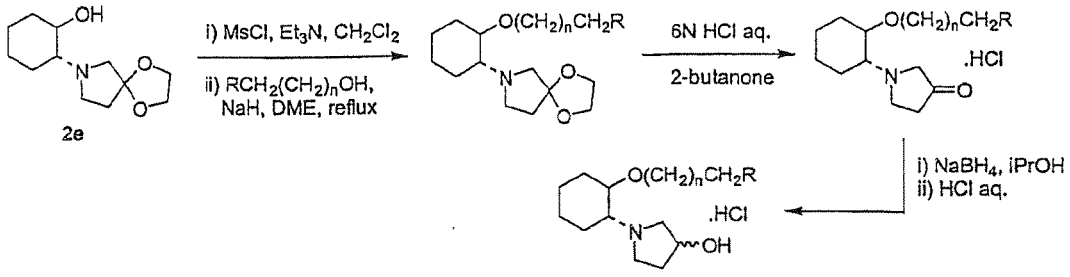


Figure 2

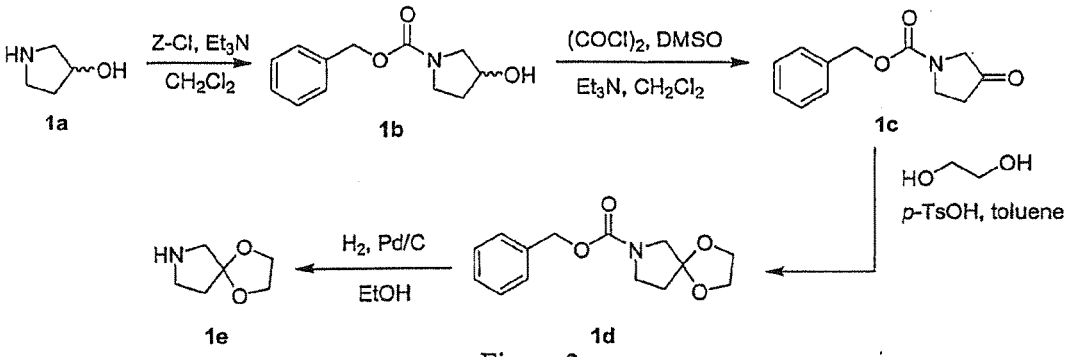


Figure 3

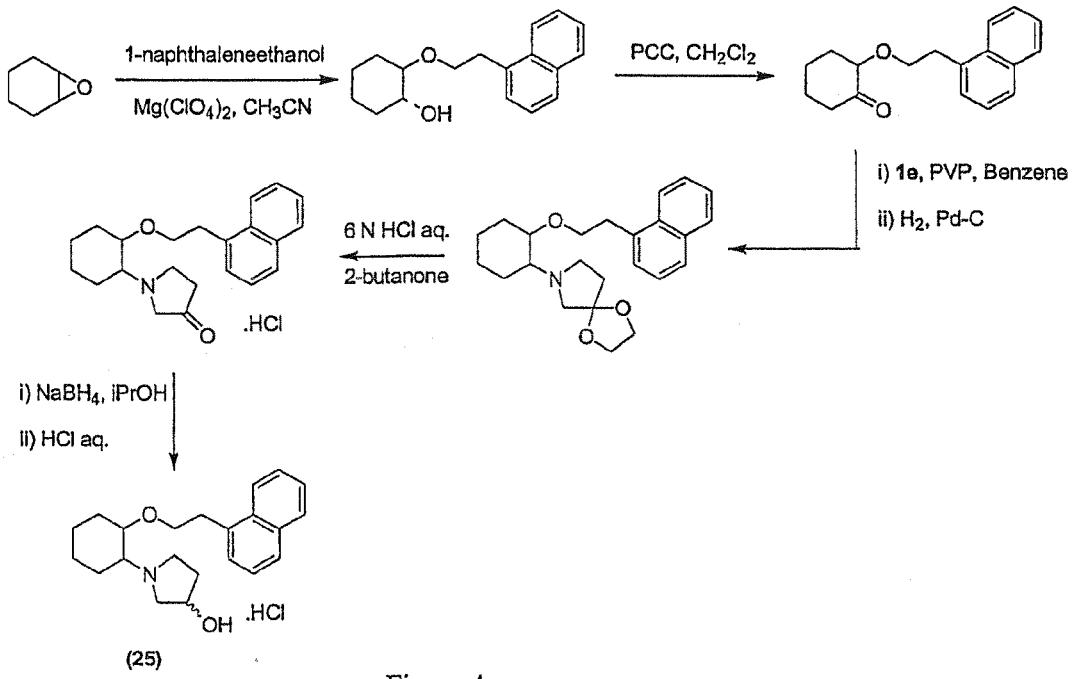


Figure 4

Figure 5

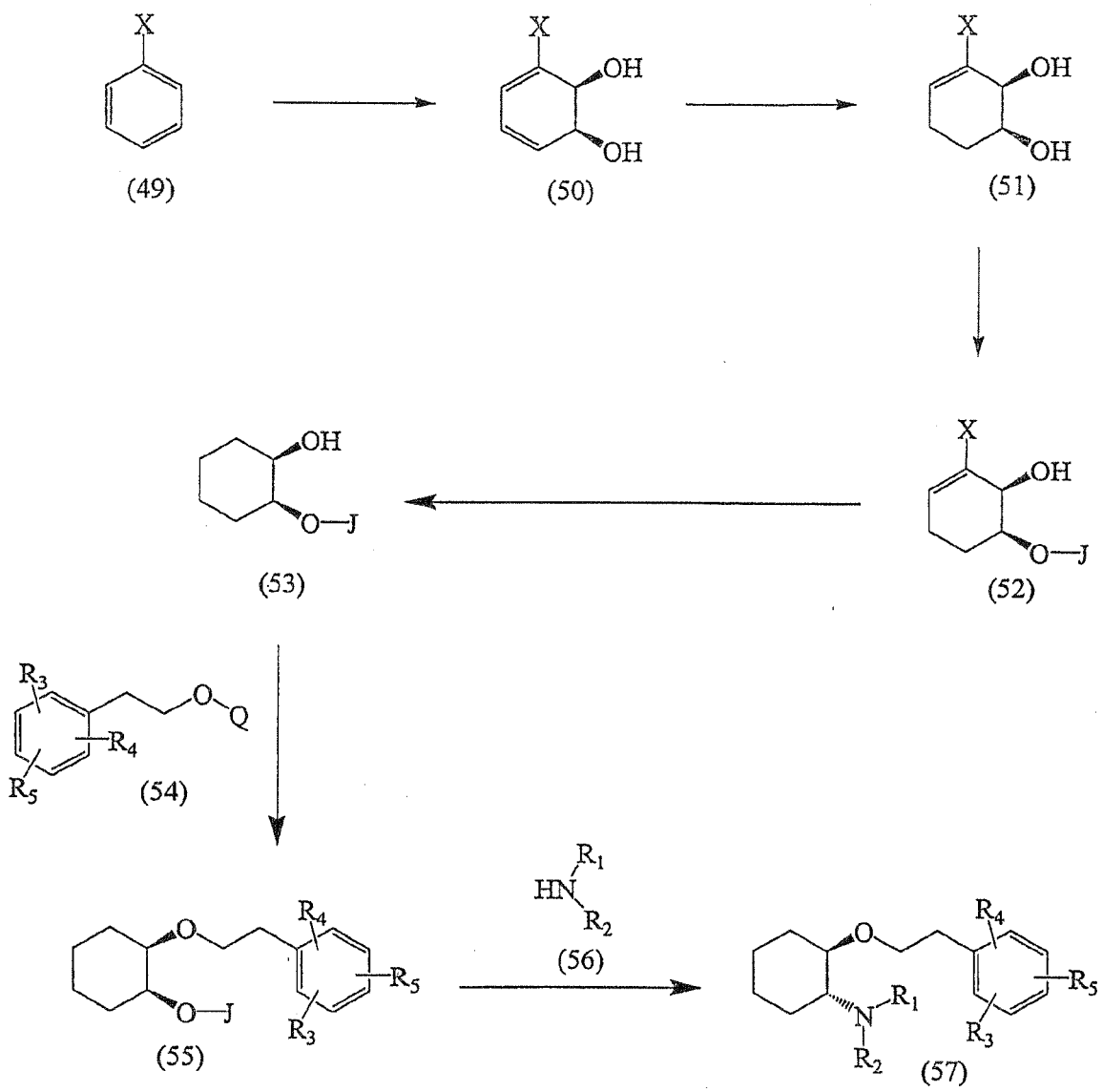


Figure 6

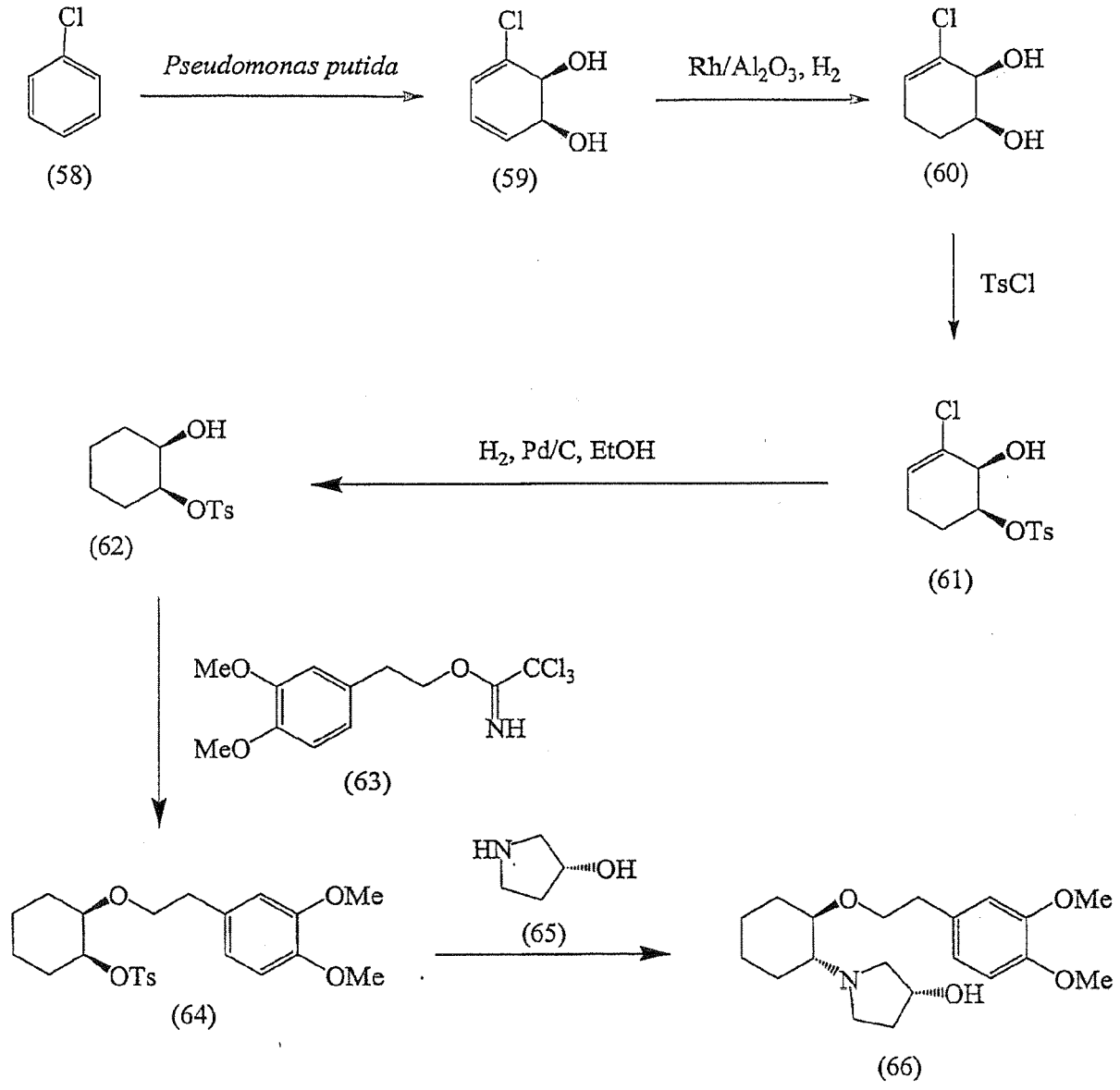

Cl
Pseudomonas putida
OH
OH
Rh/Al2O3, H2
TsCl
H2, Pd/C, EtOH
OTs
MeO
MeO
CCl3
NH
HN
OH
OMe
OMe
N
(58)
(59)
(60)
(61)
(62)
(63)
(64)
(65)
(66)

Figure 7

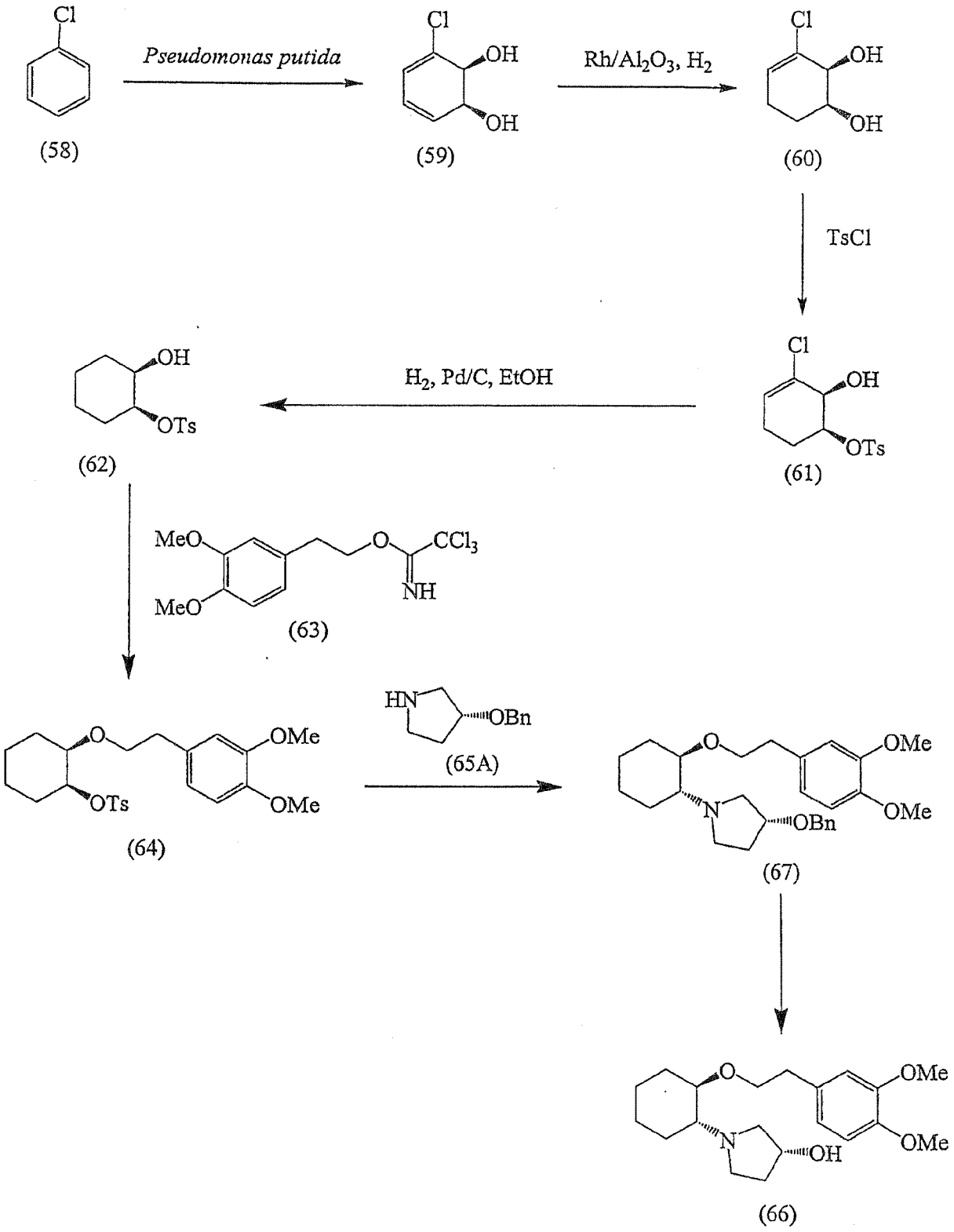

Cl
(58)
Pseudomonas putida
Cl
OH
OH
(59)
Rh/Al2O3, H2
Cl
OH
OH
(60)
TsCl
Cl
OH
OTs
(61)
H2, Pd/C, EtOH
OH
OTs
(62)
MeO
MeO
O
CCl3
NH
(63)
HN
OBn
(65A)
O
OMe
OTs
OMe
(64)
O
OMe
N
OBn
OMe
(67)
O
OMe
N
OH
OMe
(66)

Figure 8

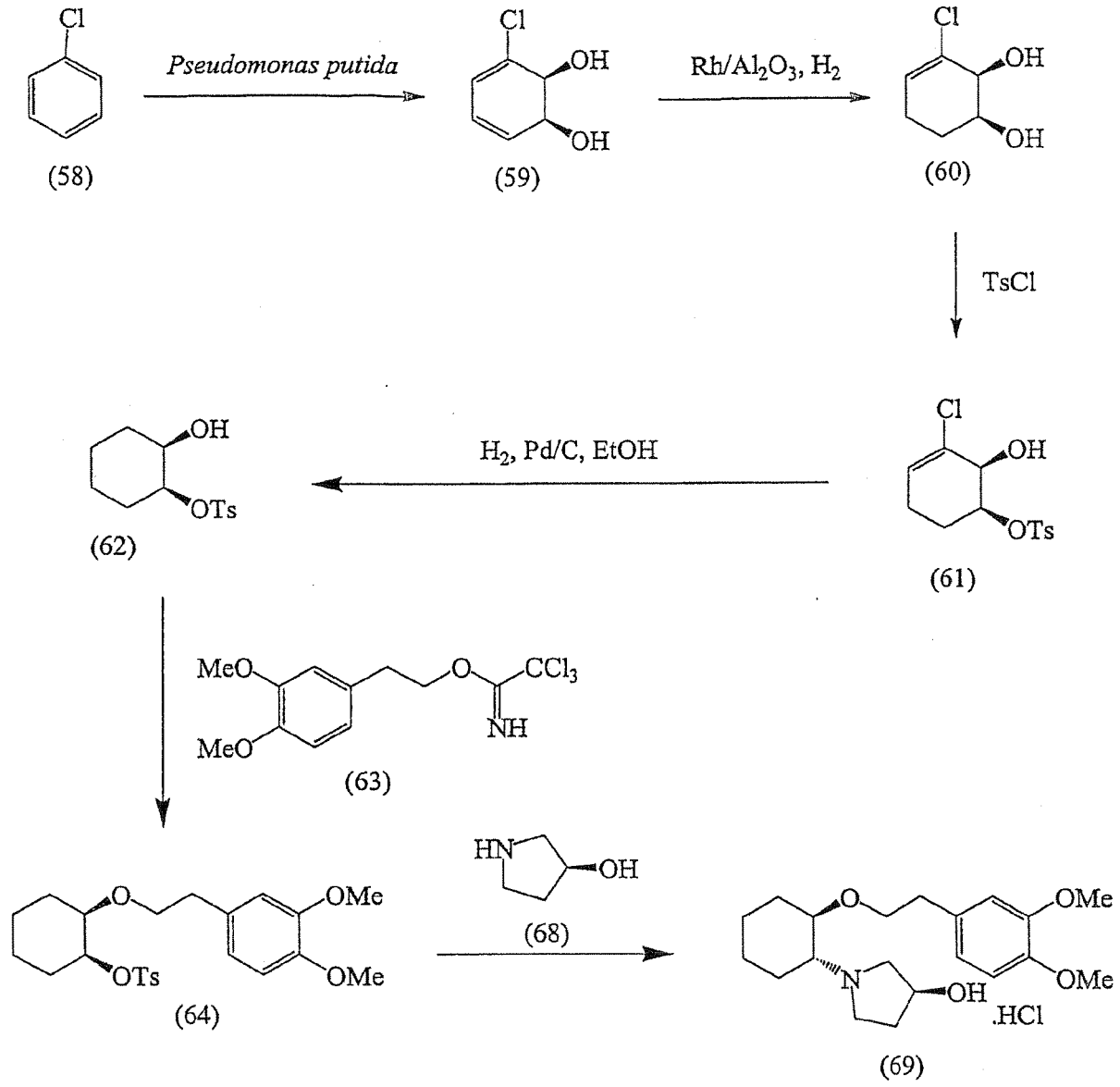

Cl
Pseudomonas putida
OH
OH
Rh/Al2O3, H2
TsCl
H2, Pd/C, EtOH
OTs
MeO
CCl3
NH
HN
OMe
(58)
(59)
(60)
(61)
(62)
(63)
(64)
(68)
(69)
.HCl

Figure 9

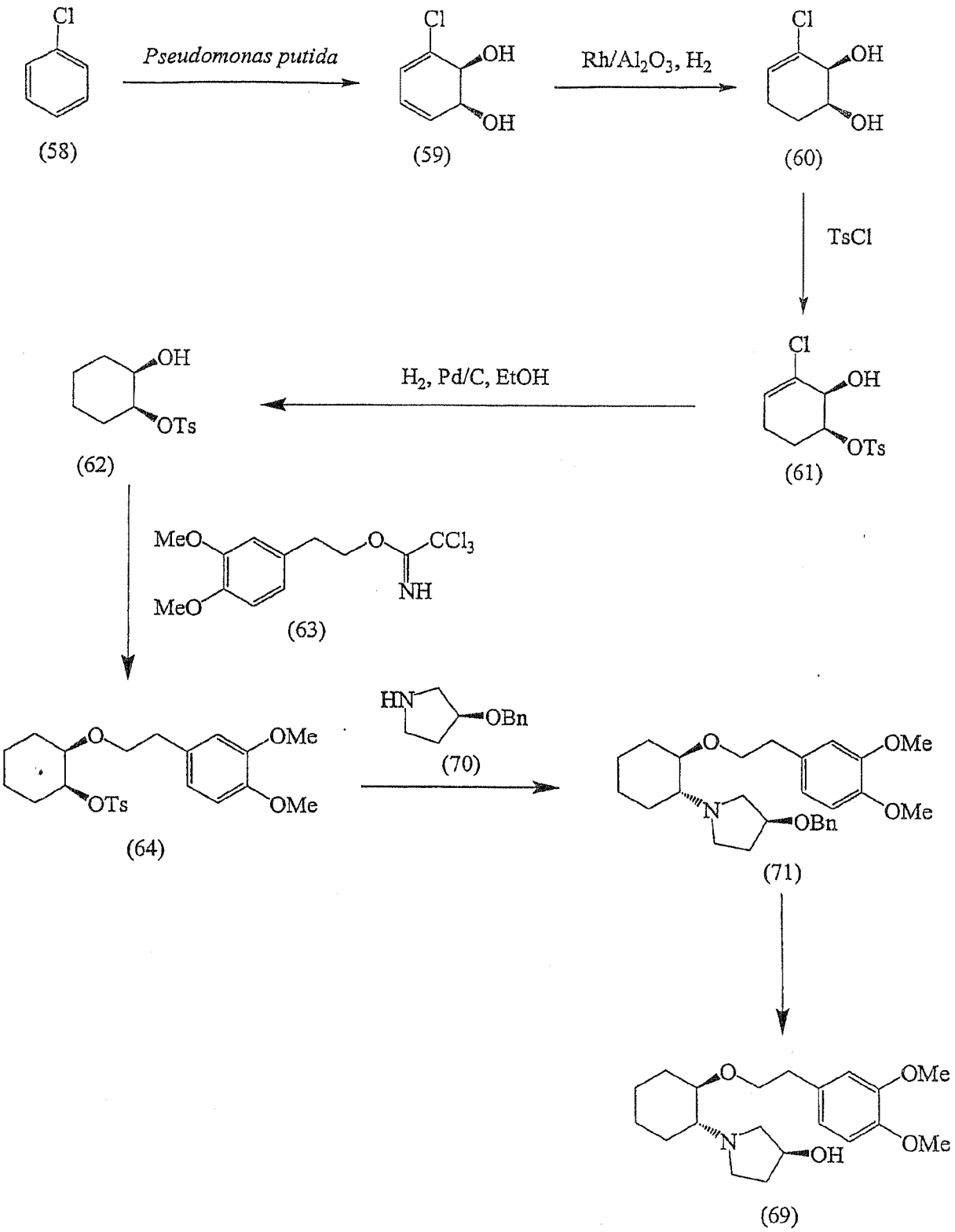

Cl
Pseudomonas putida
OH
OH
Rh/Al2O3, H2
(58)
(59)
(60)
TsCl
H2, Pd/C, EtOH
OTs
(61)
(62)
MeO
MeO
CCl3
NH
(63)
HN
OBn
(70)
OMe
OMe
(64)
(71)
(69)

Figure 10

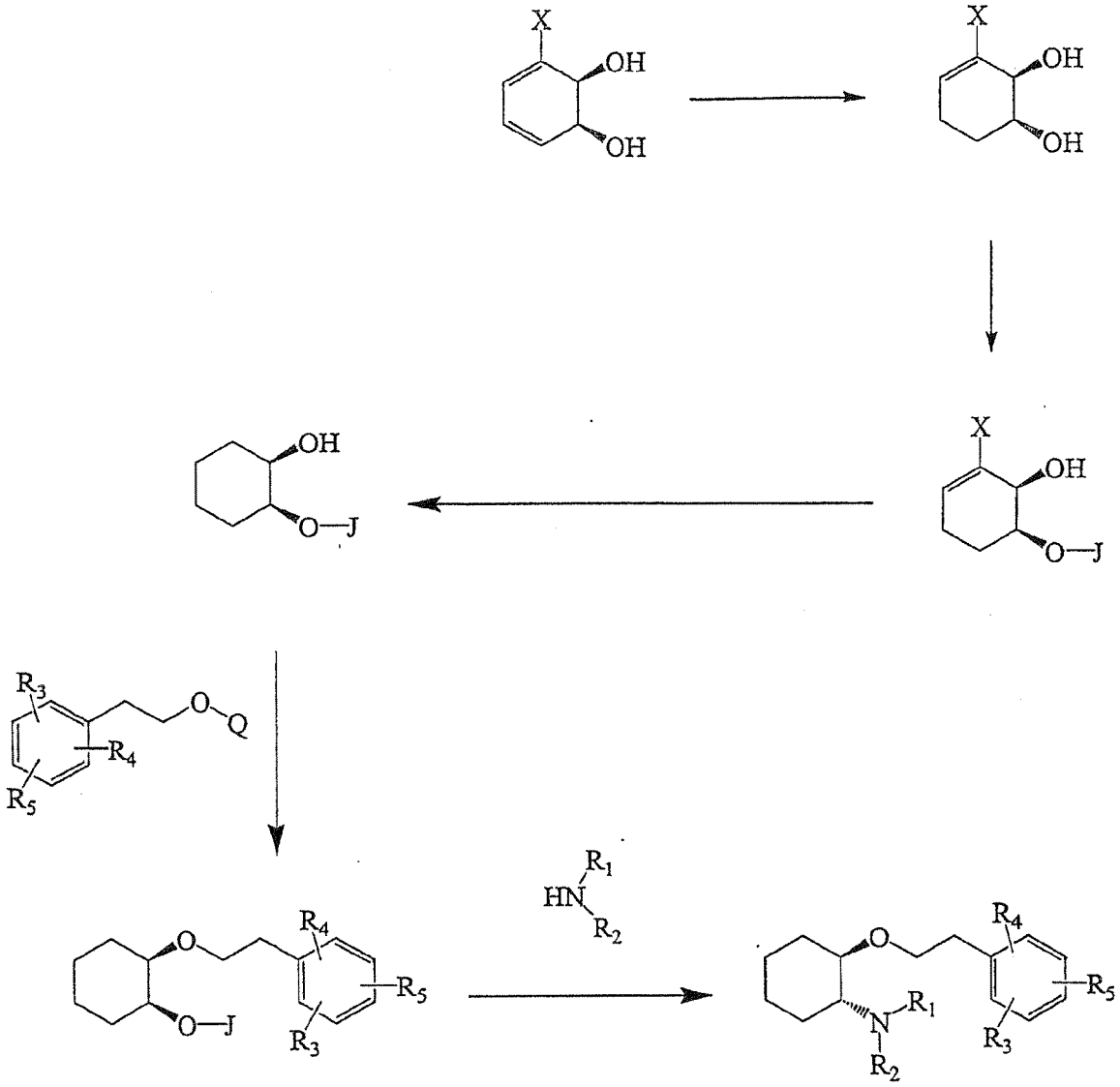

X
OH
OH
X
OH
O—J
OH
O—J
X
OH
O—J
R3
R4
R5
O
Q
R1
HN
R2
R4
R5
R3
O
O—J
R4
R5
R3
O
R1
N
R2

Figure 11

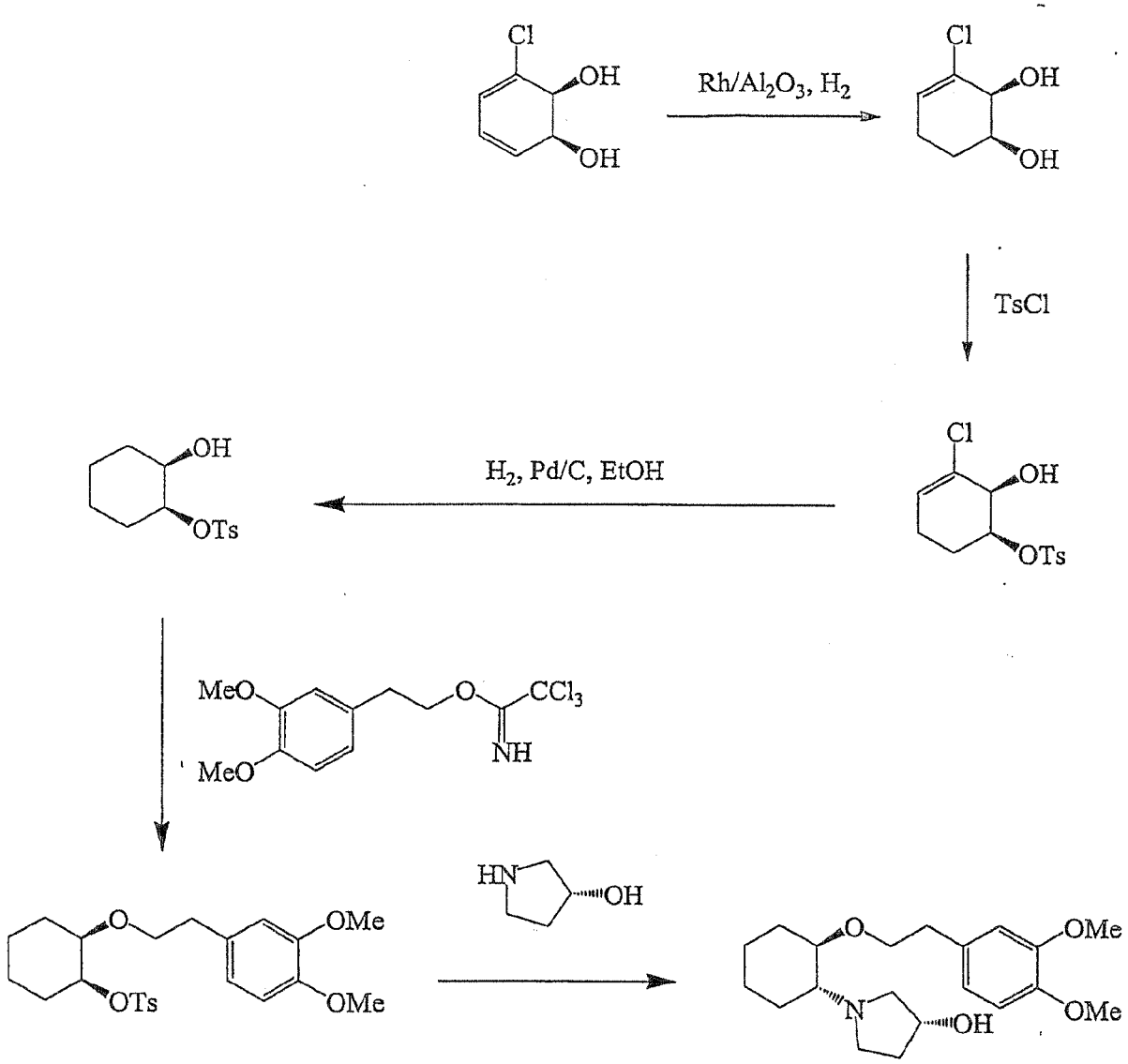

Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OTs
OMe
OMe
O
N
OH
OMe
OMe

Figure 12

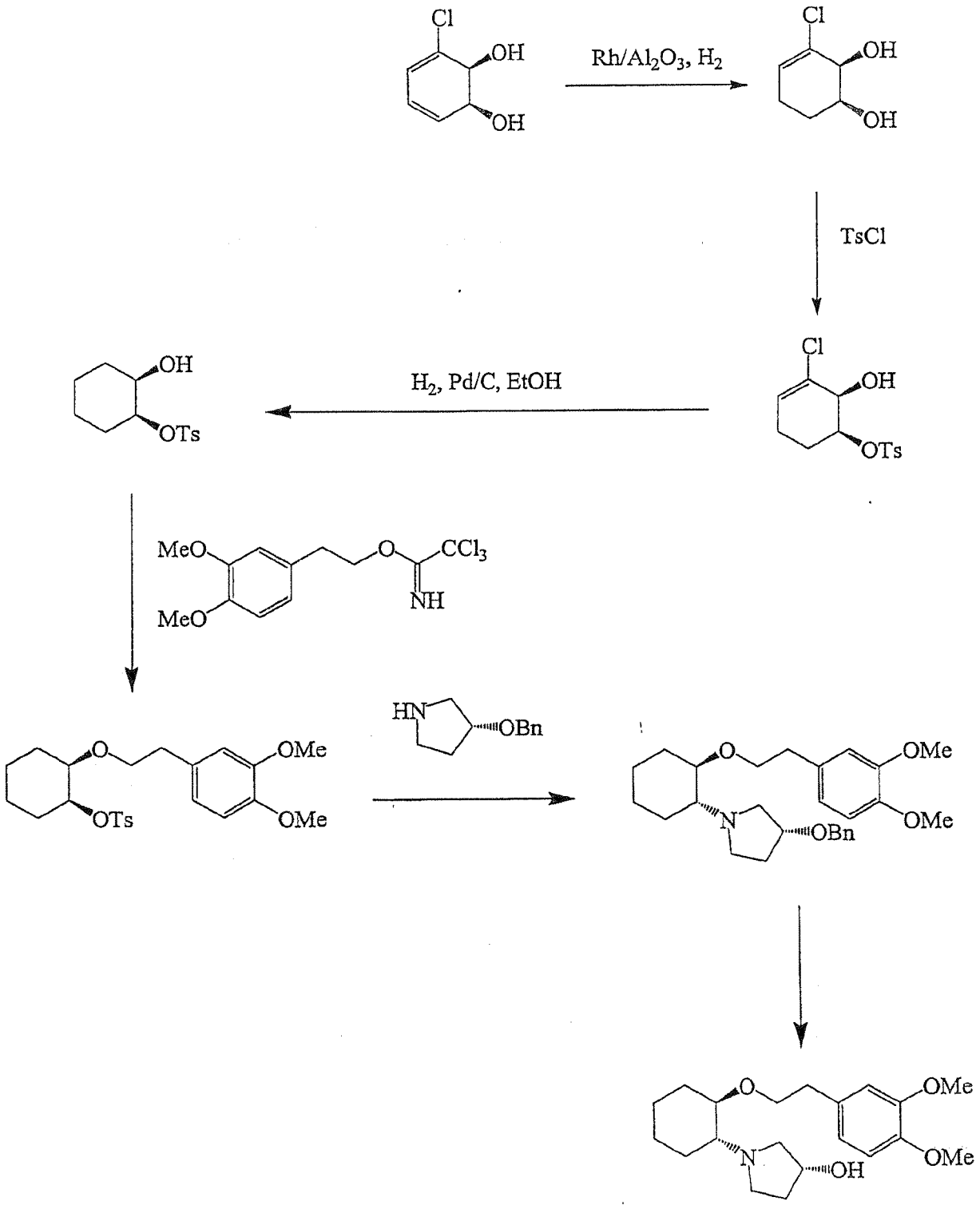

Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 13

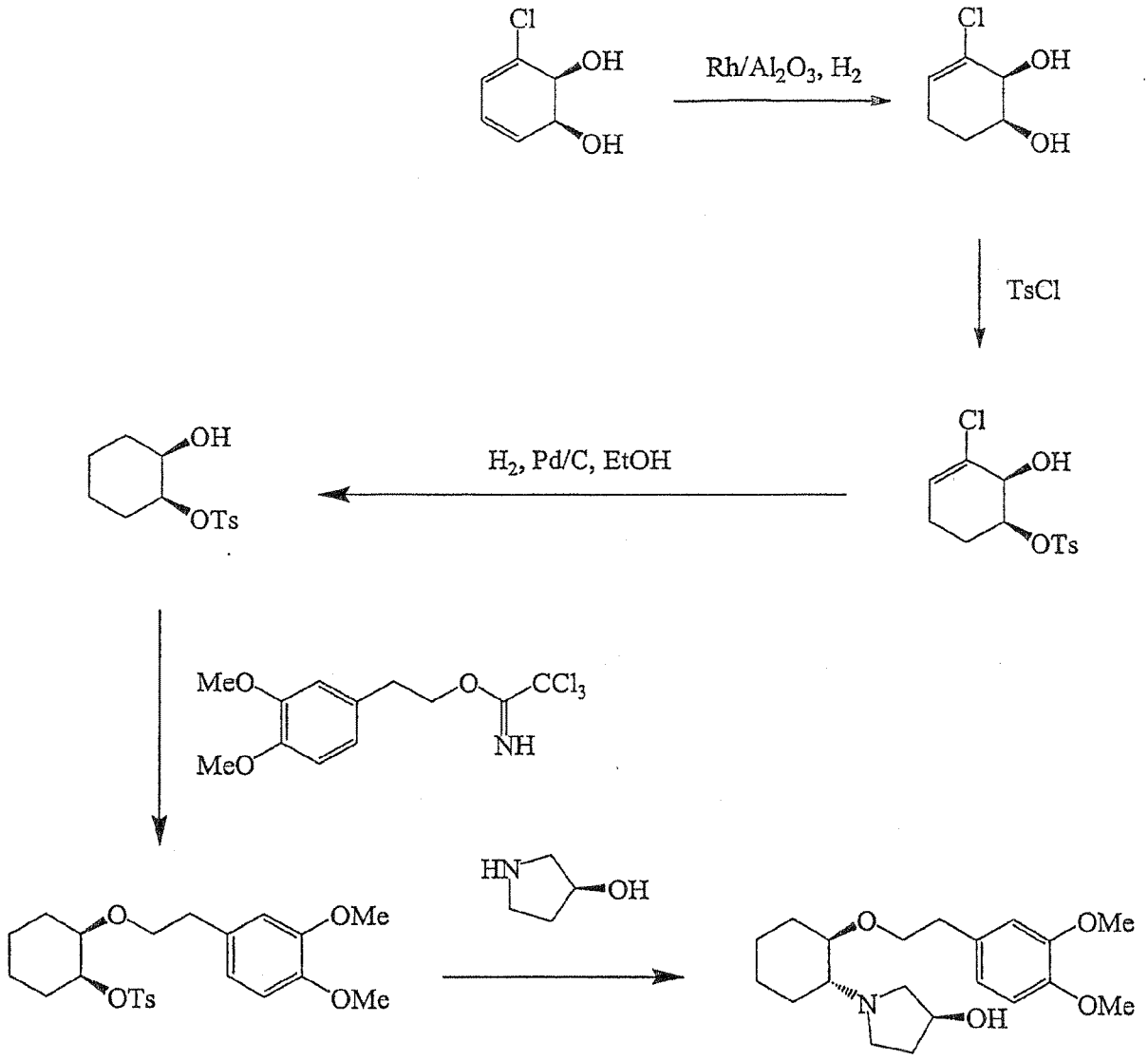

Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OTs
OMe
OMe
O
N
OH
OMe
OMe

Figure 14

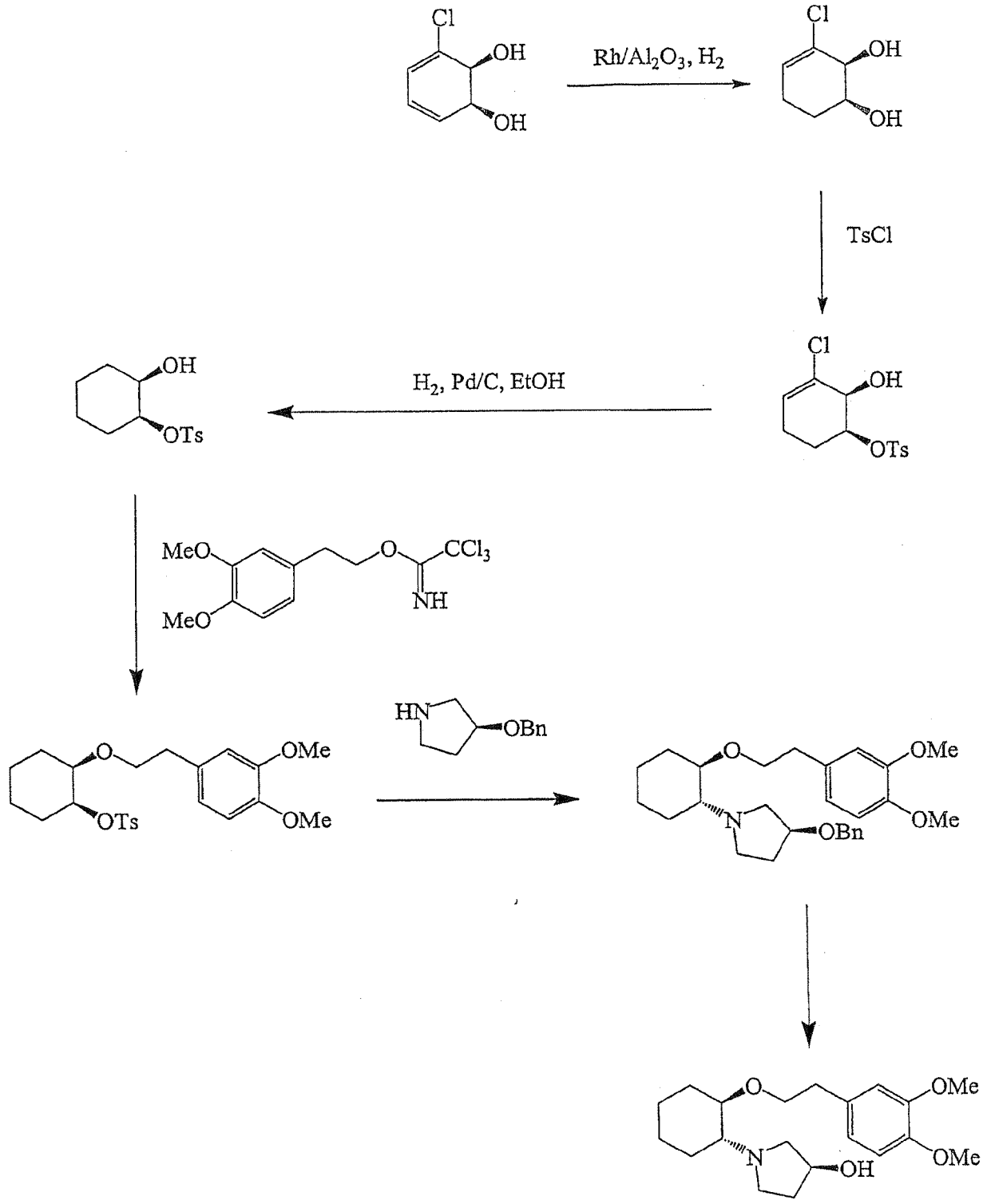

Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OMe
OTs
OMe
O
OMe
N
OBn
OMe
O
OMe
N
OH
OMe

Figure 15

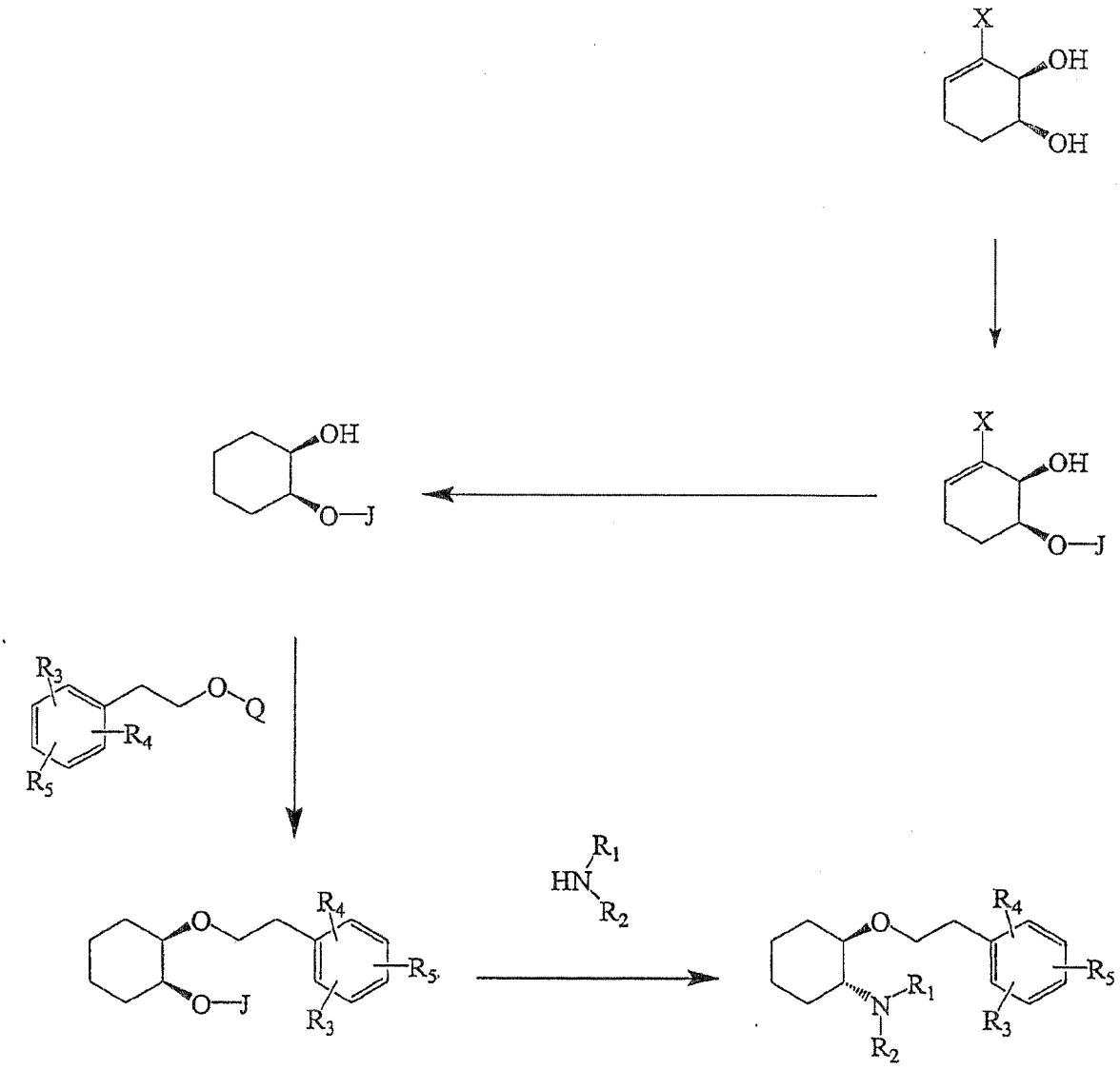


Figure 16

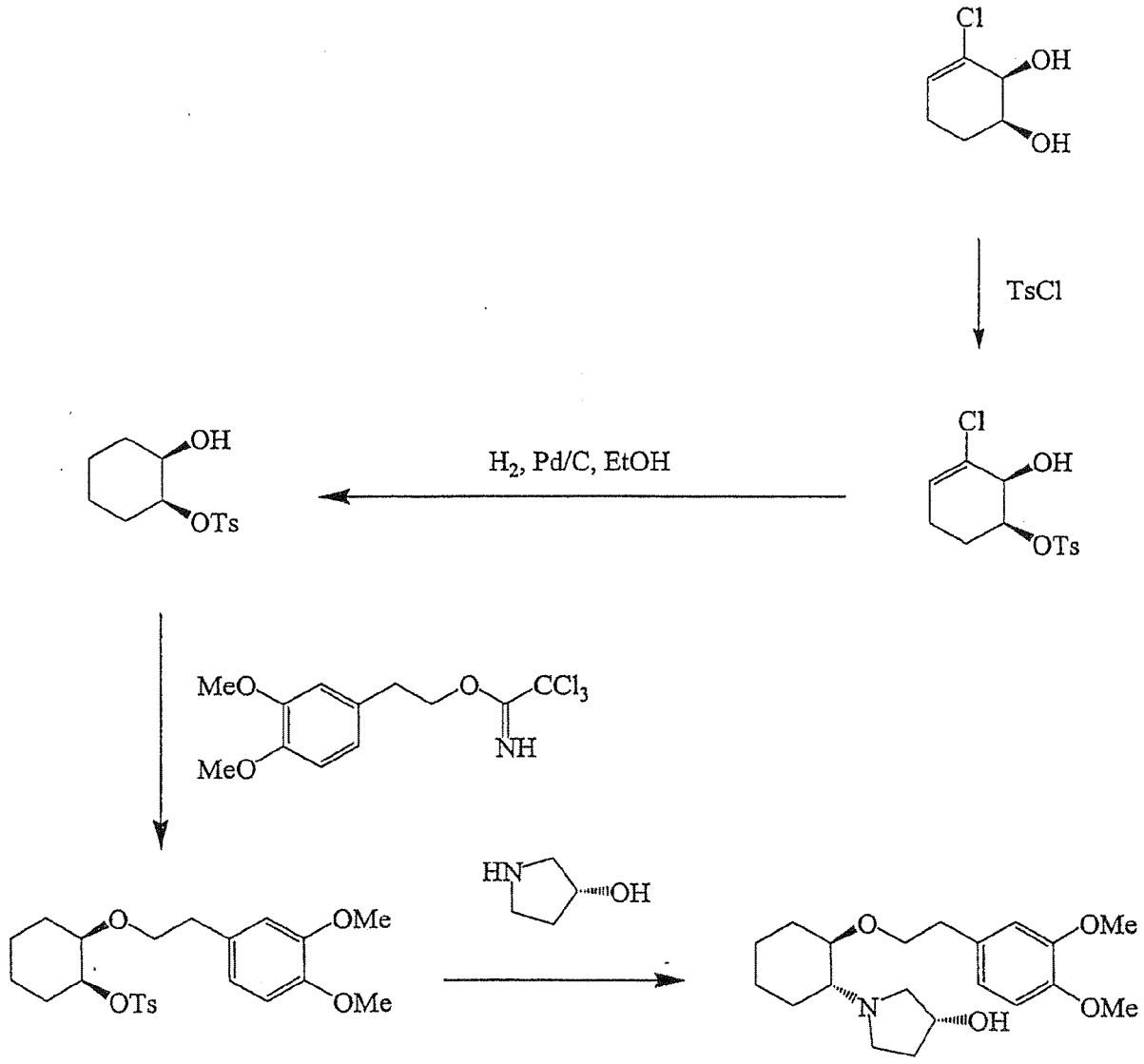

Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OTs
OMe
OMe
O
N
OH
OMe
OMe

Figure 17

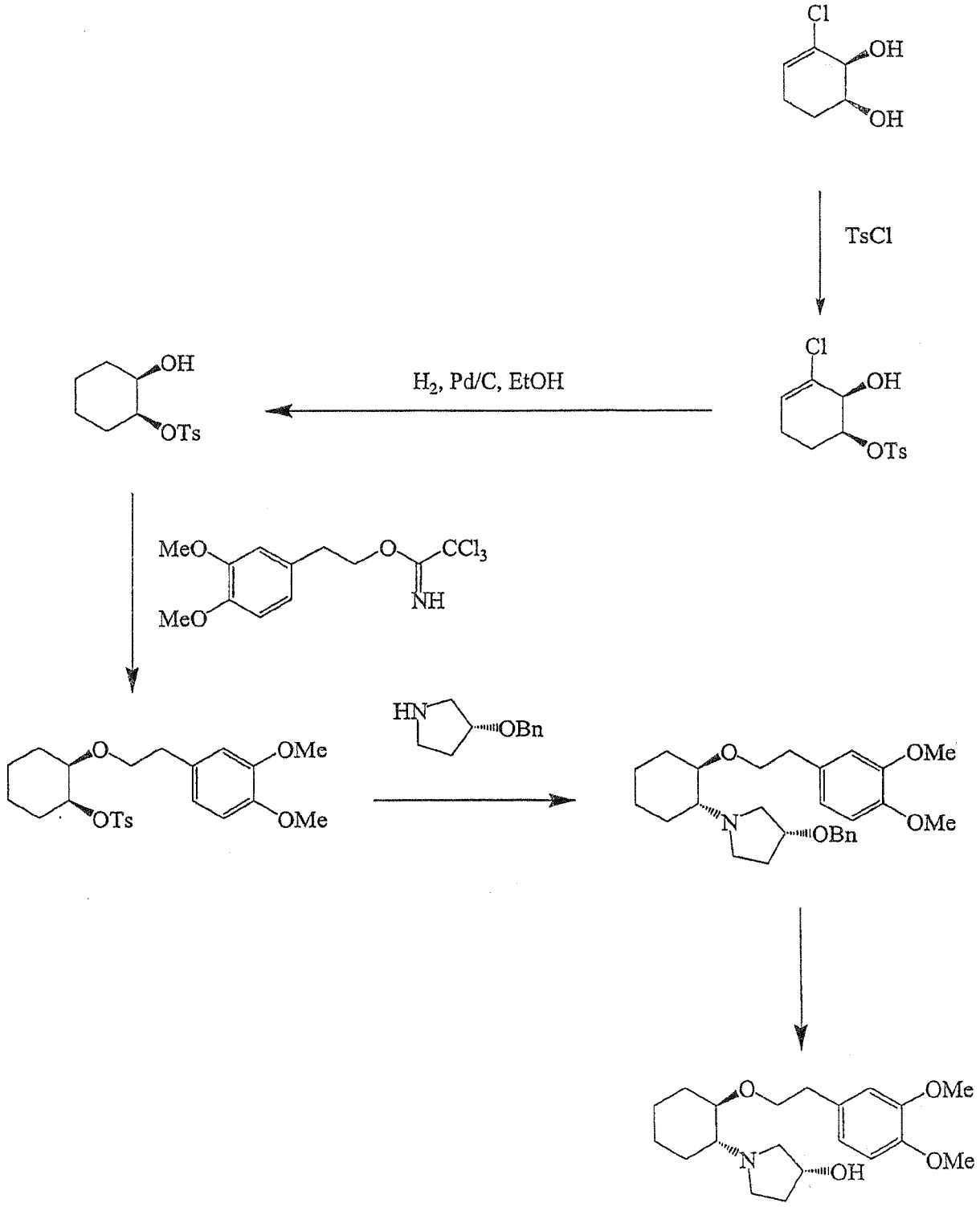

Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 18

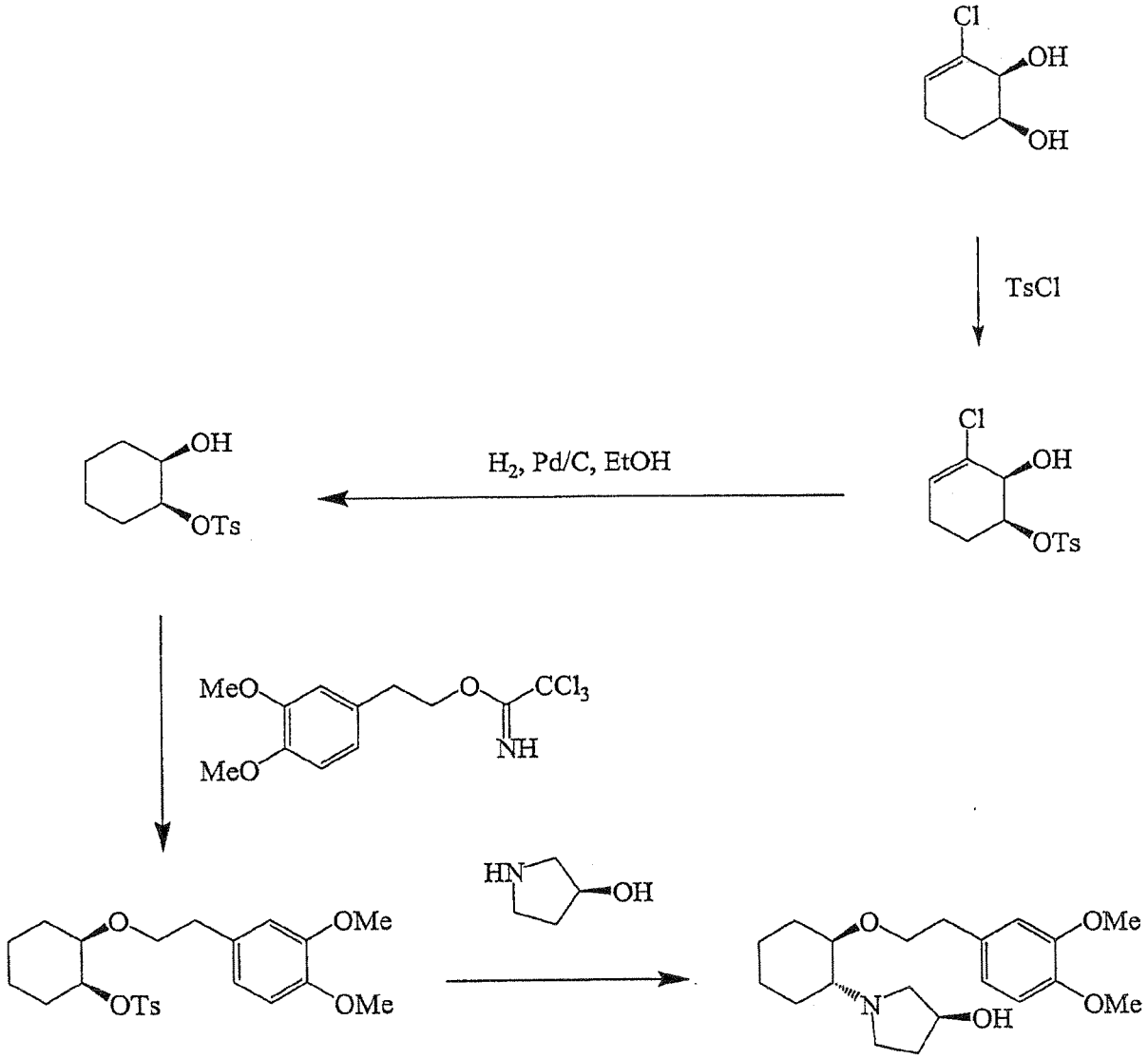

Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OTs
OMe
O
OMe
N
OH
OMe

Figure 19

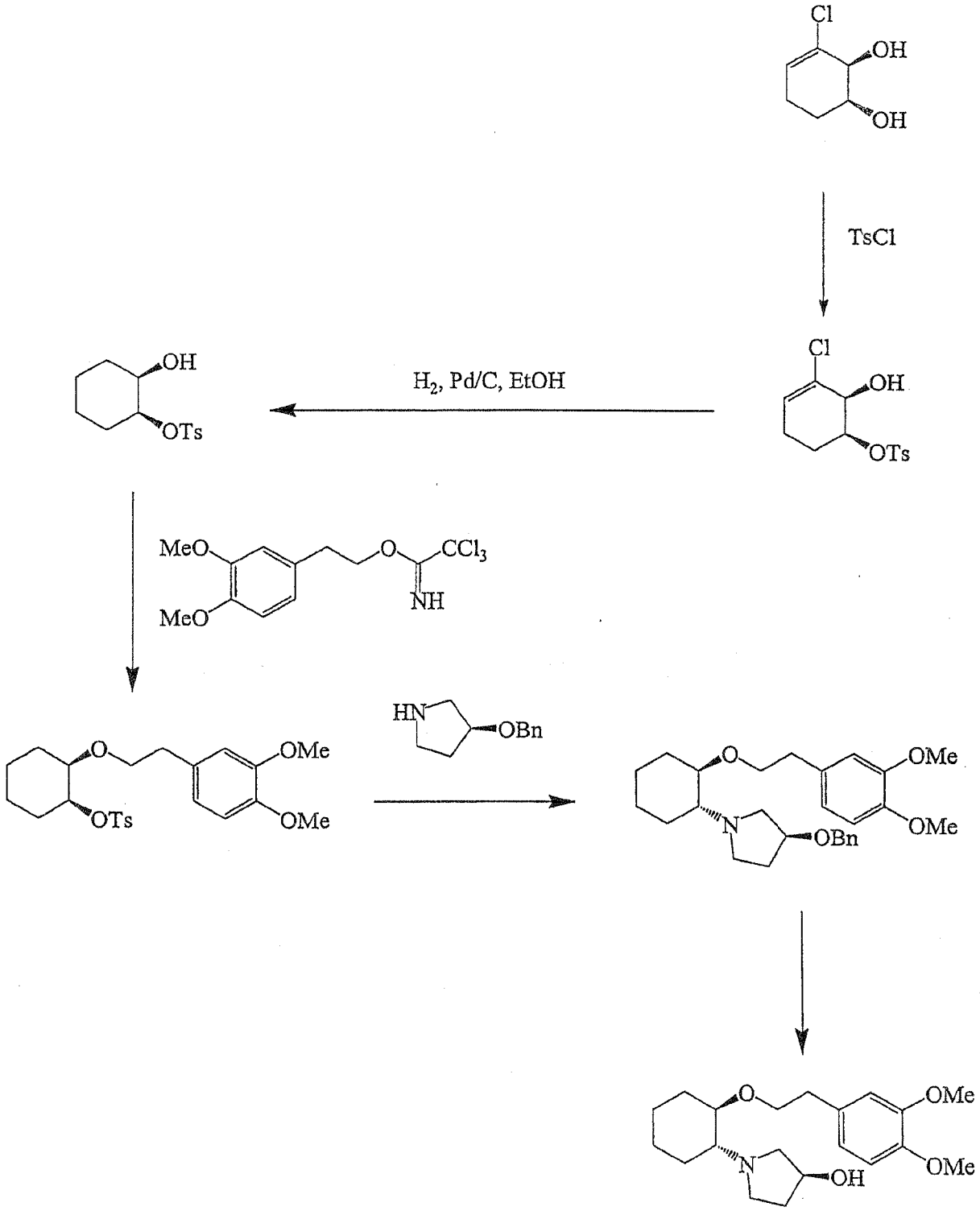

Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 20

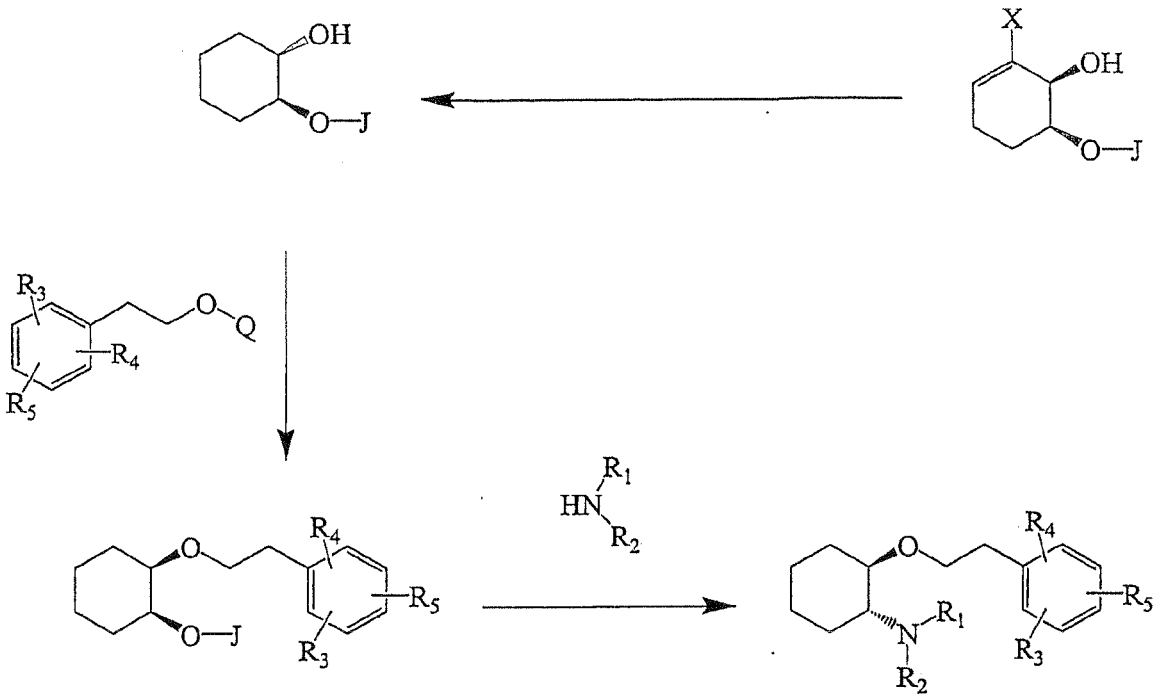


Figure 21

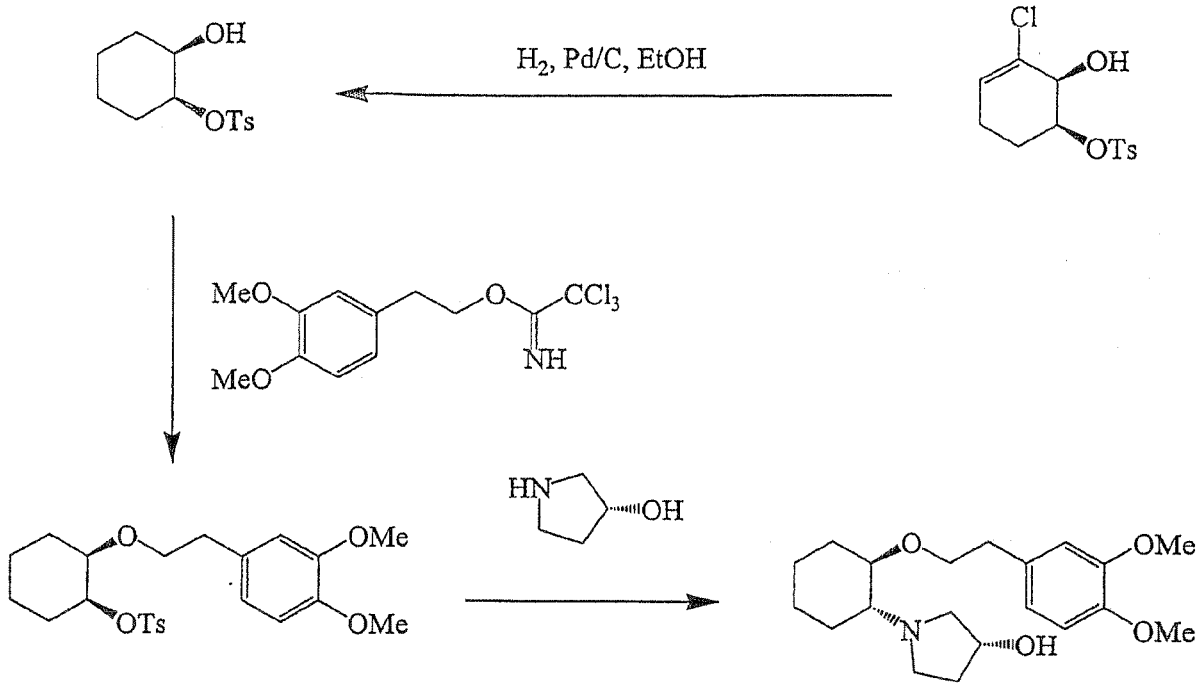

OH
OTs
H2, Pd/C, EtOH
Cl
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OTs
OMe
OMe
O
N
OH
OMe
OMe

Figure 22

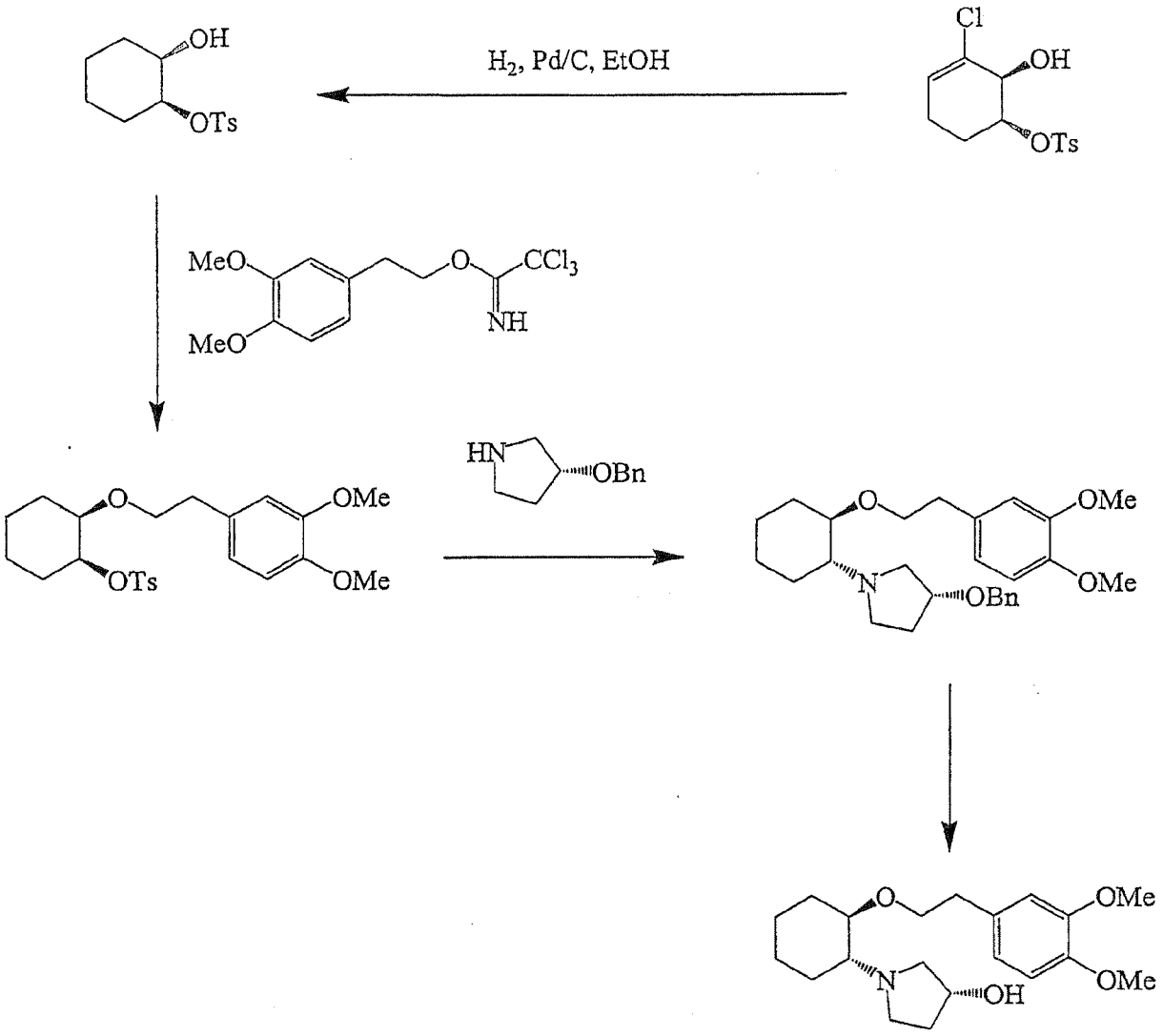

OH
OTs
H2, Pd/C, EtOH
Cl
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 23

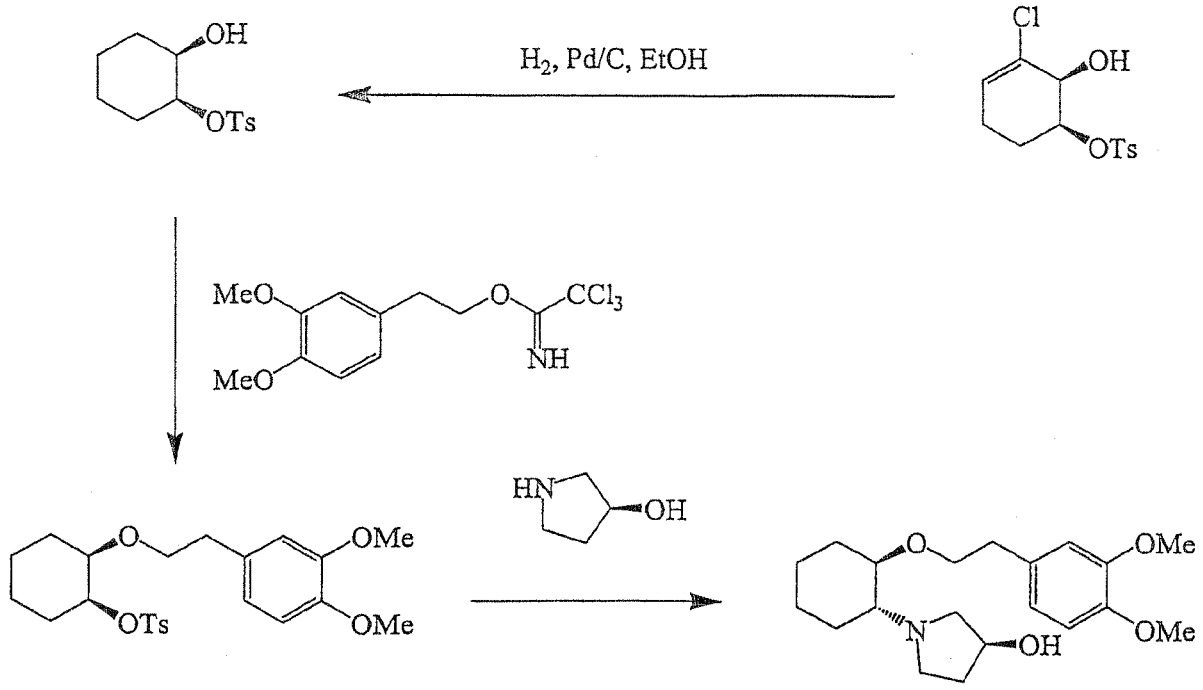

OH
OTs
H2, Pd/C, EtOH
Cl
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OTs
OMe
OMe
O
N
OH
OMe
OMe

Figure 24

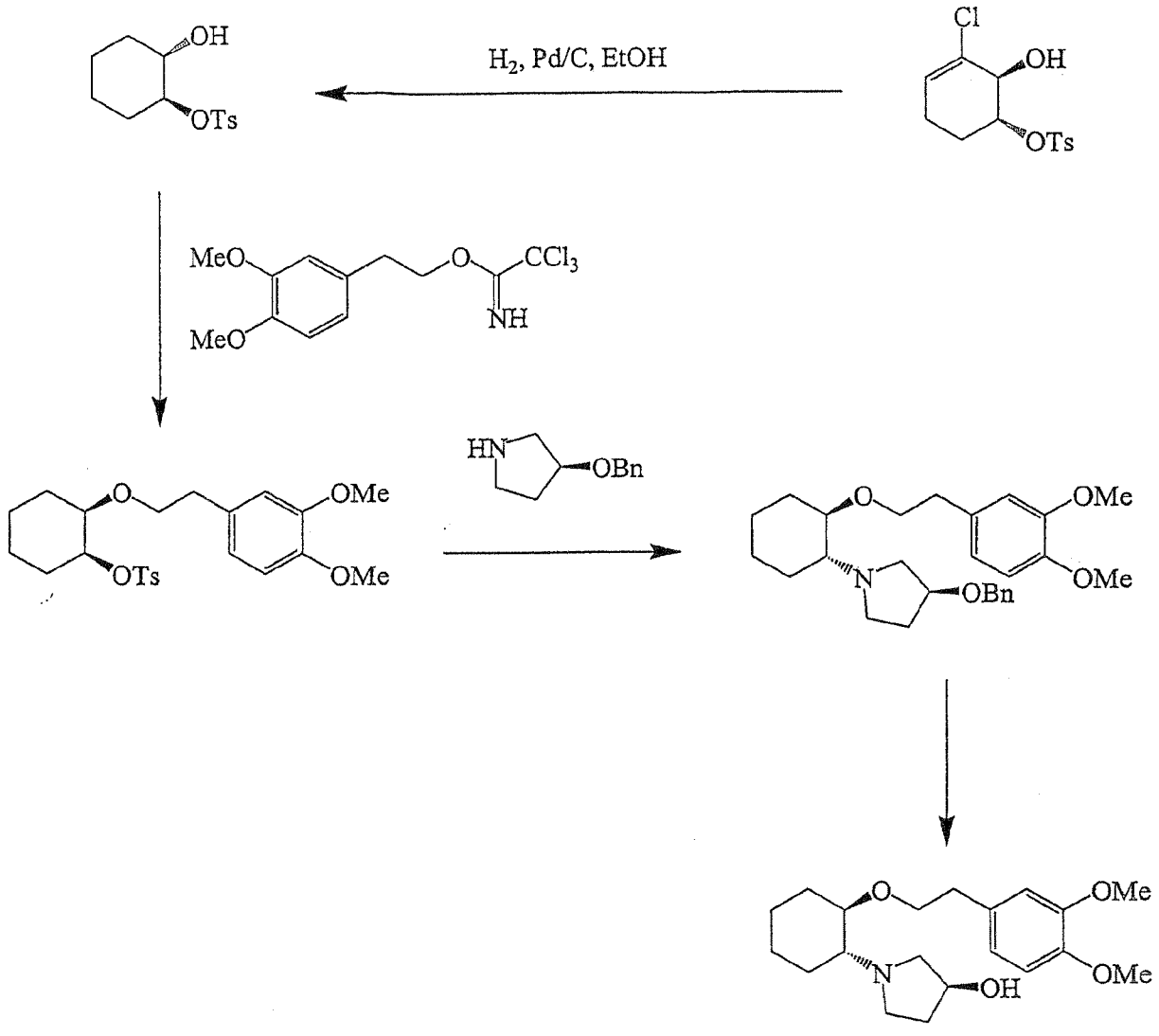

OH
OTs
H2, Pd/C, EtOH
Cl
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 25

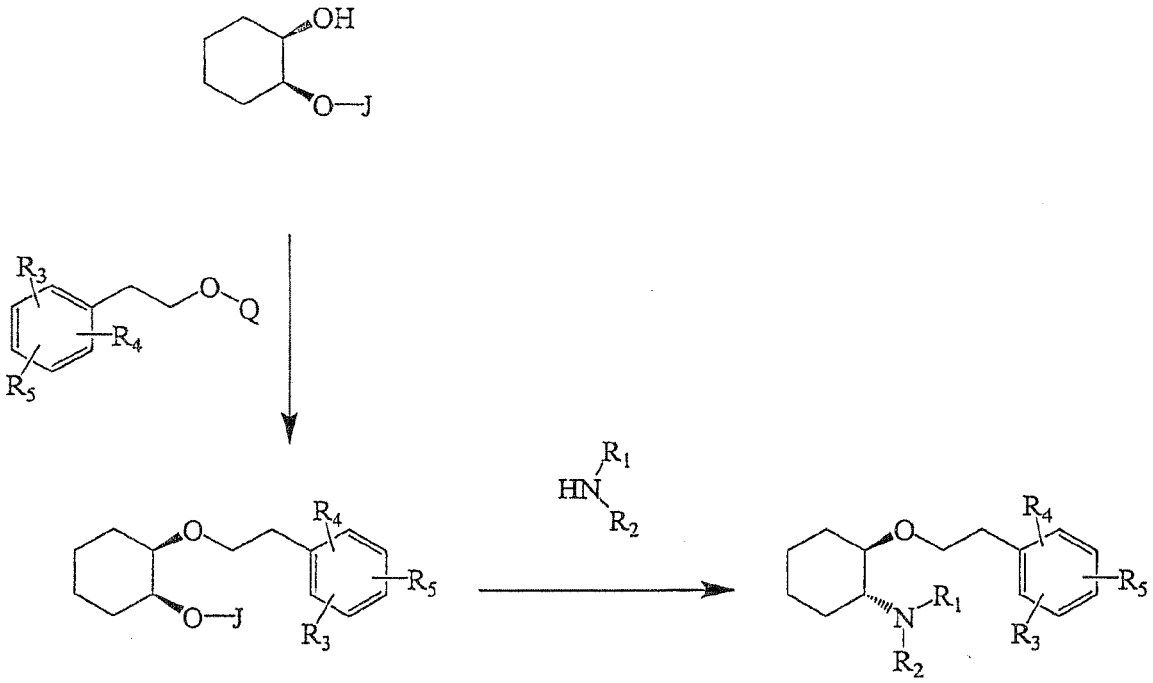


Figure 26

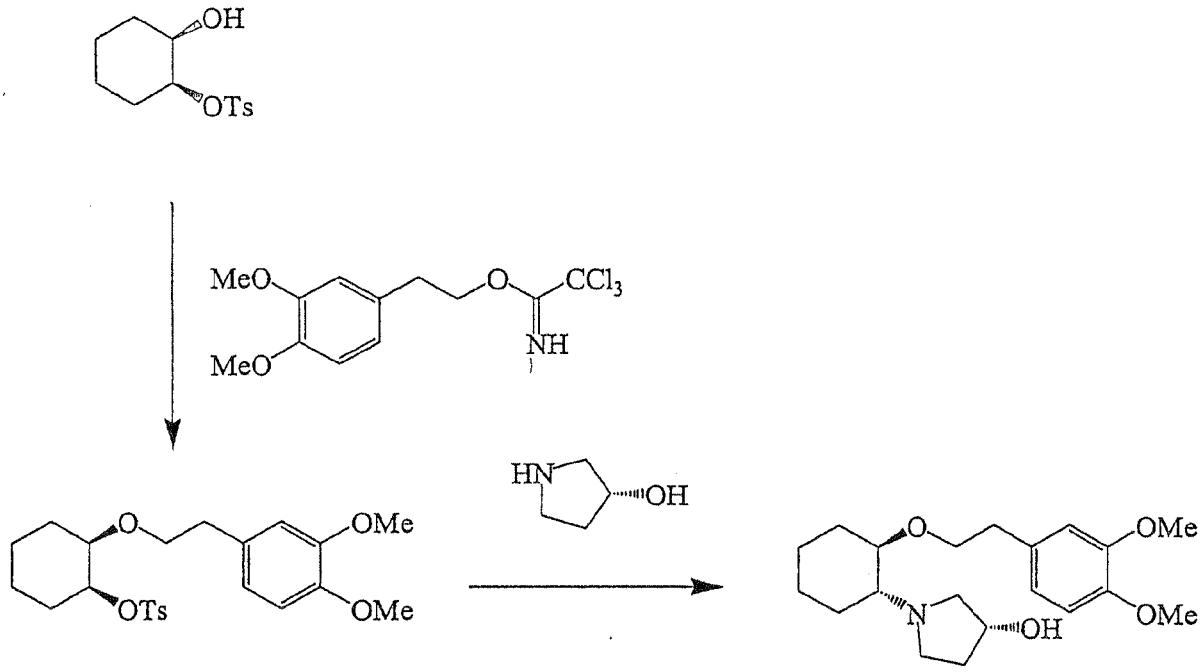


Figure 27

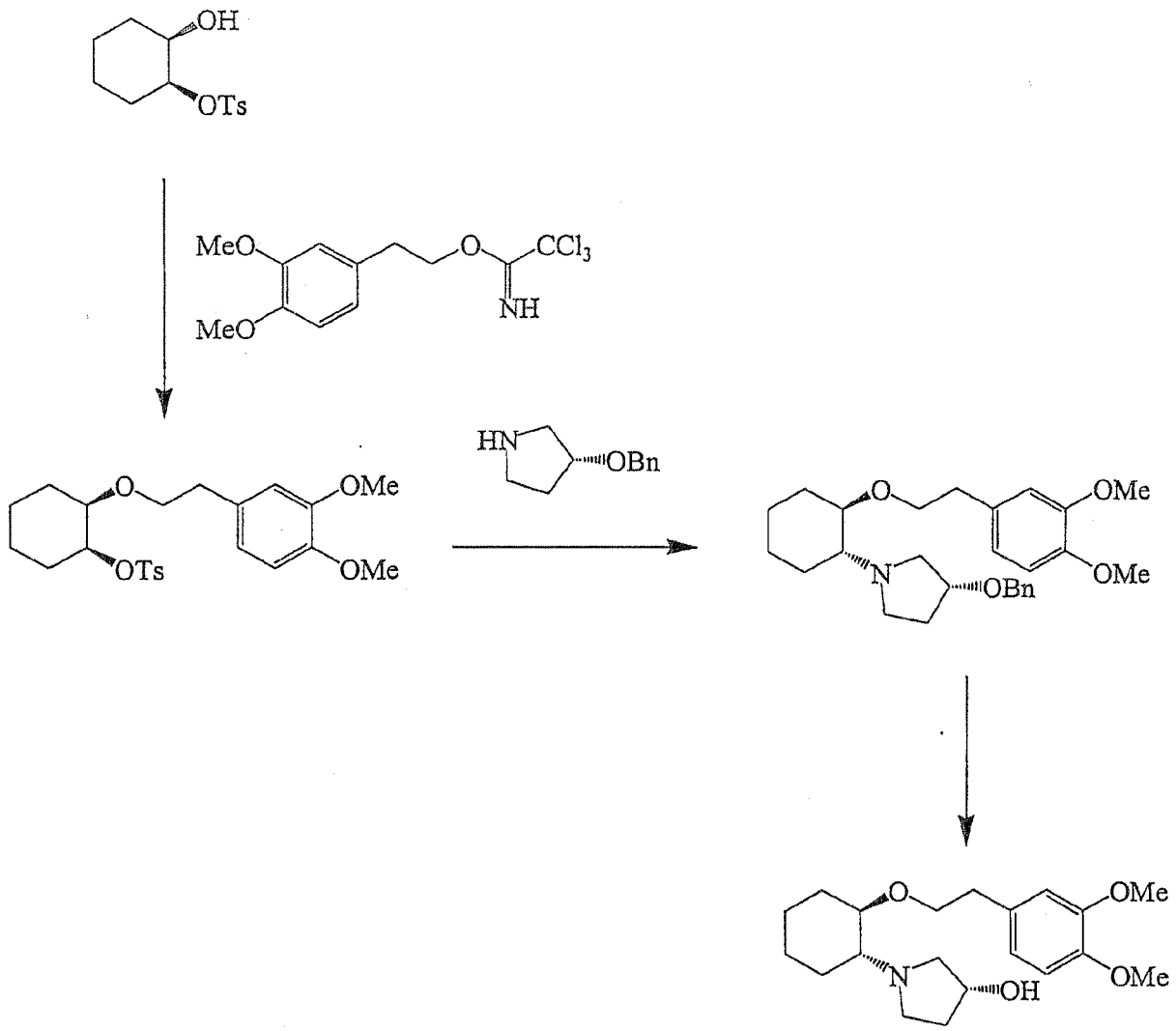

OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 28

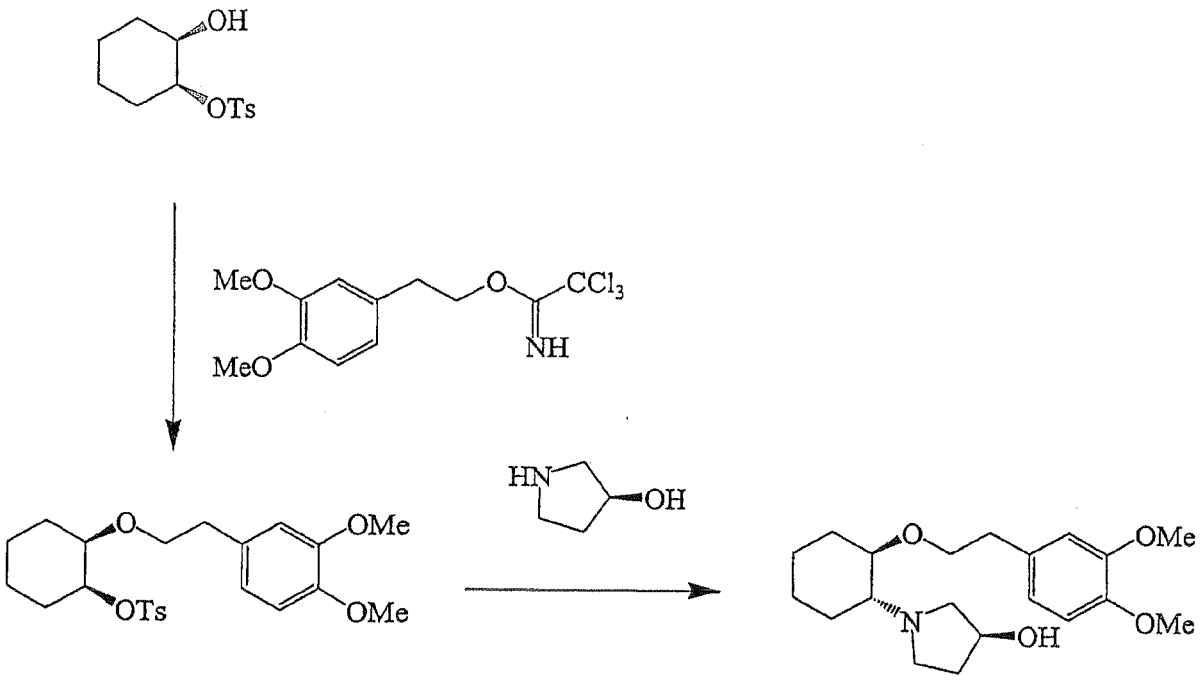


Figure 29

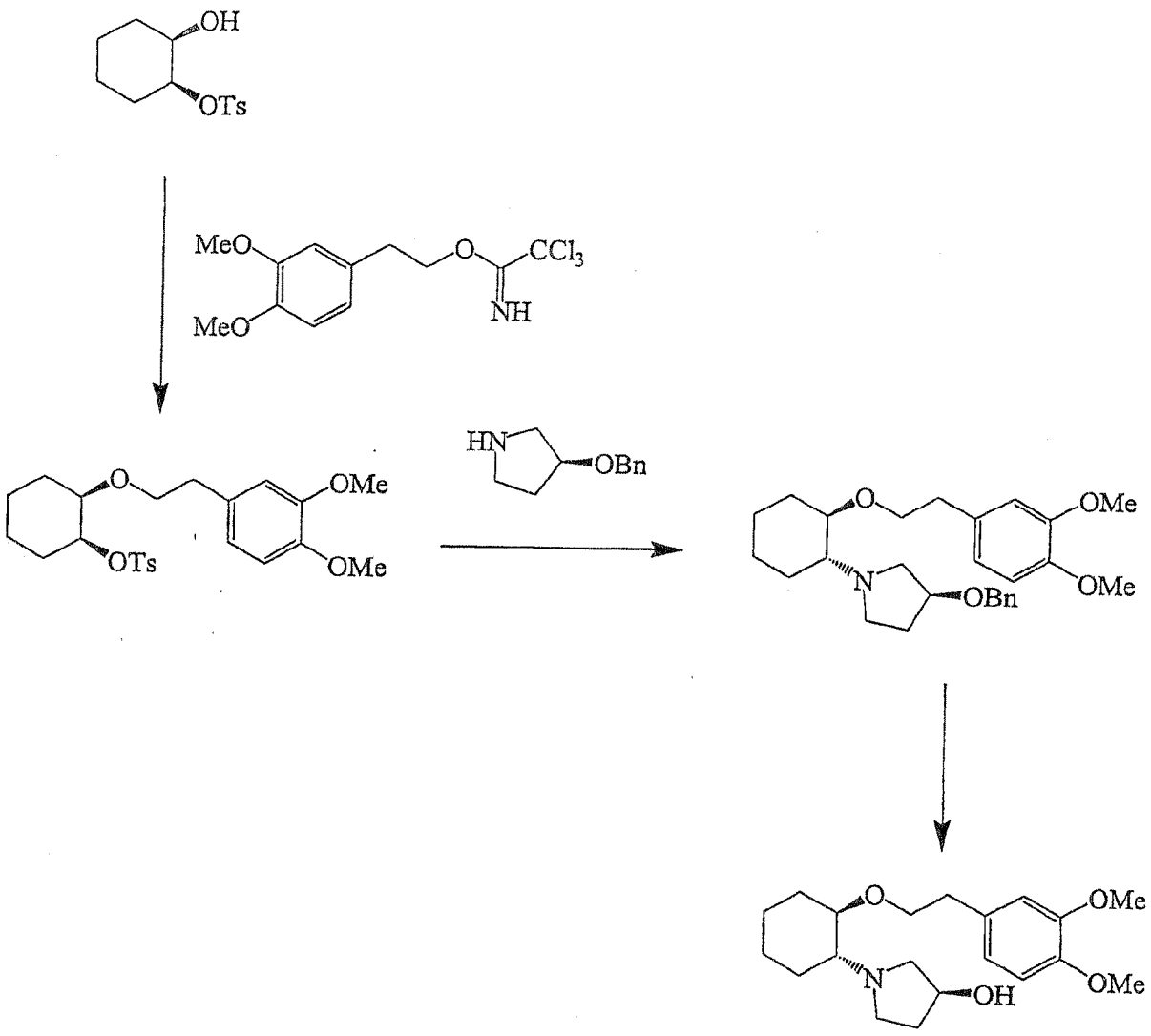

OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
O
N
OBn
OMe
OMe
O
N
OH
OMe
OMe

Figure 30

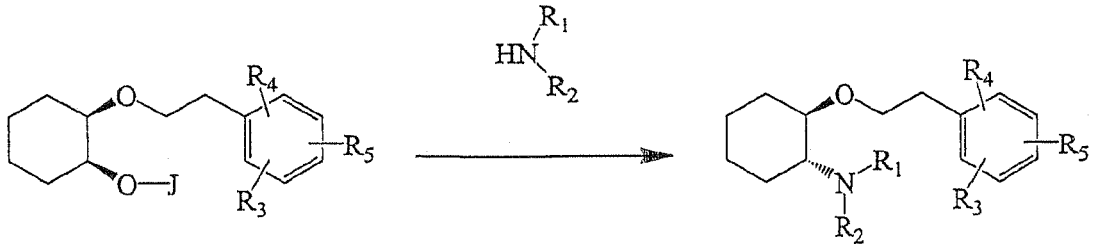


Figure 31

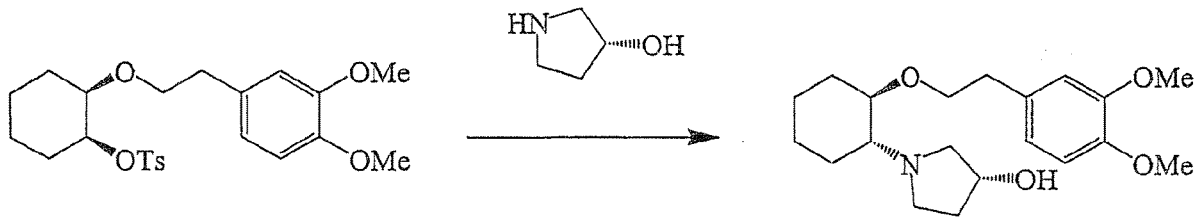


Figure 32

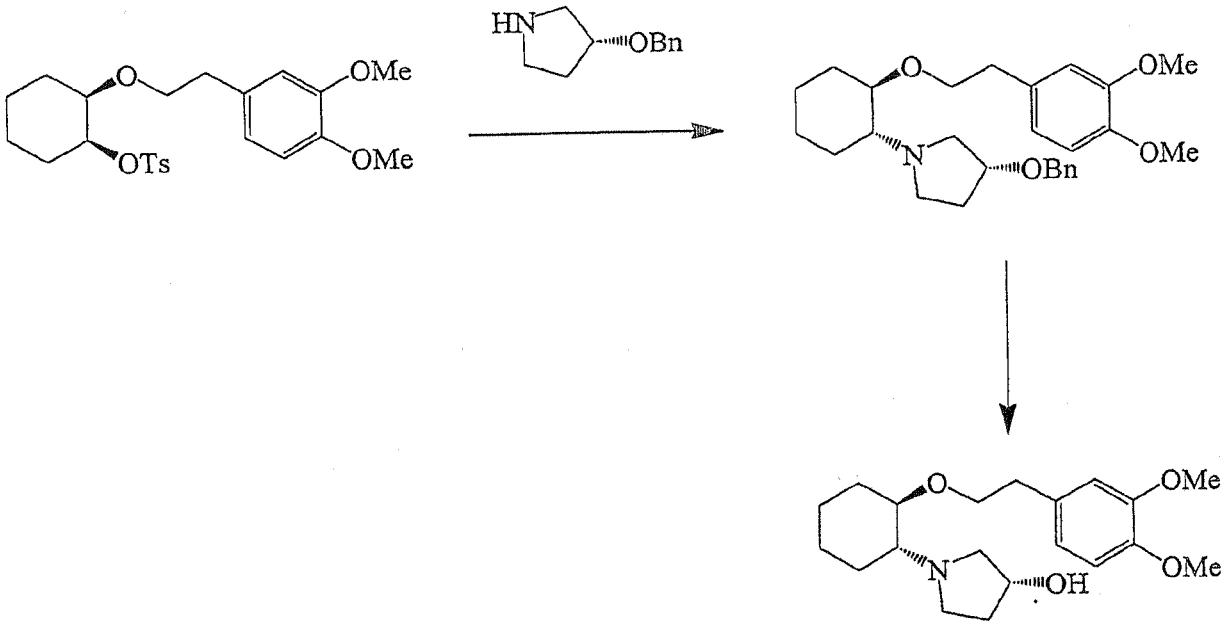


Figure 33

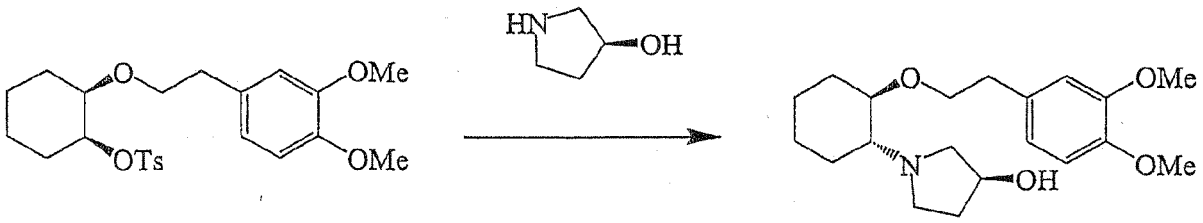


Figure 34

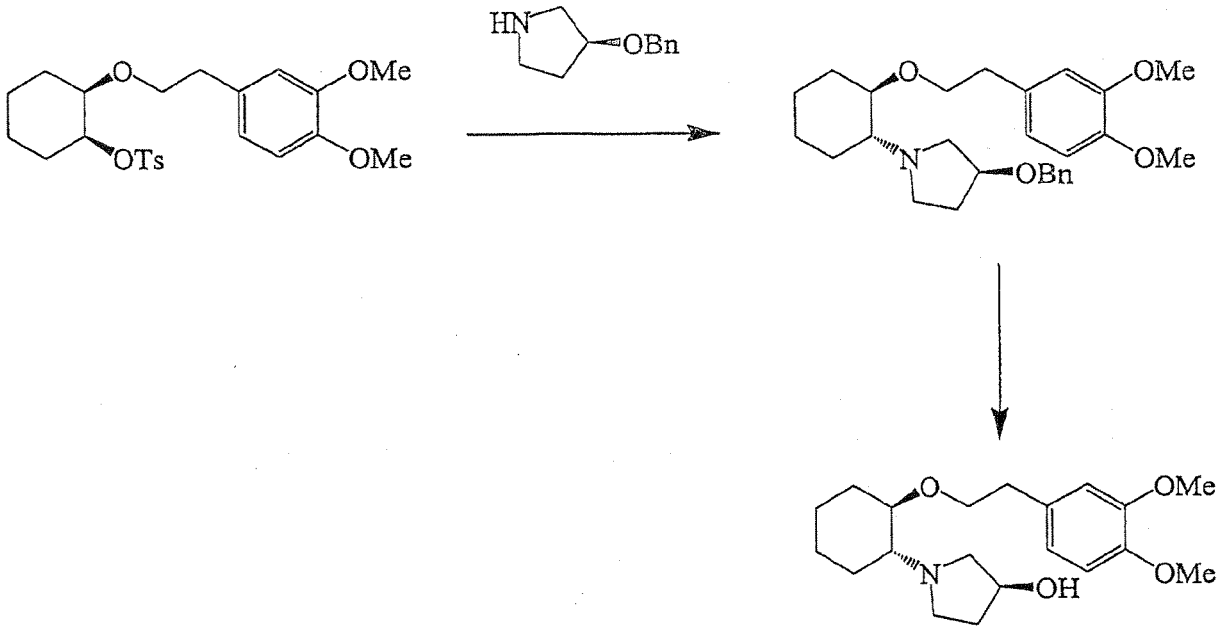


Figure 35

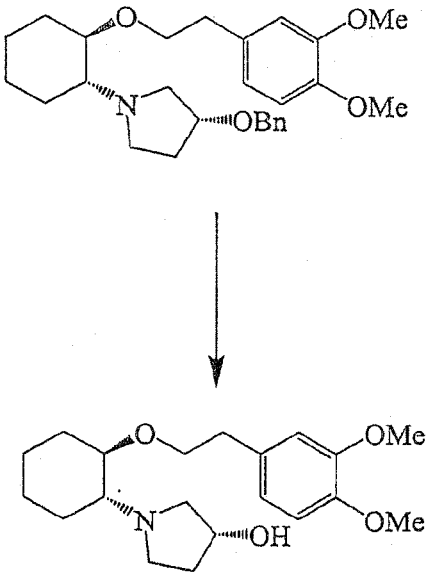


Figure 36

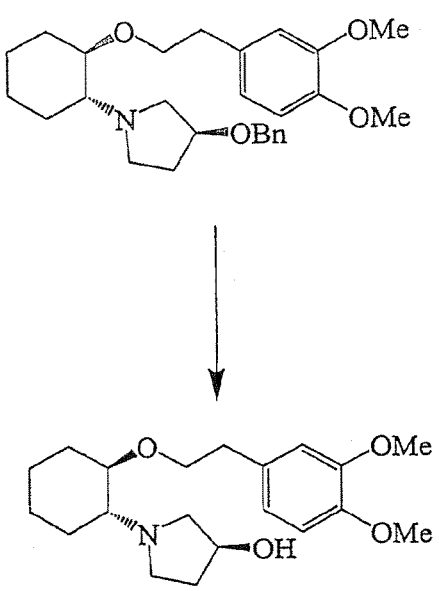


Figure 37

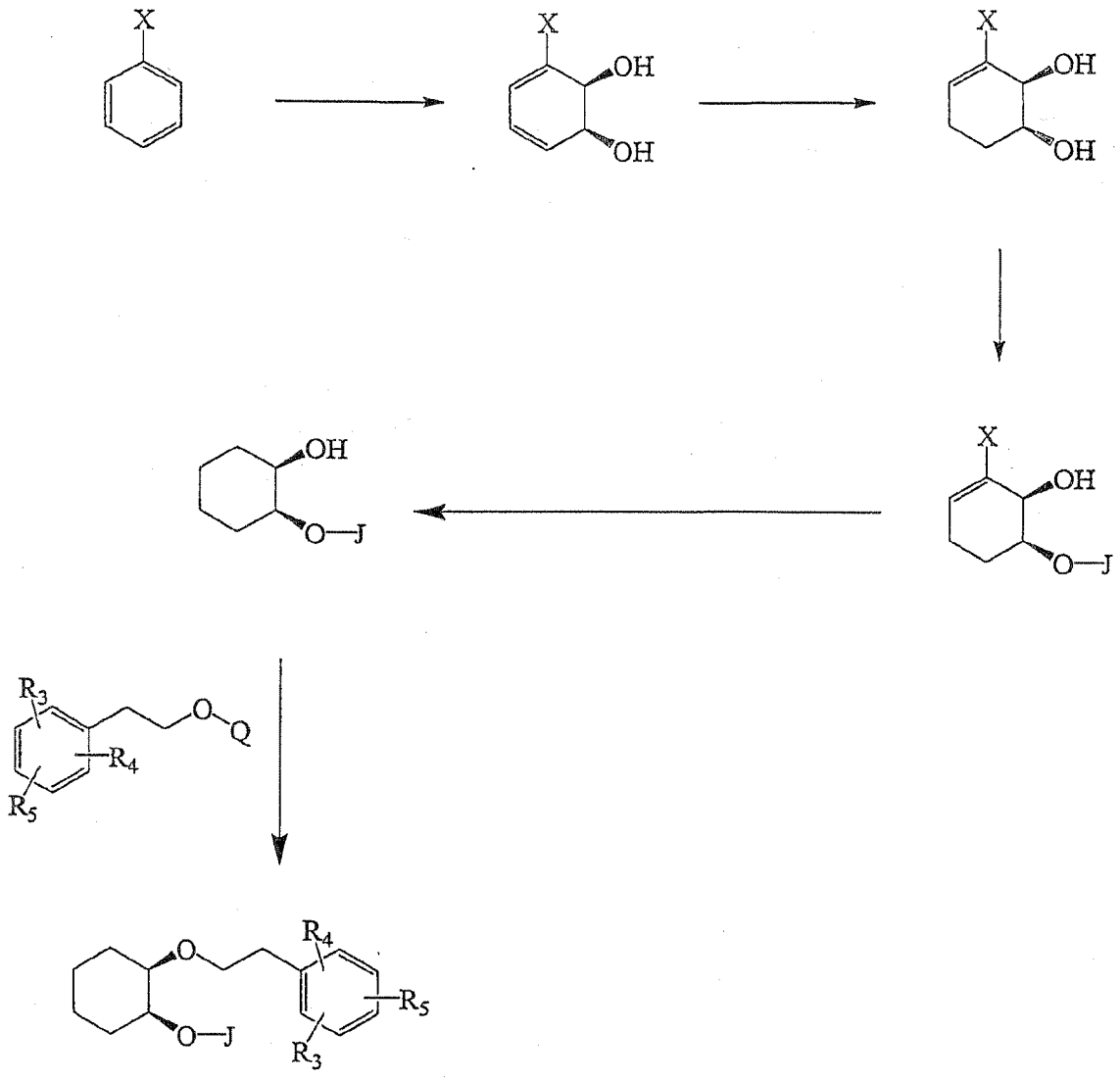


Figure 38

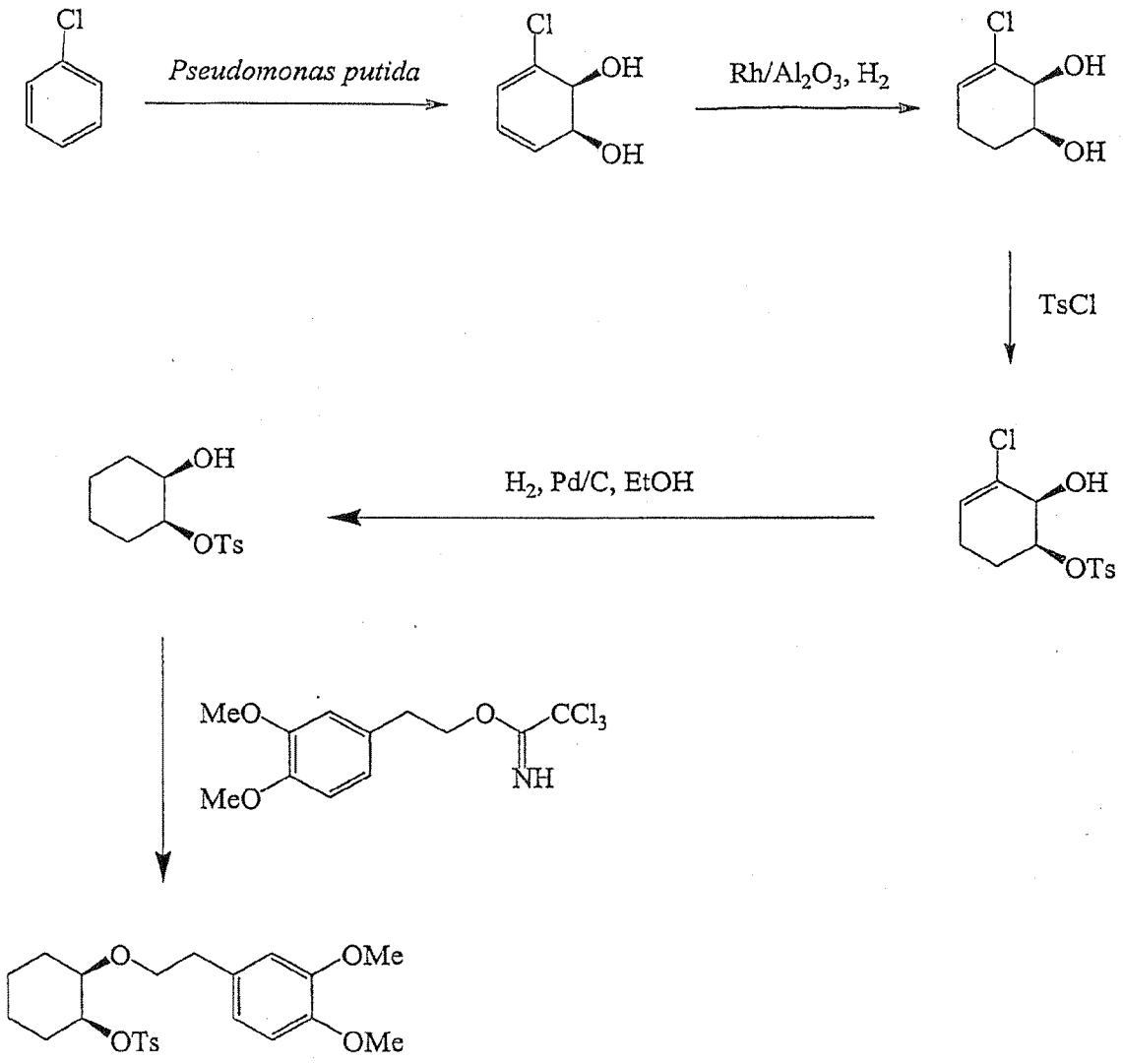

Cl
Pseudomonas putida
Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
O
OTs
OMe
OMe

Figure 39

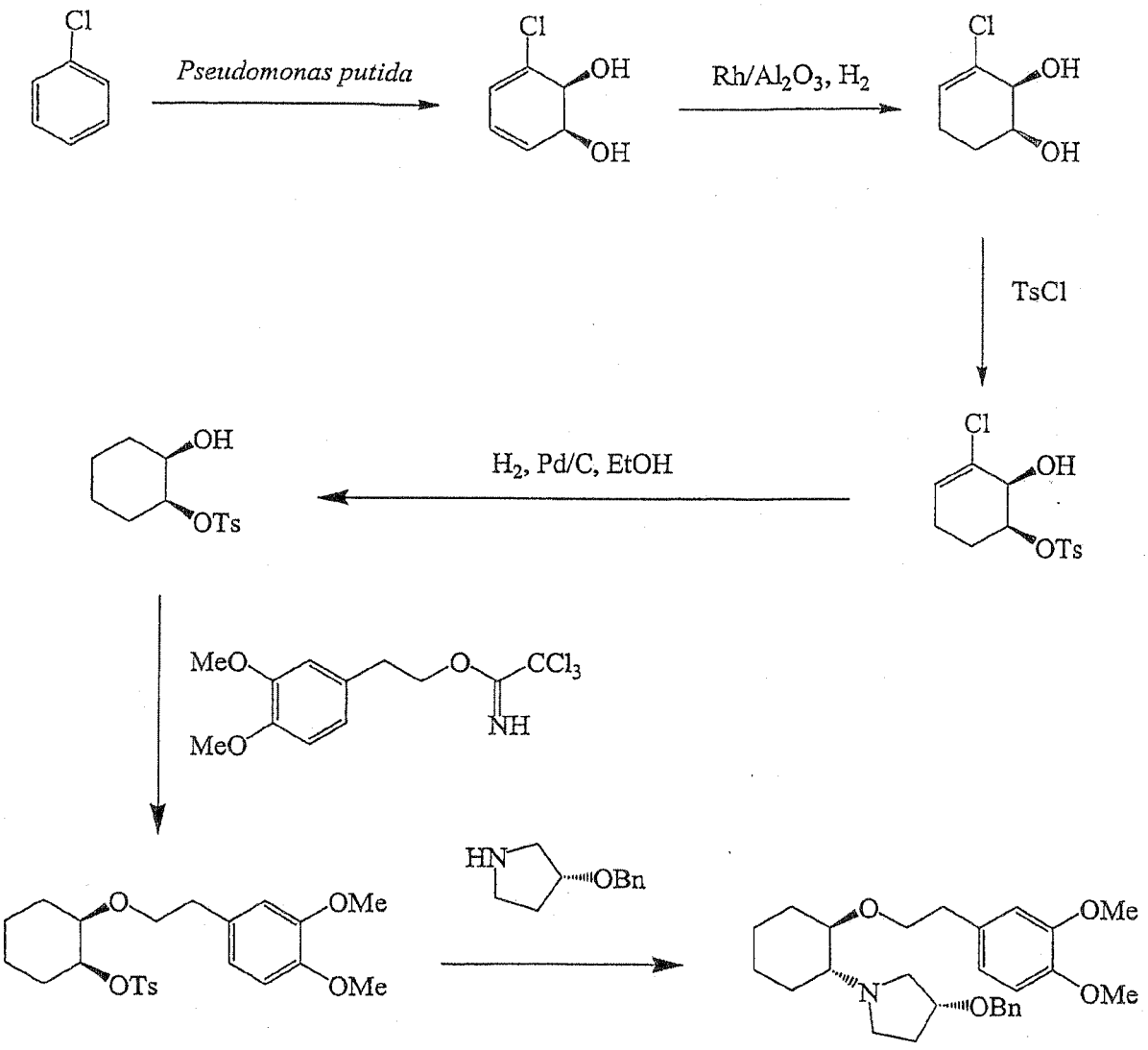

Cl
Pseudomonas putida
Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OTs
OMe
OMe
N
OBn
OMe
OMe

Figure 40

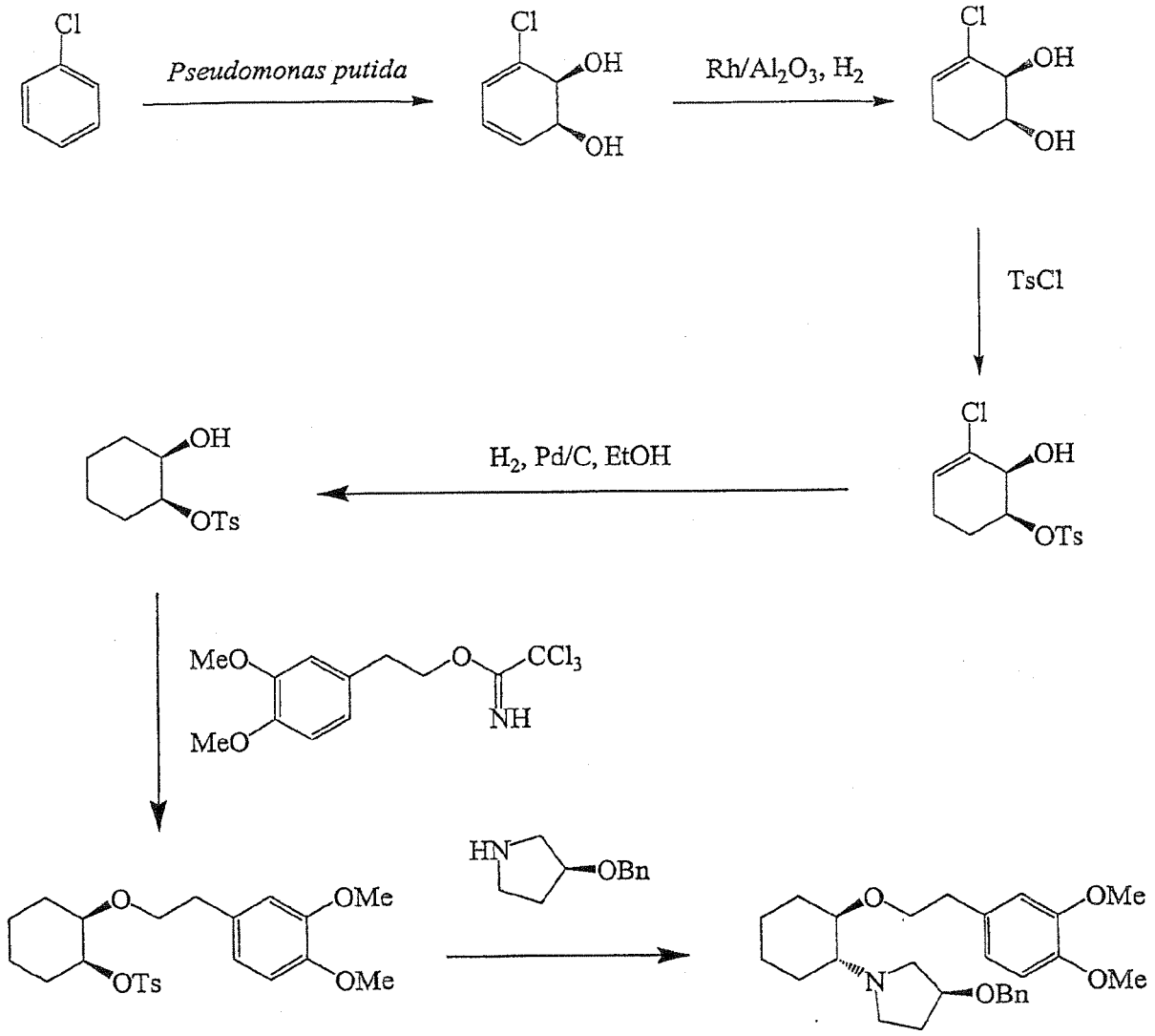

Cl
Pseudomonas putida
Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OBn
O
OMe
OTs
OMe
O
OMe
N
OBn
OMe

Figure 41

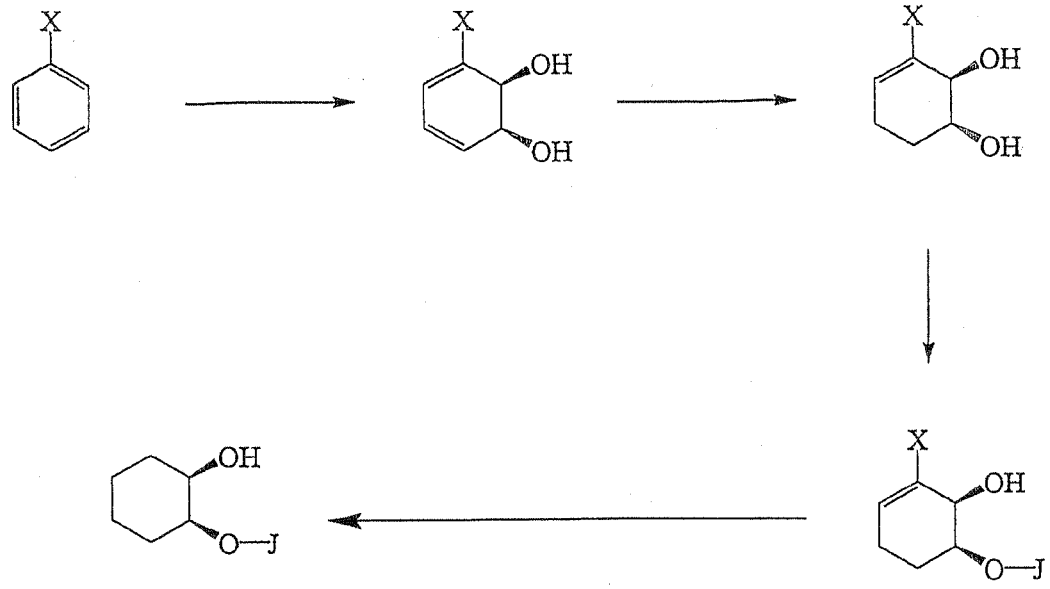


Figure 42

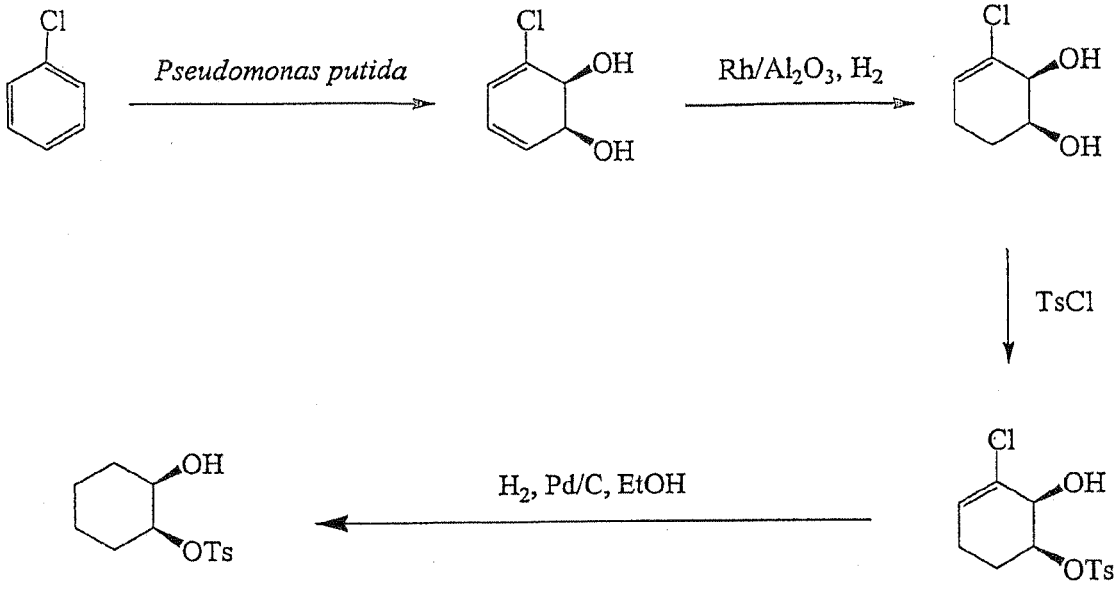

Cl
Pseudomonas putida
Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs
H2, Pd/C, EtOH
OH
OTs

Figure 43

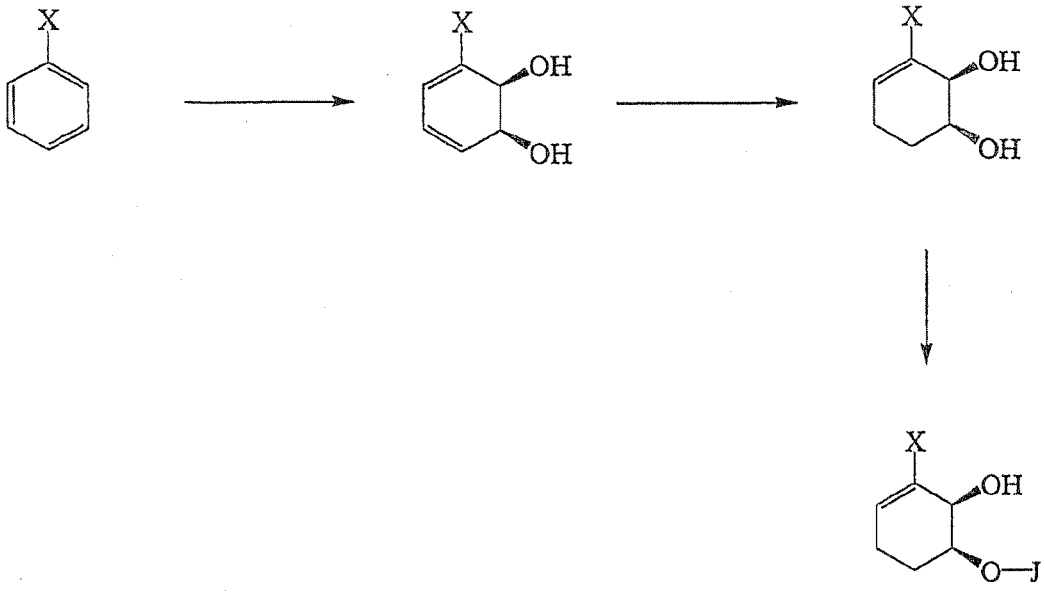


Figure 44

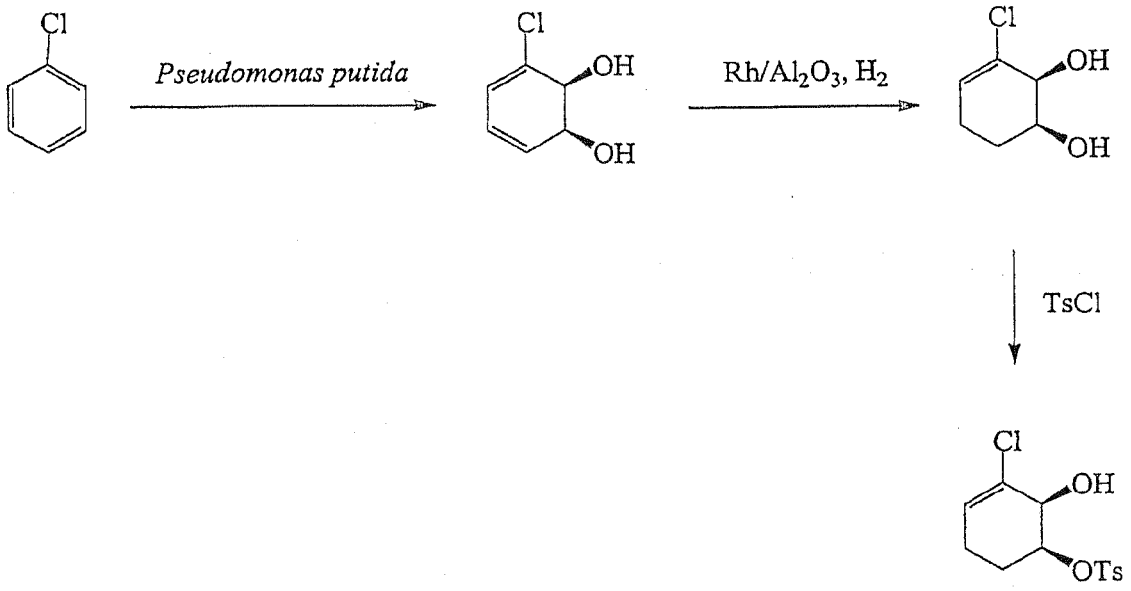

Cl
Pseudomonas putida
Cl
OH
OH
Rh/Al2O3, H2
Cl
OH
OH
TsCl
Cl
OH
OTs

Figure 45

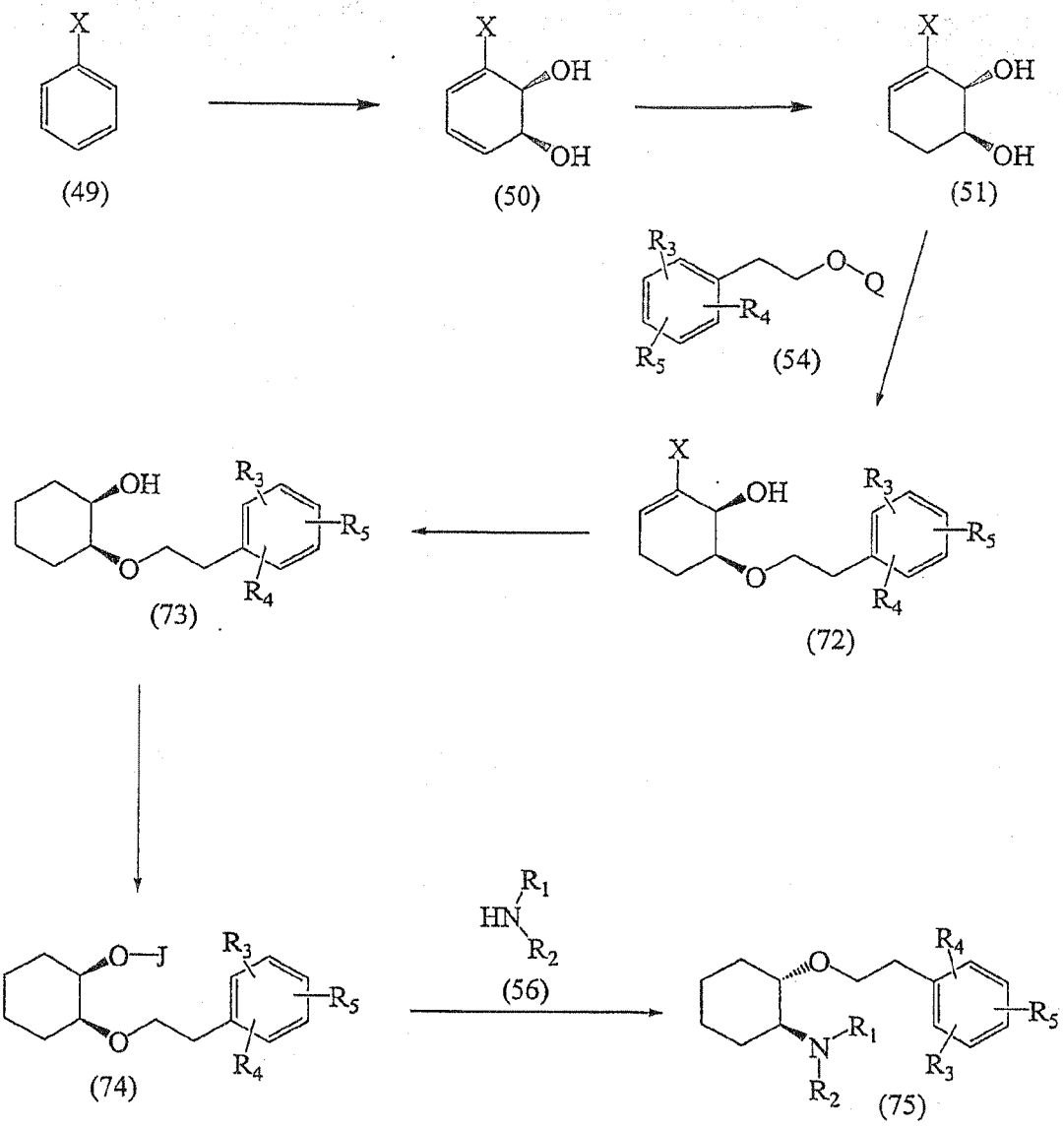


Figure 46

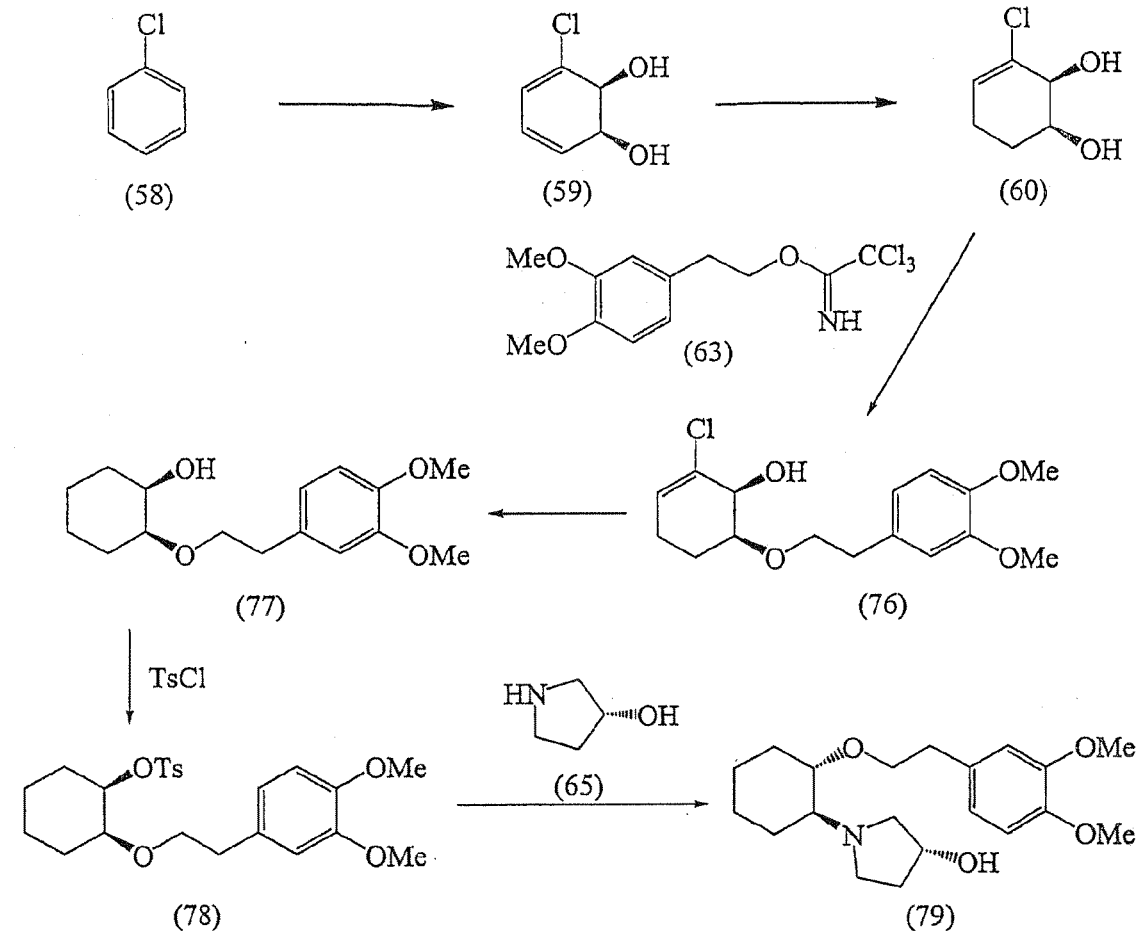

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OH
(60)
MeO
MeO
O
CCl3
NH
(63)
Cl
OH
O
OMe
OMe
(76)
OH
O
OMe
OMe
(77)
TsCl
OTs
O
OMe
OMe
(78)
HN
OH
(65)
O
N
OH
OMe
OMe
(79)

Figure 47

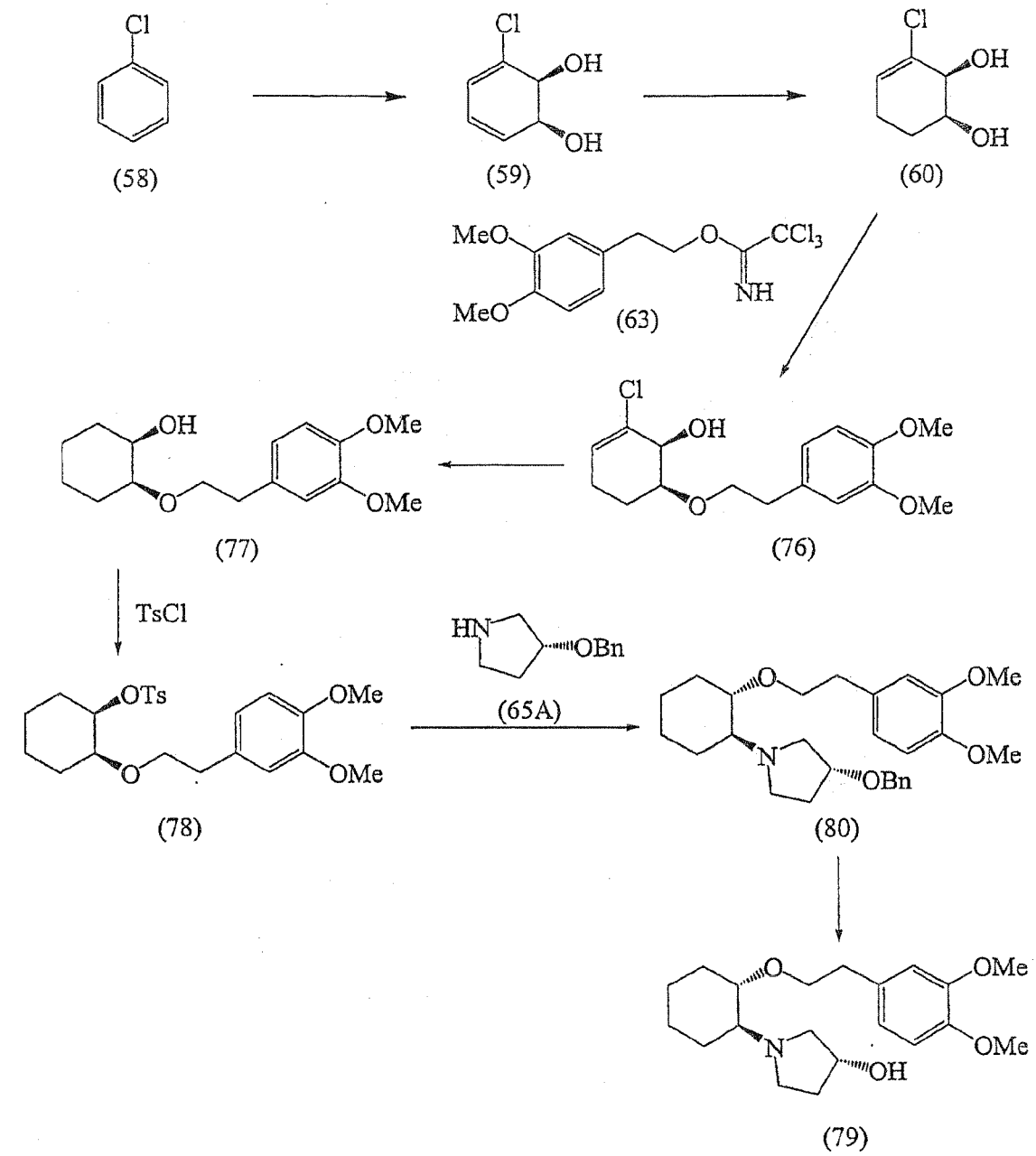

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OH
(60)
MeO
MeO
O
CCl3
NH
(63)
Cl
OH
OMe
OMe
O
(76)
OH
OMe
OMe
O
(77)
TsCl
OTs
OMe
OMe
O
(78)
HN
OBn
(65A)
O
OMe
OMe
N
OBn
(80)
O
OMe
OMe
N
OH
(79)

Figure 48

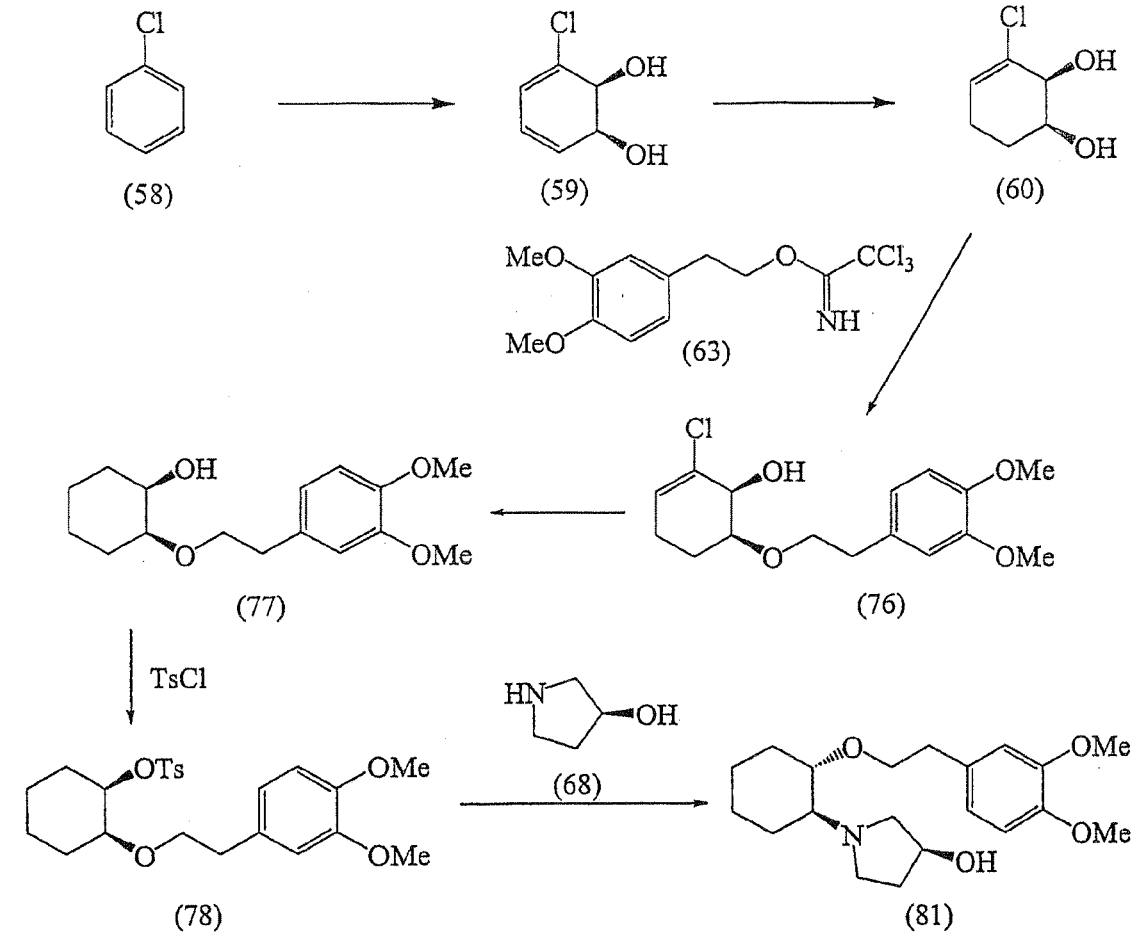

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OH
(60)
MeO
MeO
O
CCl3
NH
(63)
Cl
OH
O
OMe
OMe
(76)
OH
O
OMe
OMe
(77)
TsCl
OTs
O
OMe
OMe
(78)
HN
OH
(68)
O
N
OH
OMe
OMe
(81)

Figure 49

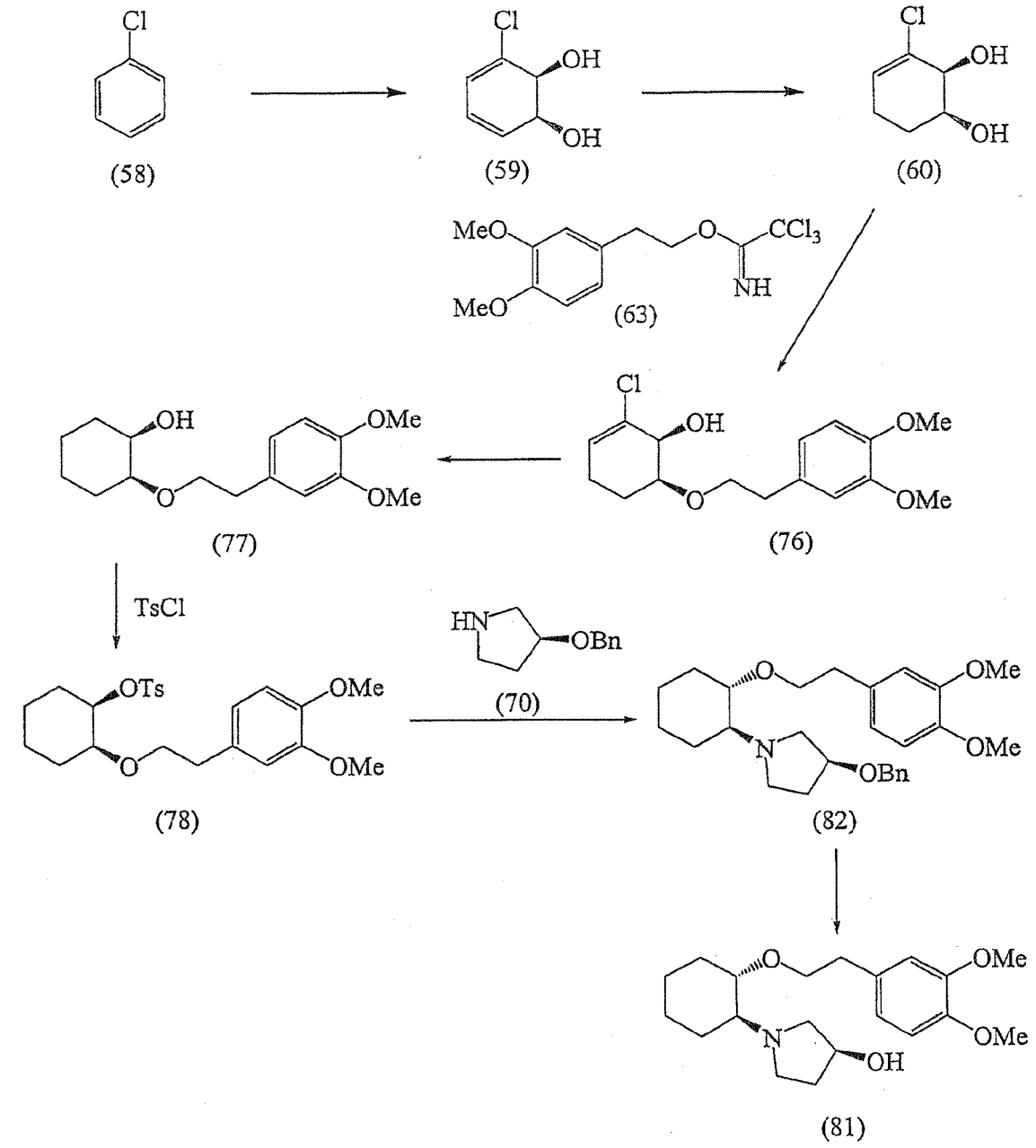

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OH
(60)
MeO
MeO
O
CCl3
NH
(63)
Cl
OH
O
OMe
OMe
(76)
OH
O
OMe
OMe
(77)
TsCl
OTs
O
OMe
OMe
(78)
HN
OBn
(70)
O
N
OBn
OMe
OMe
(82)
O
N
OH
OMe
OMe
(81)

Figure 50

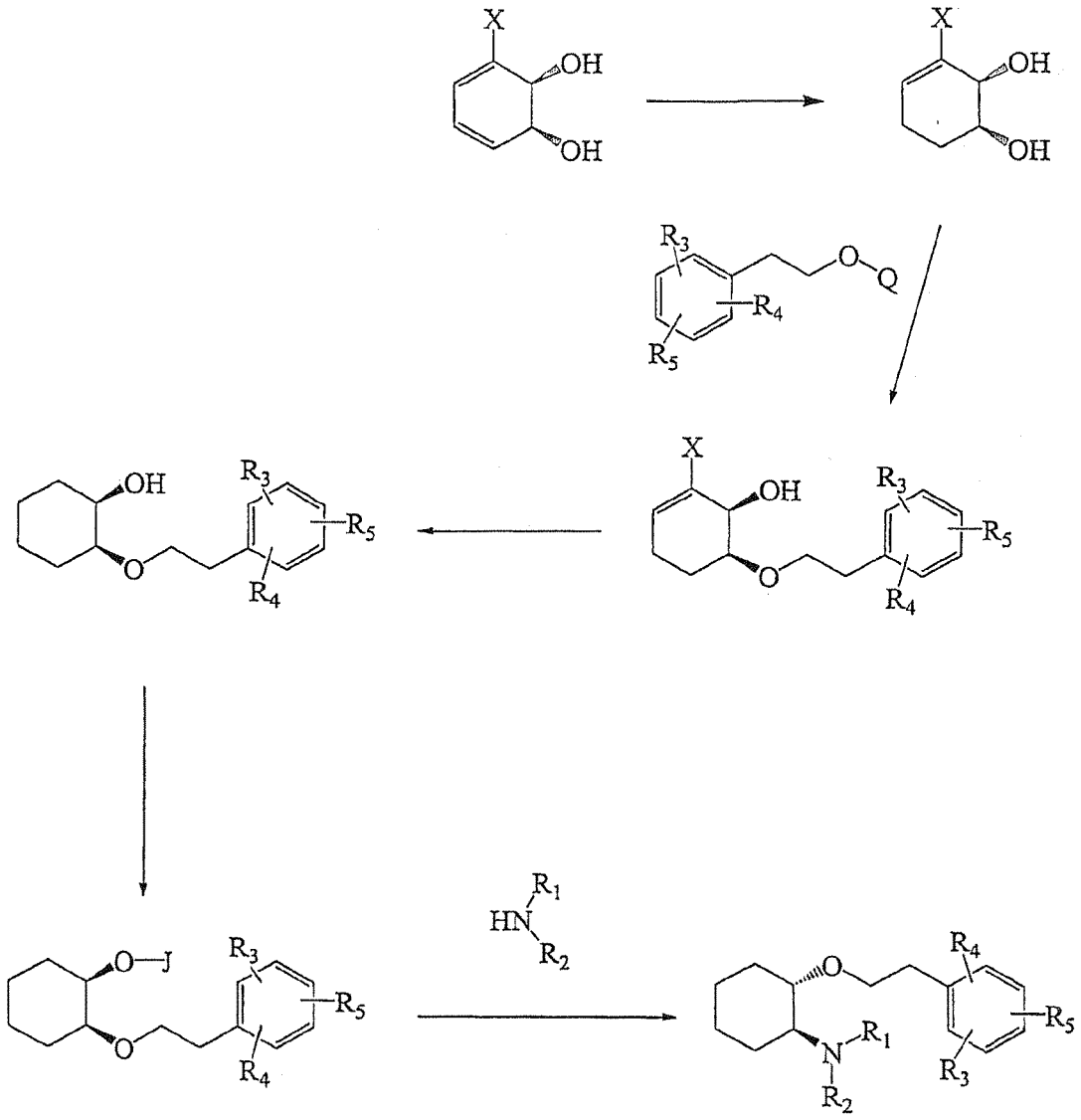

X
OH
OH
X
OH
OH
R3
O
Q
R4
R5
X
OH
R3
R5
O
R4
OH
R3
R5
O
R4
O
J
R3
R5
O
R4
R1
HN
R2
O
R4
R5
N
R1
R2
R3

Figure 51

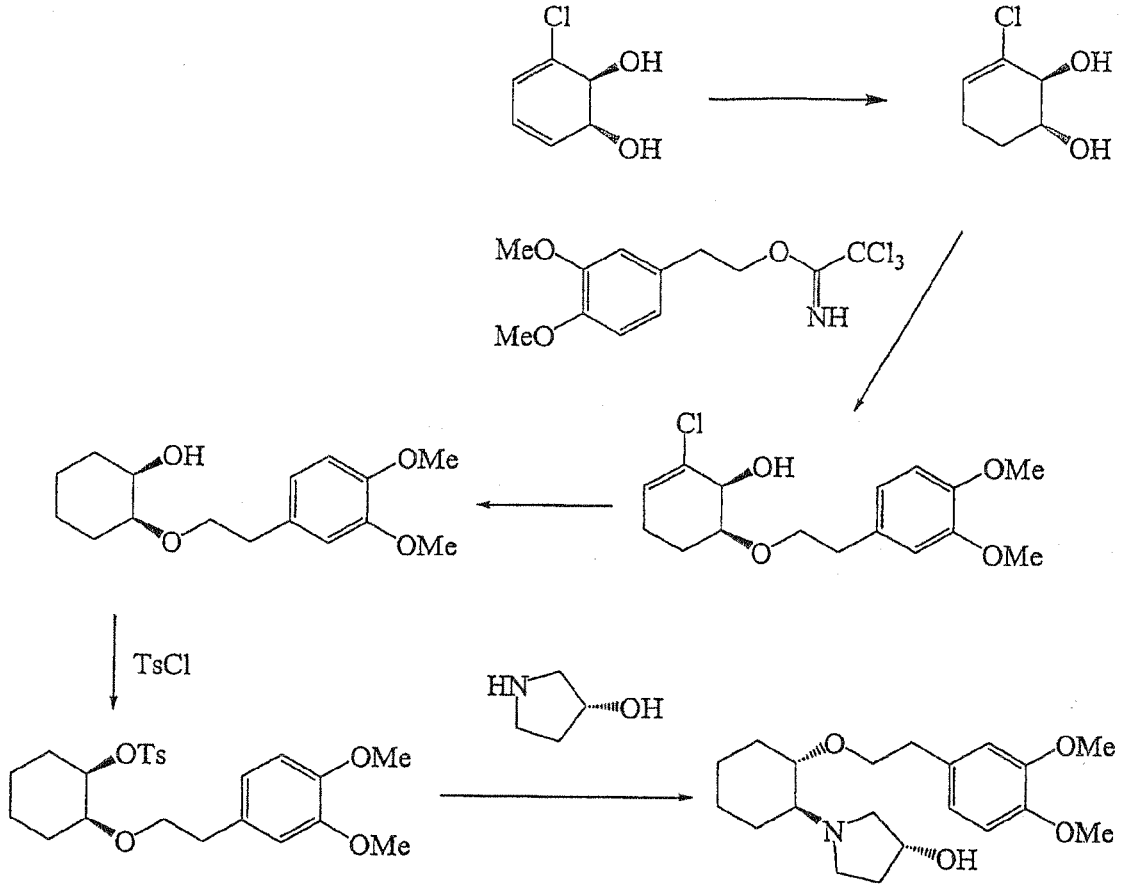

Cl
OH
OH
Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
OTs
OMe
OMe
O
HN
OH
O
OMe
OMe
N
OH

Figure 52

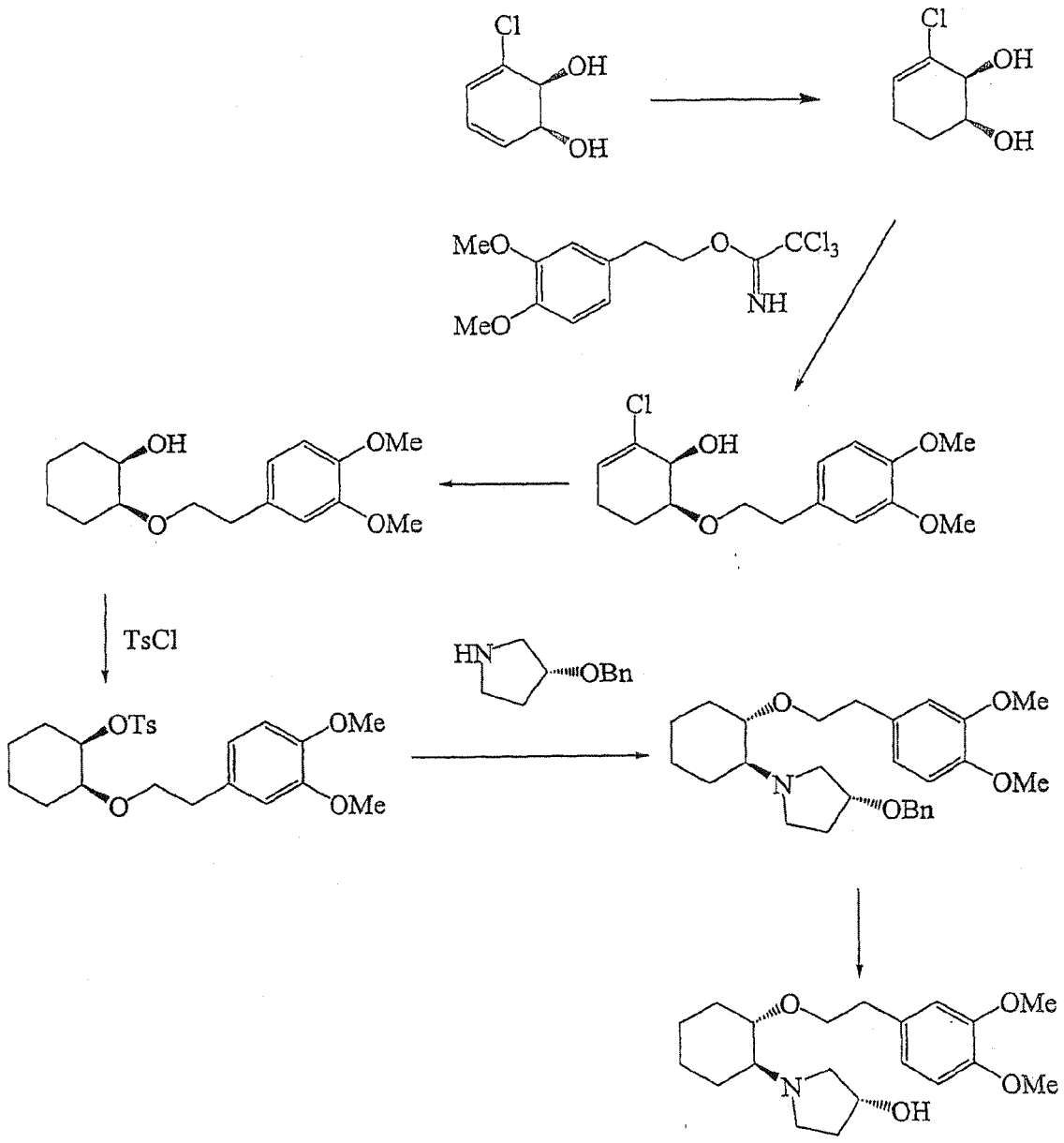

Cl
OH
OH
Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
HN
OBn
OTs
OMe
OMe
O
O
OMe
OMe
N
OBn
O
OMe
OMe
N
OH

Figure 53

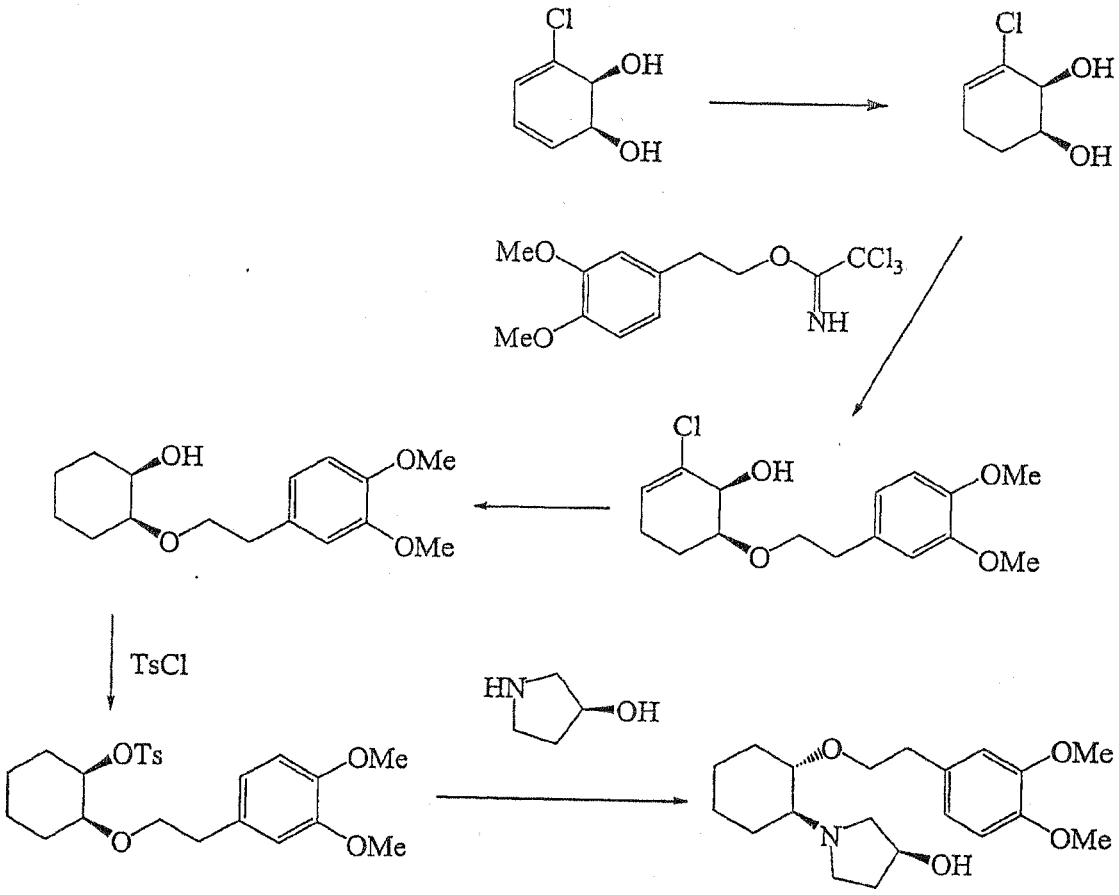

Cl
OH
OH
Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
OTs
OMe
OMe
HN
OH
O
OMe
OMe
N
OH

Figure 54

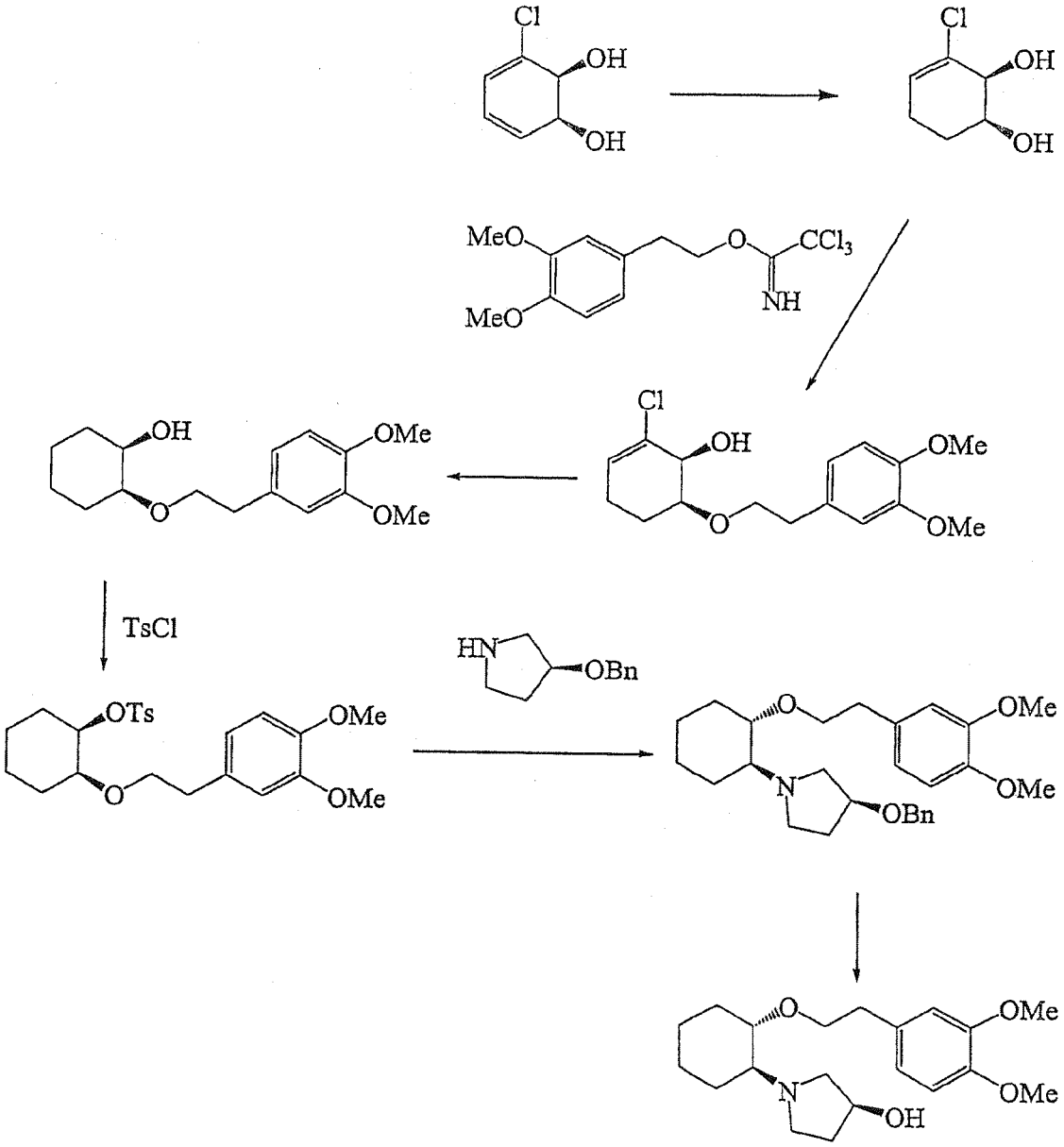

Cl
OH
OH
Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
OTs
OMe
OMe
O
HN
OBn
O
OMe
OMe
N
OBn
O
OMe
OMe
N
OH

Figure 55

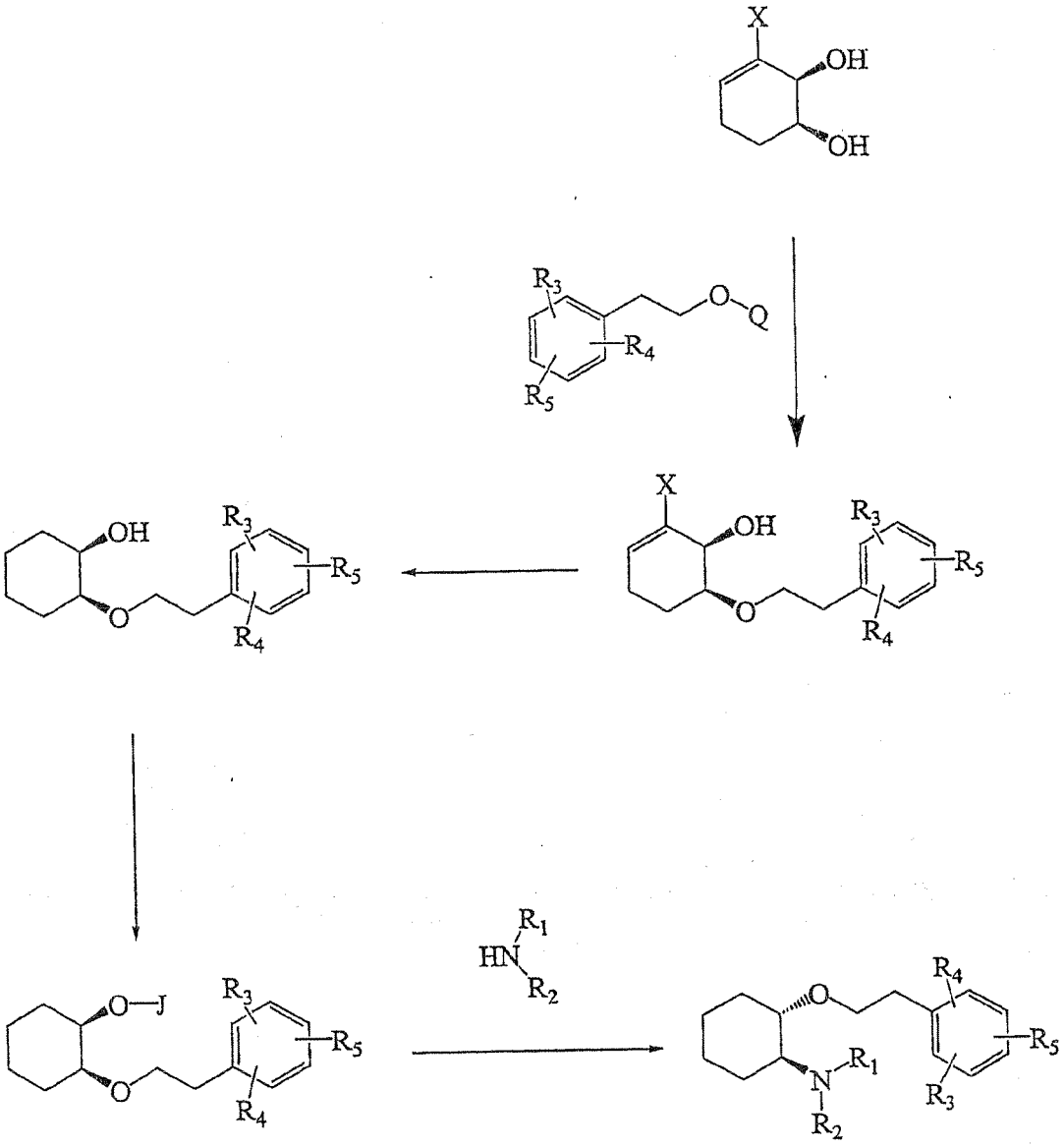

X
OH
OH
R3
O
Q
R4
R5
X
OH
R3
R5
O
R4
OH
R3
R5
O
R4
O
J
R3
R5
O
R4
R1
HN
R2
R4
O
R5
R1
N
R2
R3

Figure 56

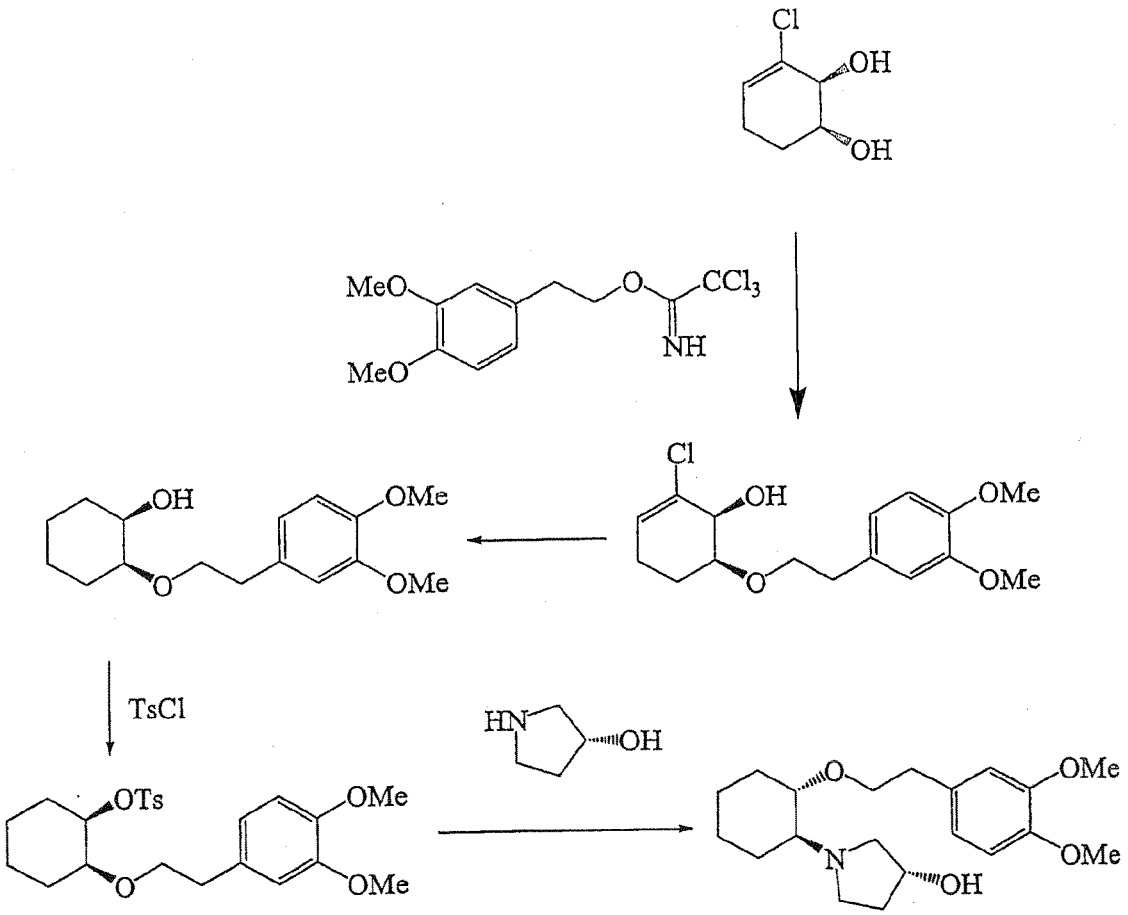

Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
OTs
OMe
OMe
O
HN
OH
O
OMe
OMe
N
OH

Figure 57

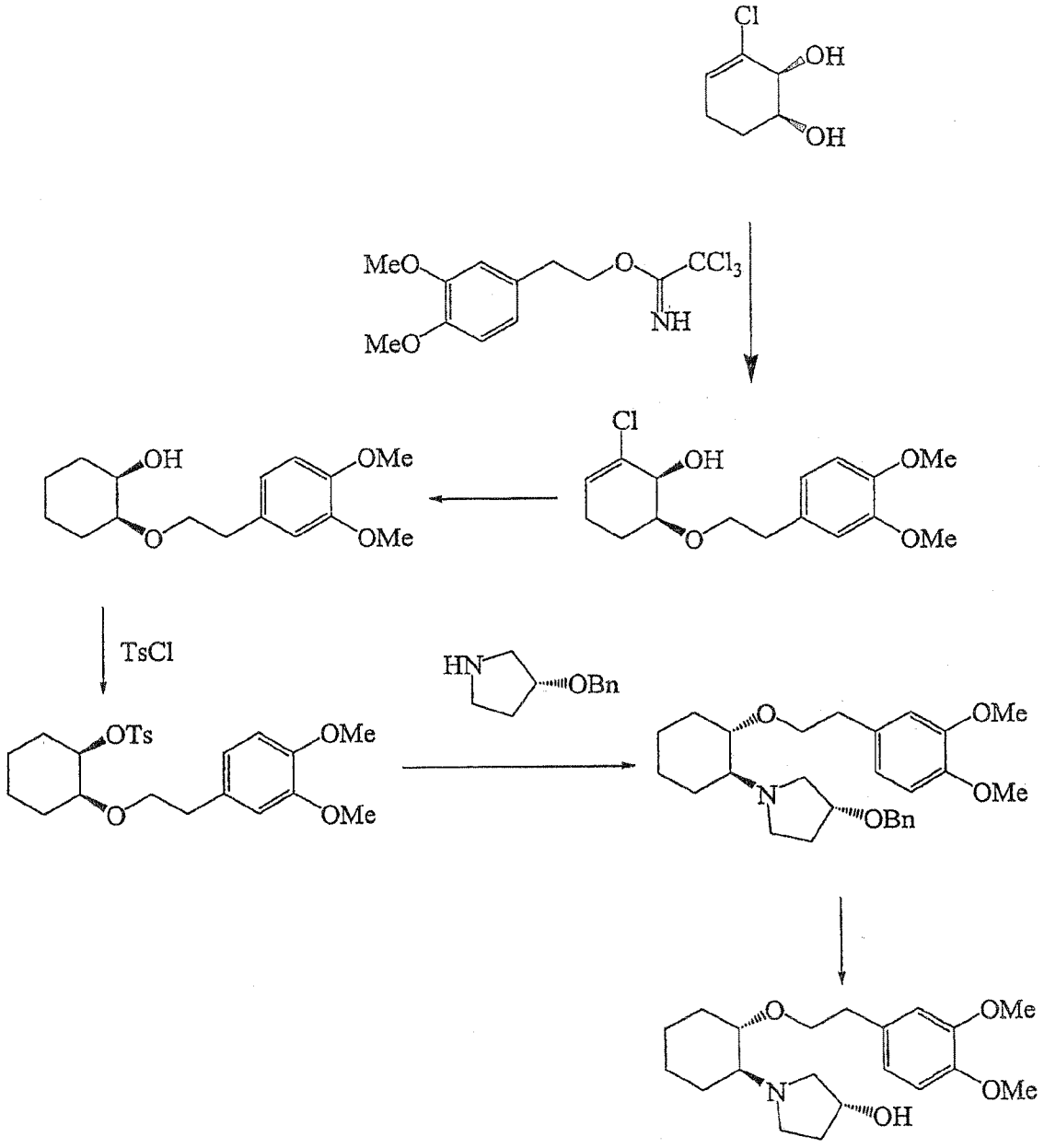

Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
OTs
OMe
OMe
O
HN
OBn
O
OMe
OMe
N
OBn
O
OMe
OMe
N
OH

Figure 58

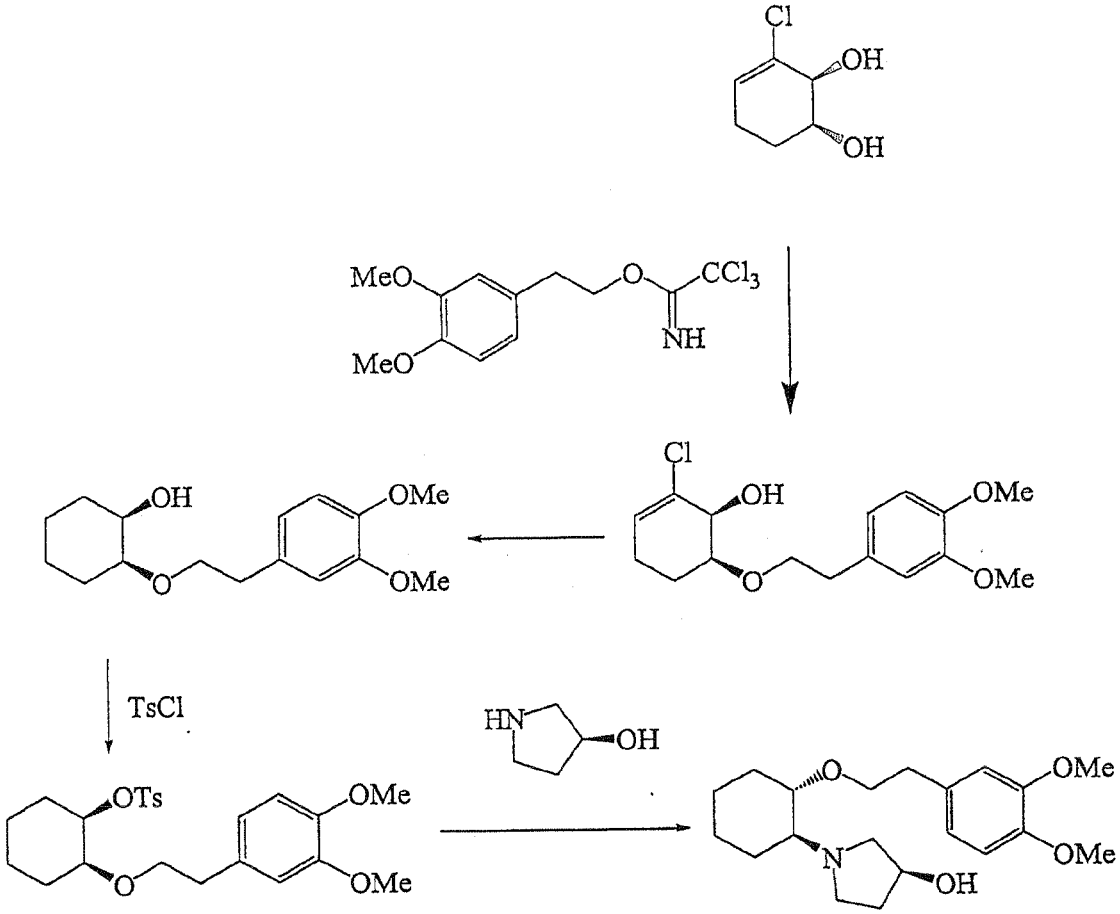

Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
O
OMe
OH
OMe
O
OMe
TsCl
HN
OH
OTs
OMe
O
OMe
O
OMe
N
OH
OMe

Figure 59

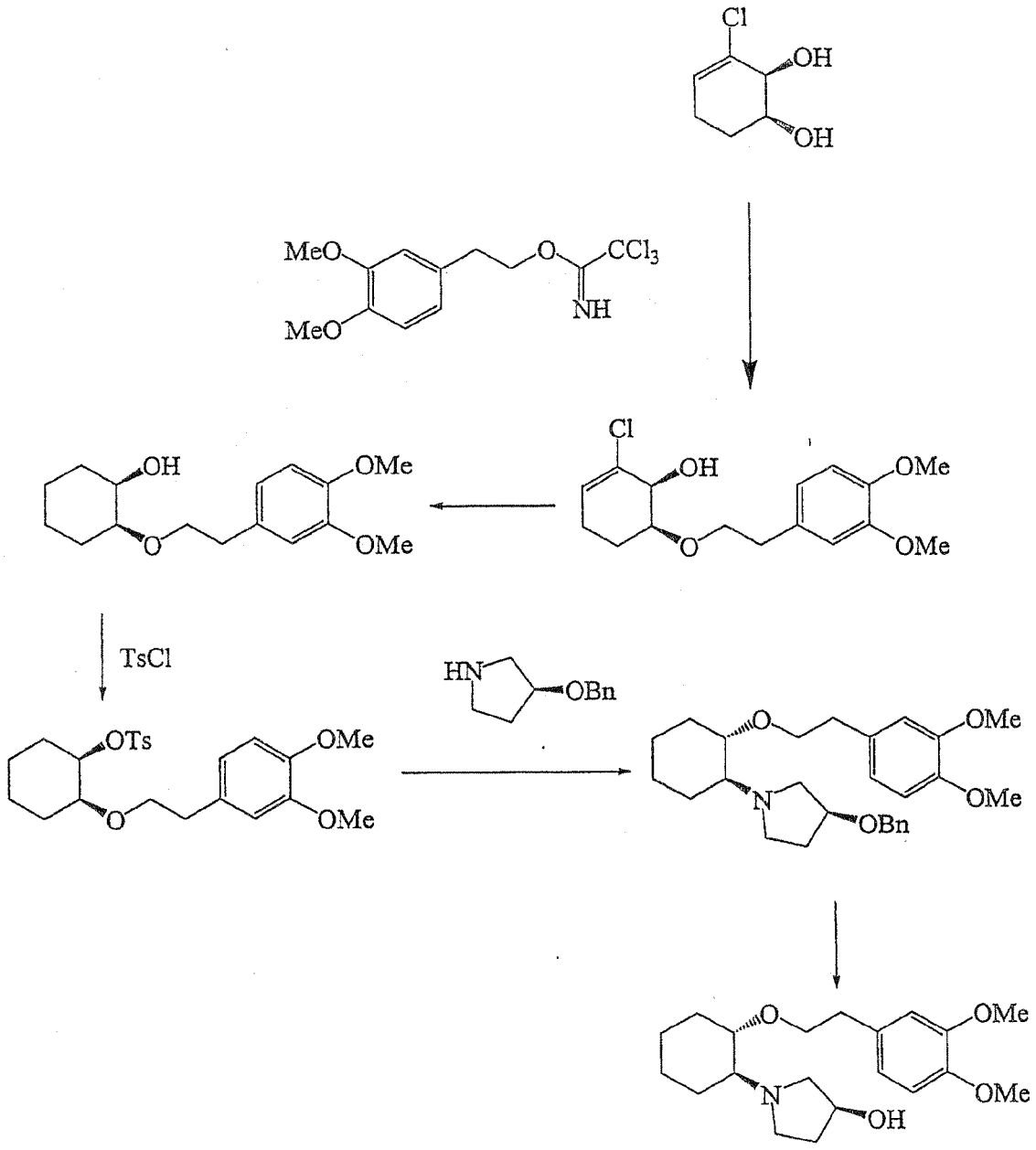

Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
HN
OBn
OTs
OMe
OMe
O
O
OMe
OMe
N
OBn
O
OMe
OMe
N
OH

Figure 60

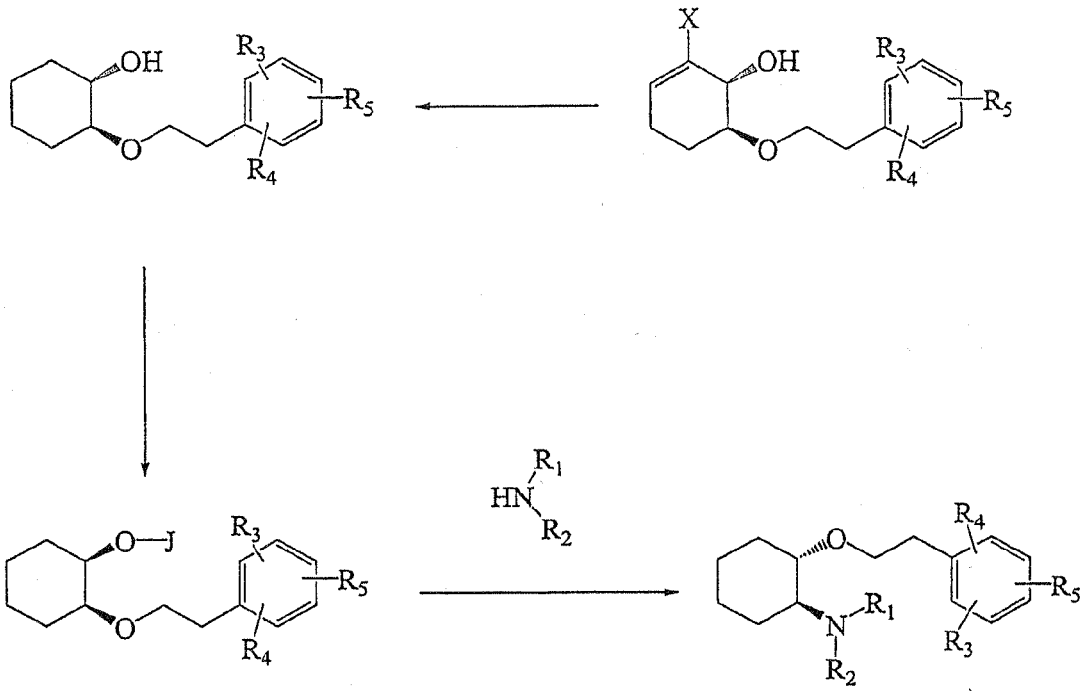


Figure 61

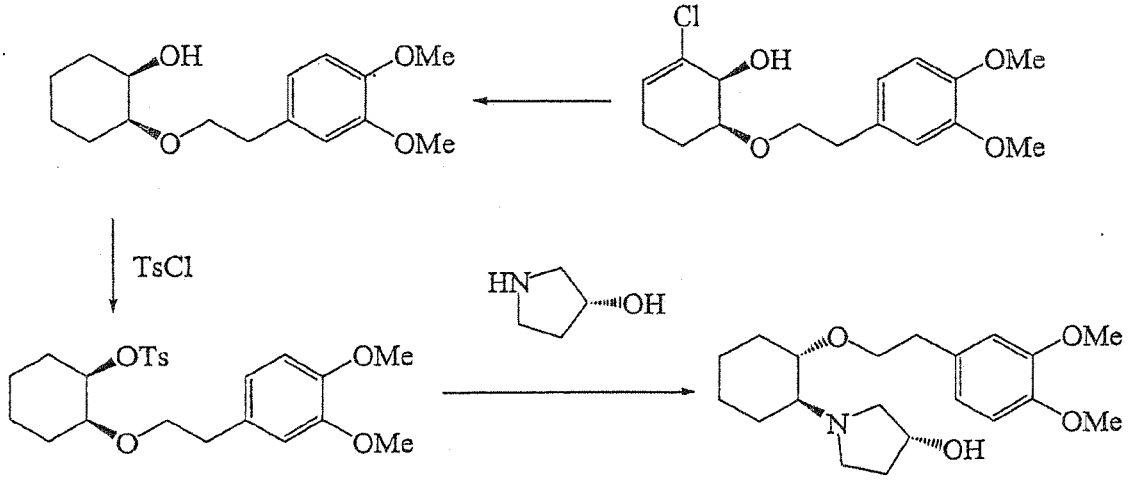


Figure 62

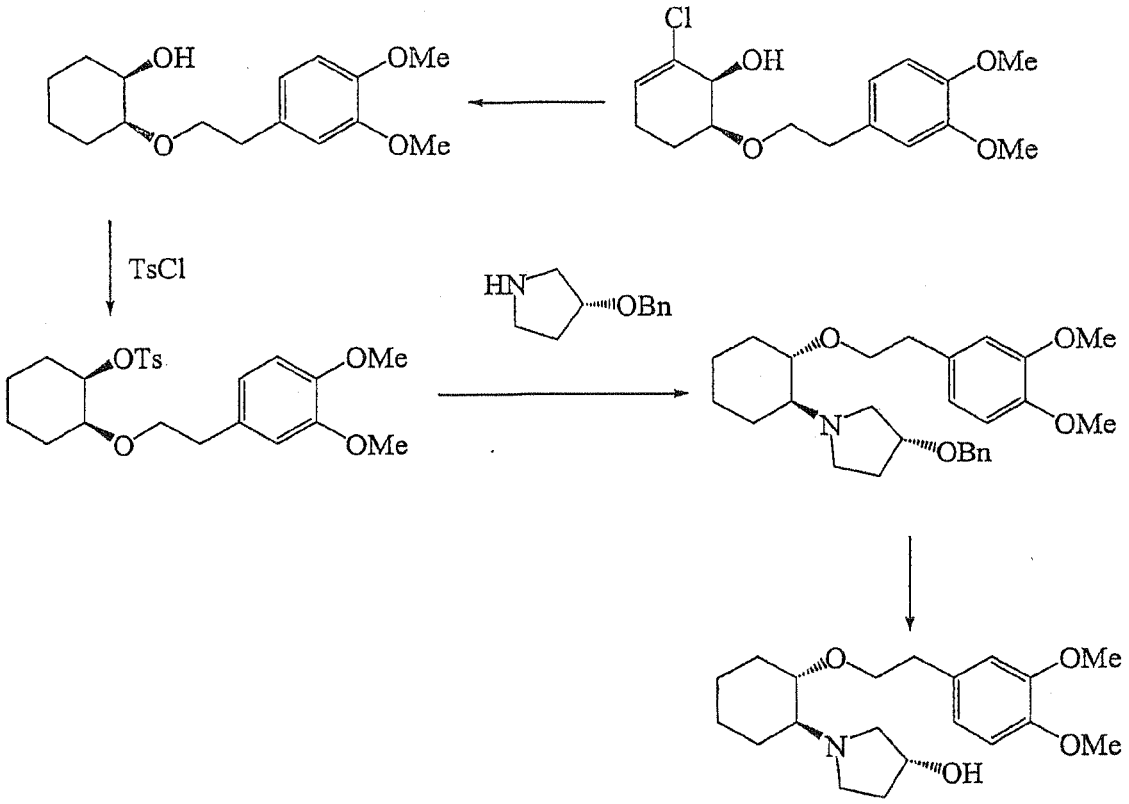


Figure 63

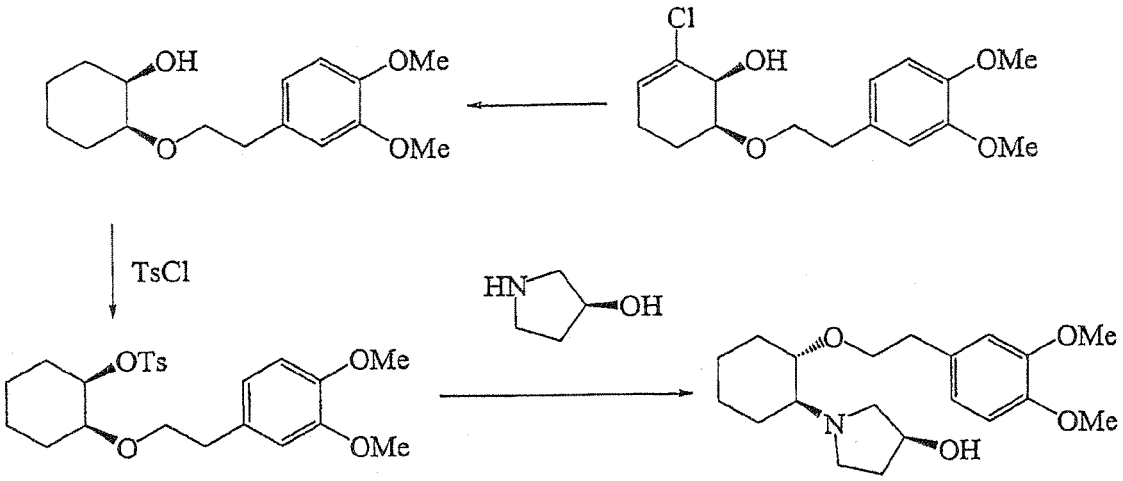


Figure 64

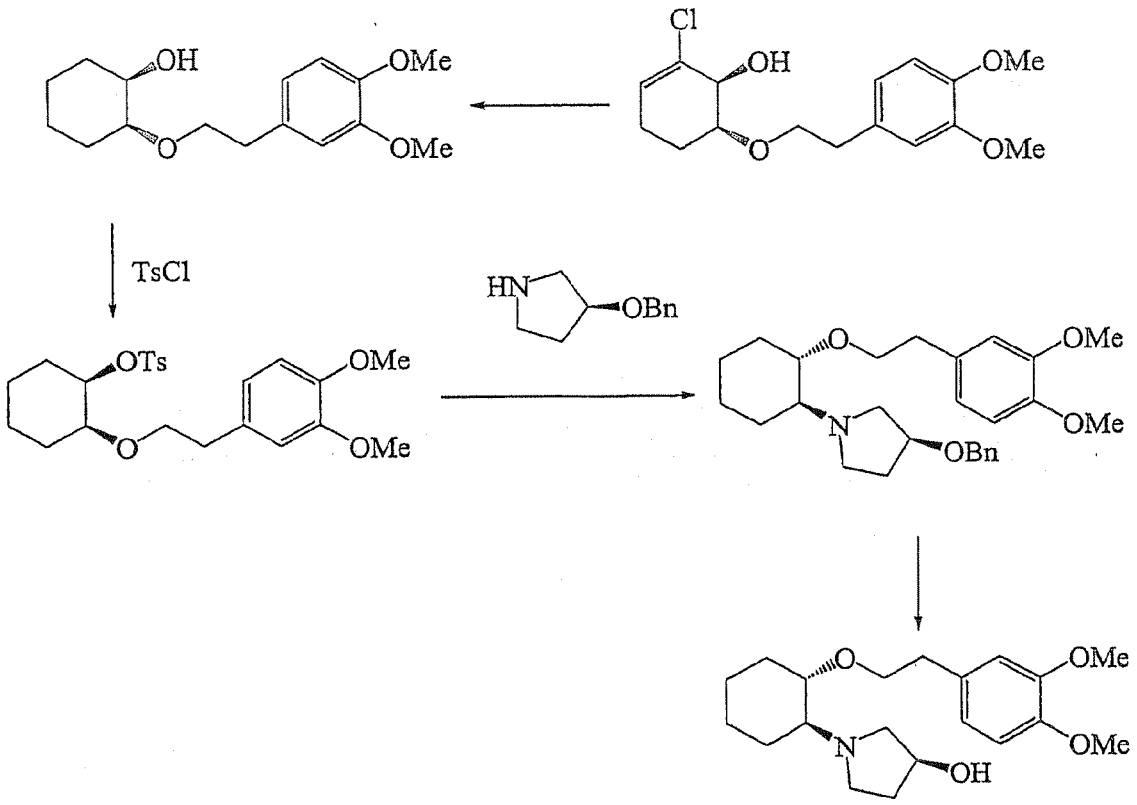

Cl
OH
OMe
OMe
O
OH
OMe
OMe
O
TsCl
HN
OBn
OTs
OMe
OMe
O
O
OMe
OMe
N
OBn
O
OMe
OMe
N
OH

Figure 65

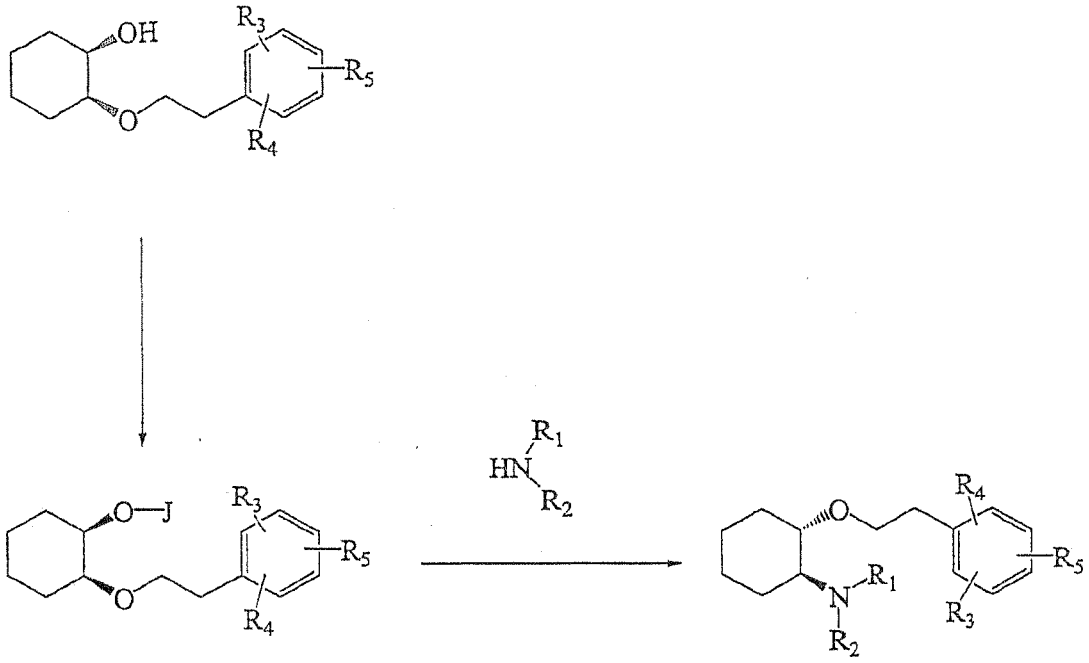


Figure 66

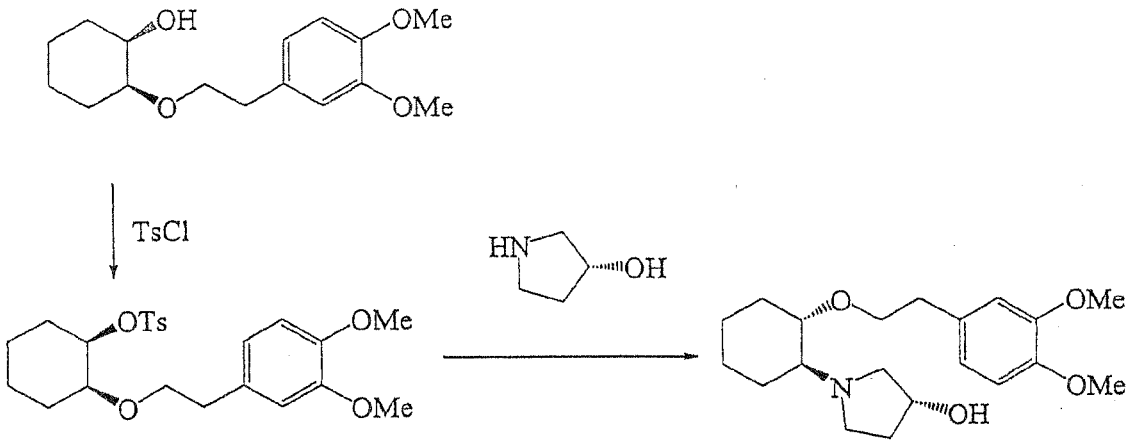


Figure 67

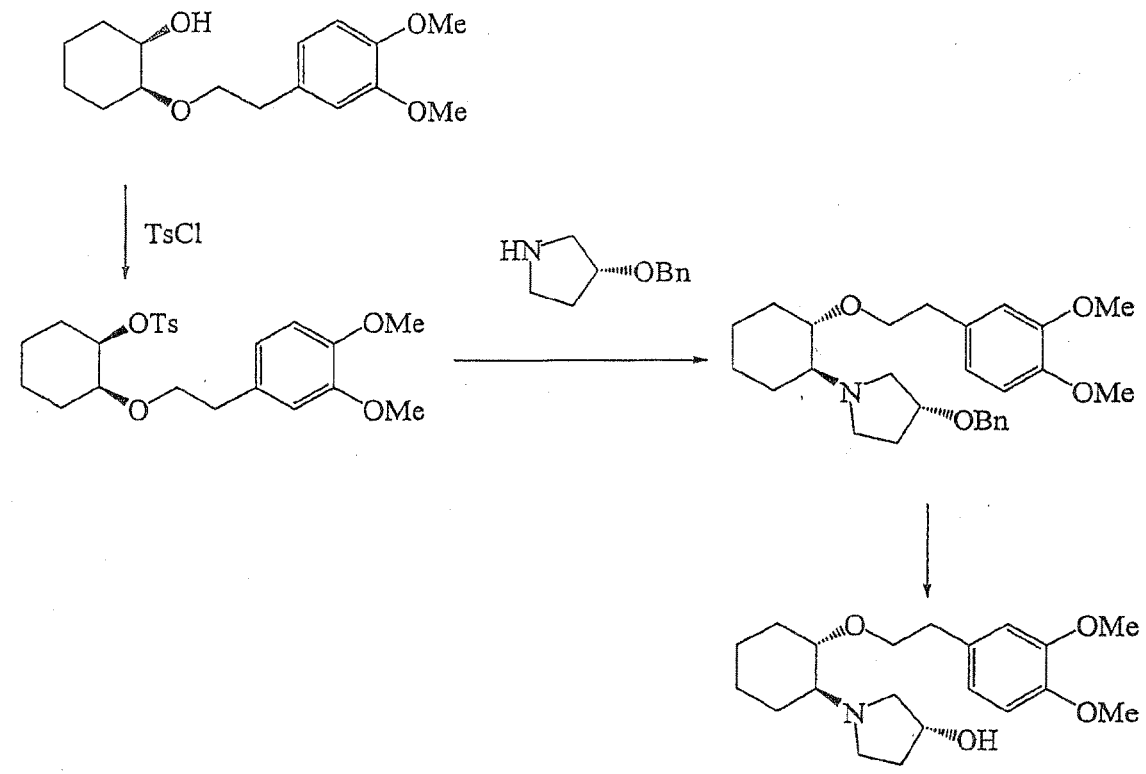


Figure 68

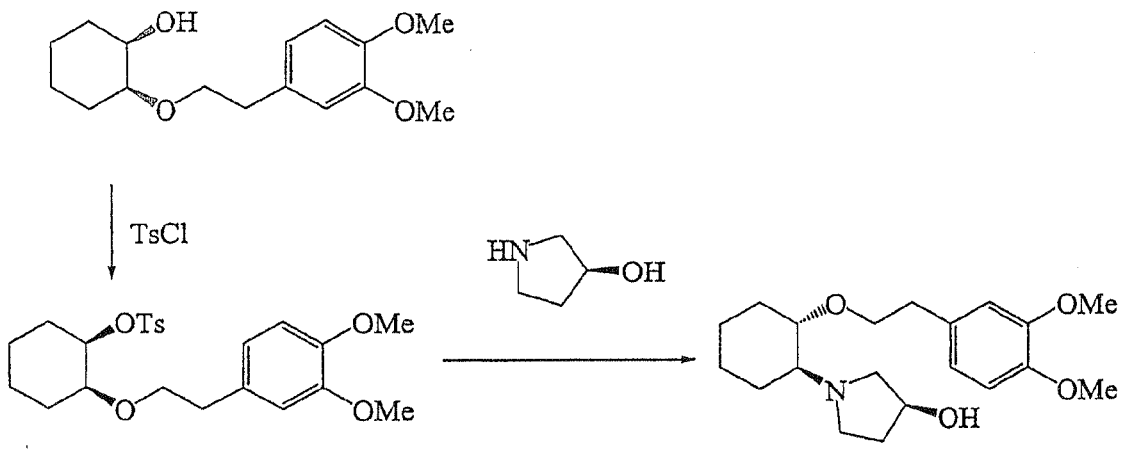


Figure 69

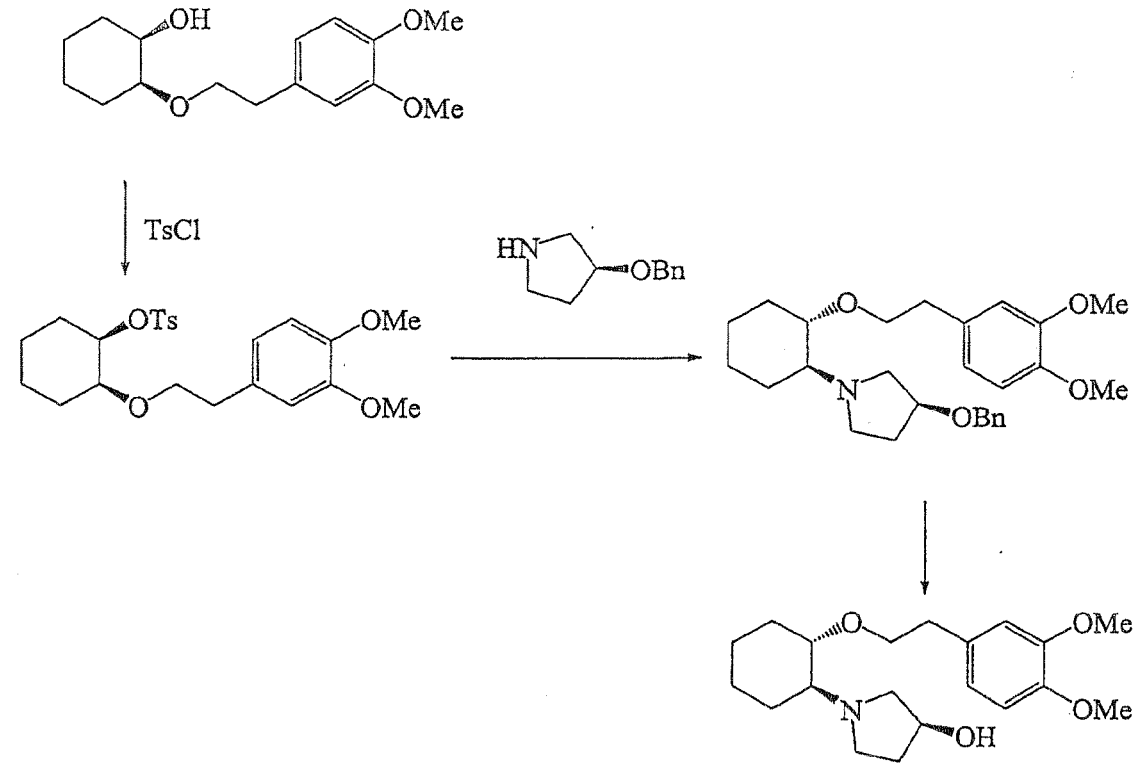


Figure 70

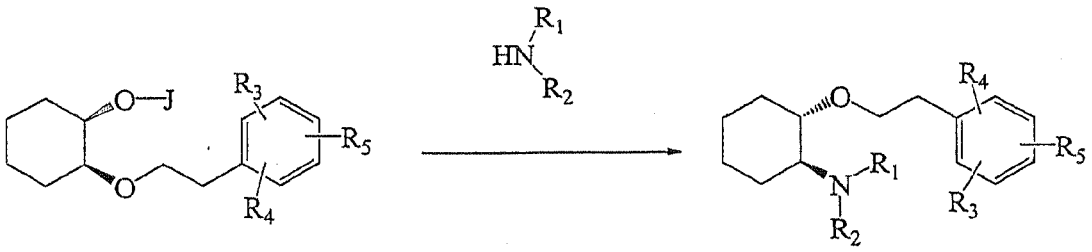


Figure 71

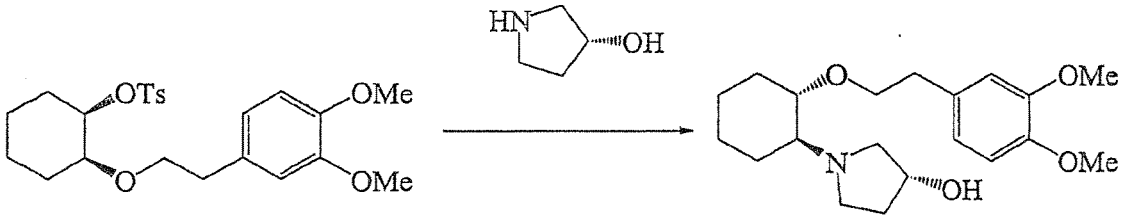


Figure 72

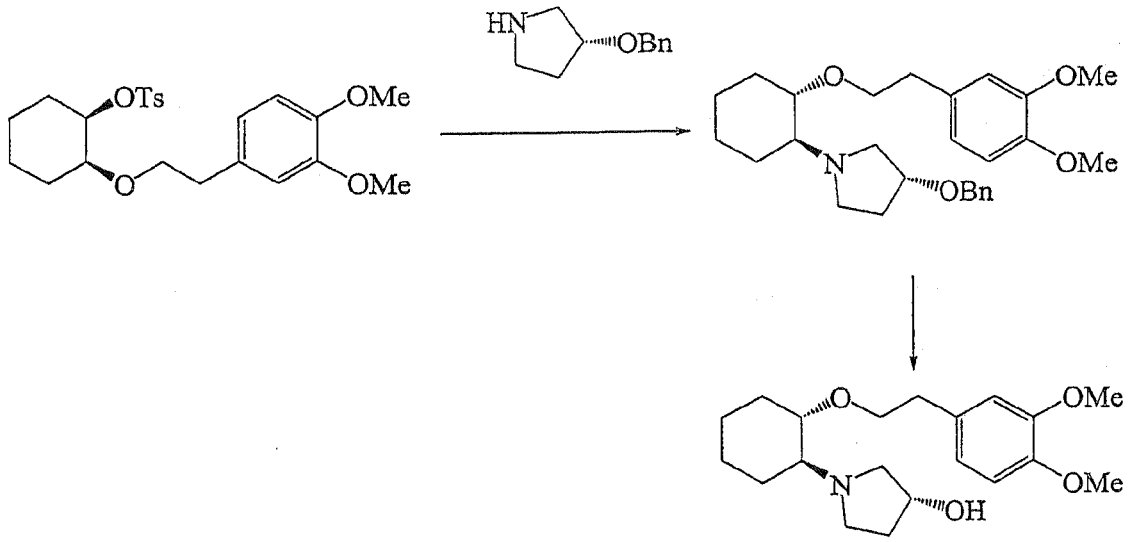


Figure 73

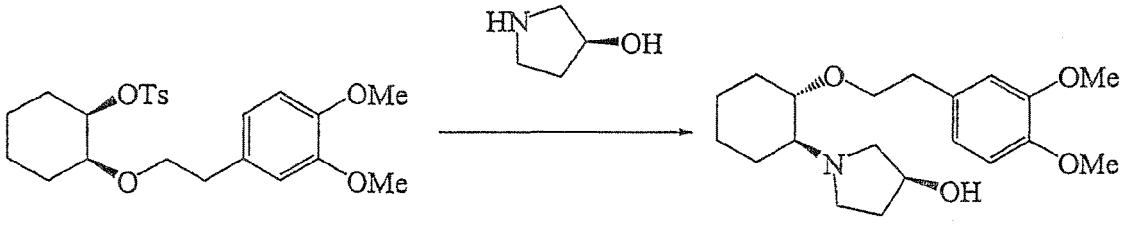


Figure 74

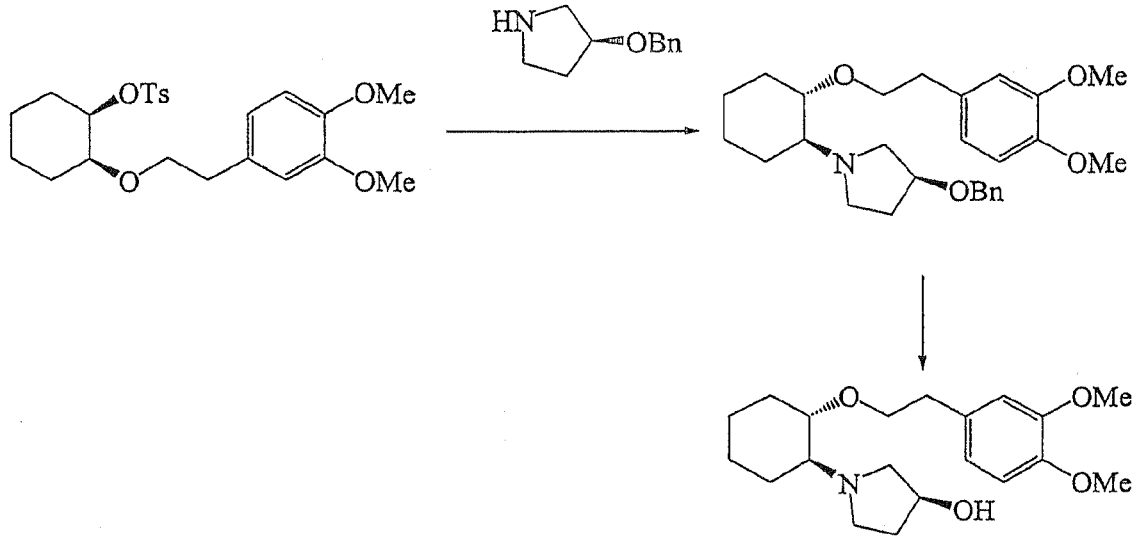


Figure 75

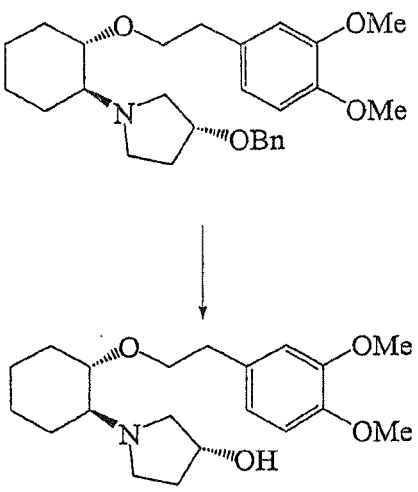


Figure 76

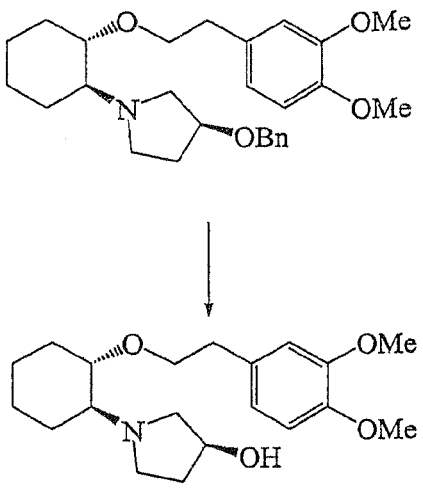


Figure 77

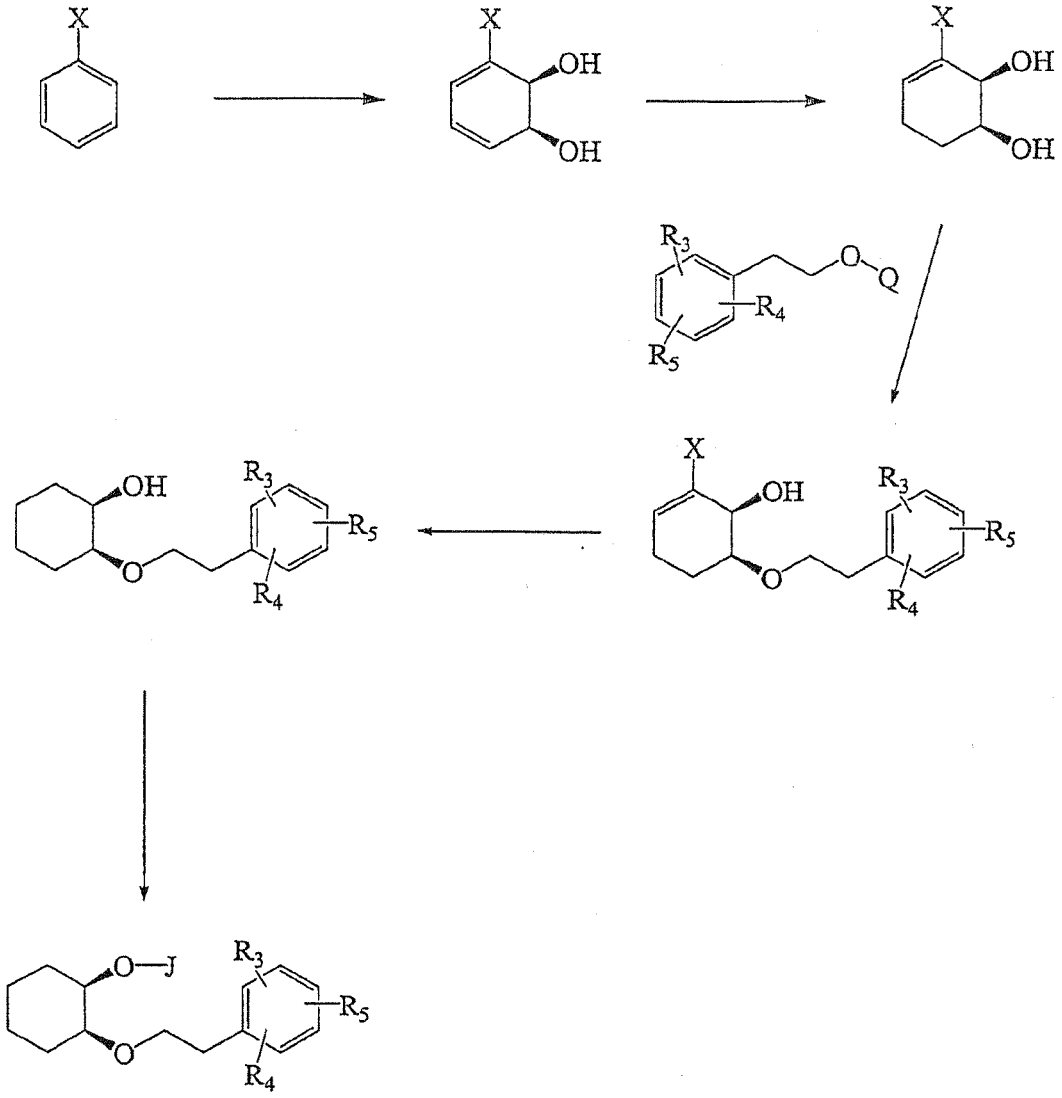


Figure 78

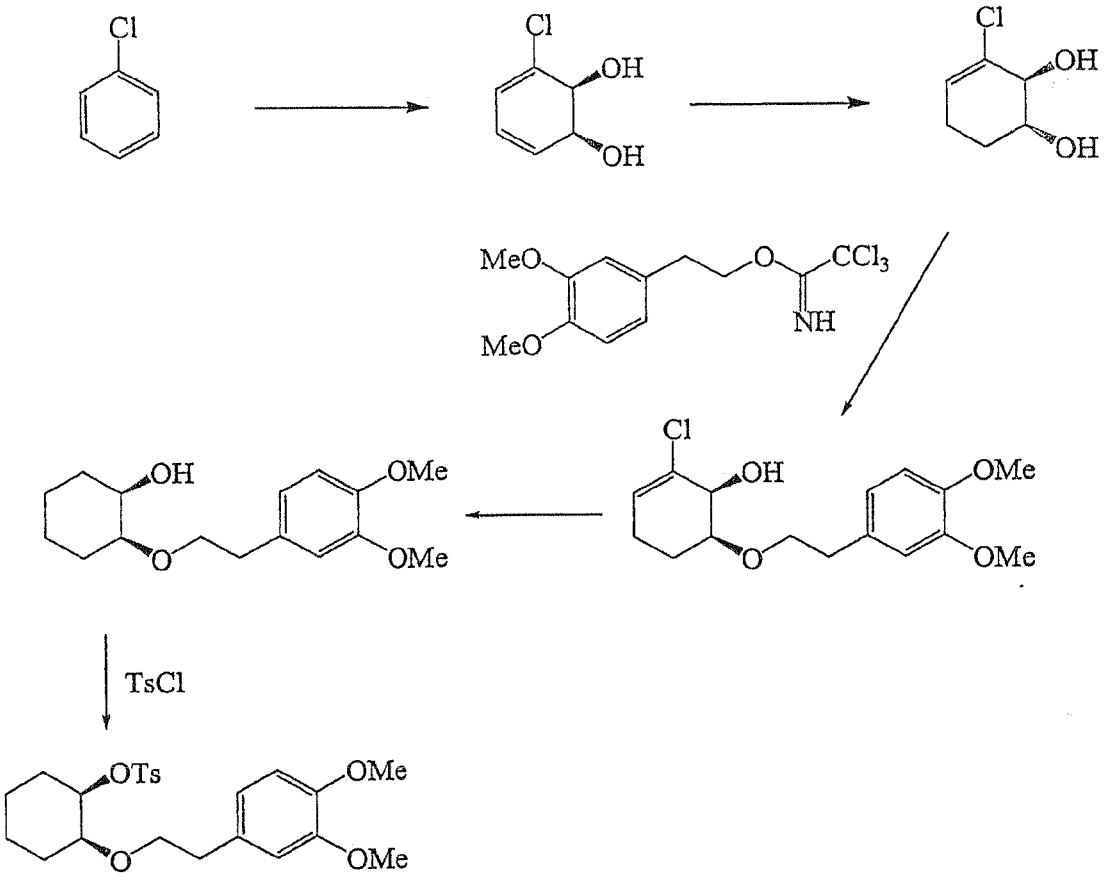

Cl
Cl
OH
OH
Cl
OH
OH
MeO
MeO
O
CCl3
NH
Cl
OH
O
OMe
OMe
OH
O
OMe
OMe
TsCl
OTs
O
OMe
OMe

Figure 79

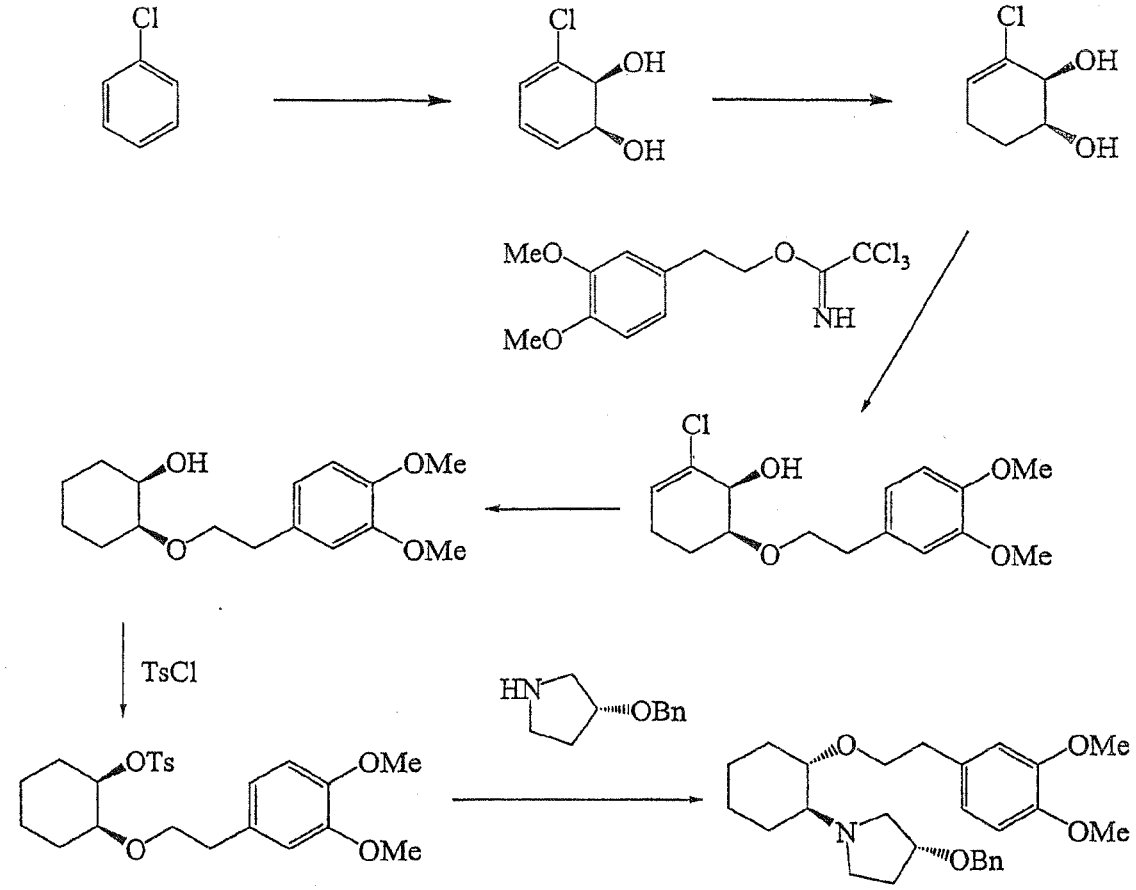


Figure 80

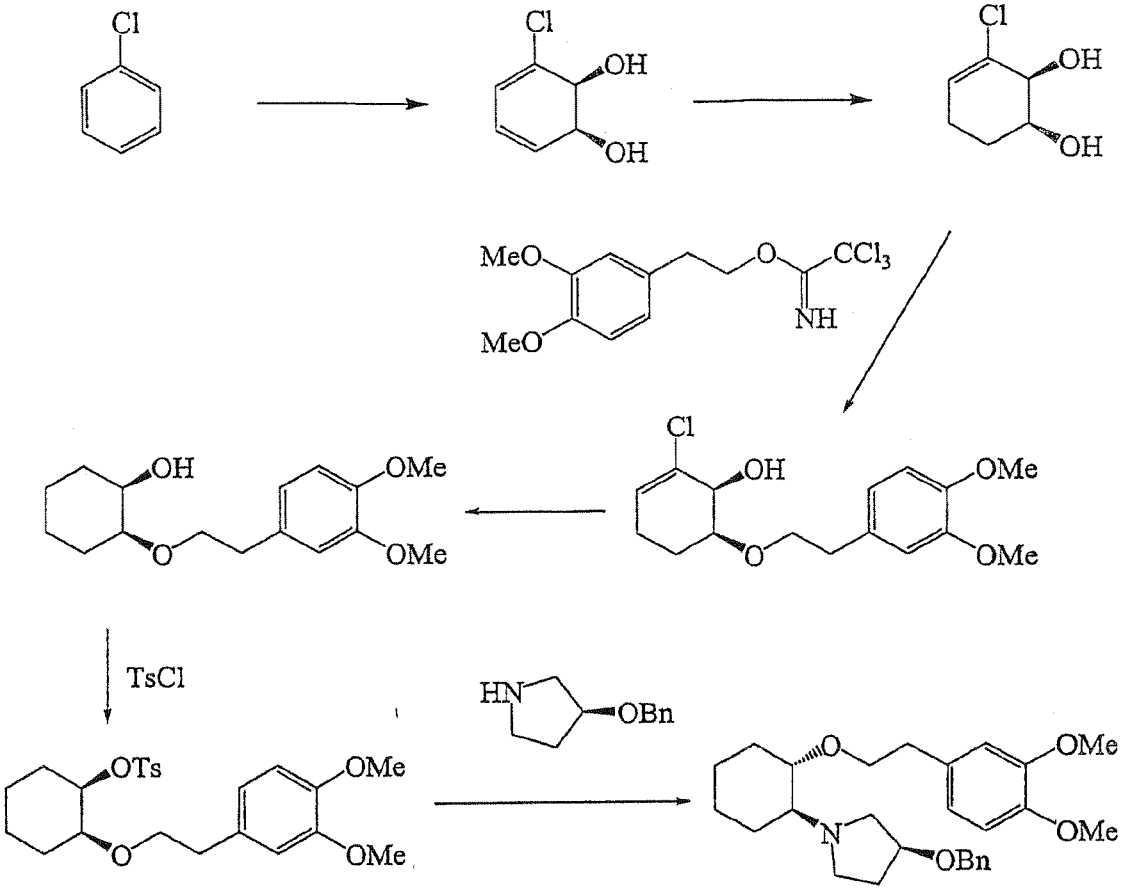


Figure 81

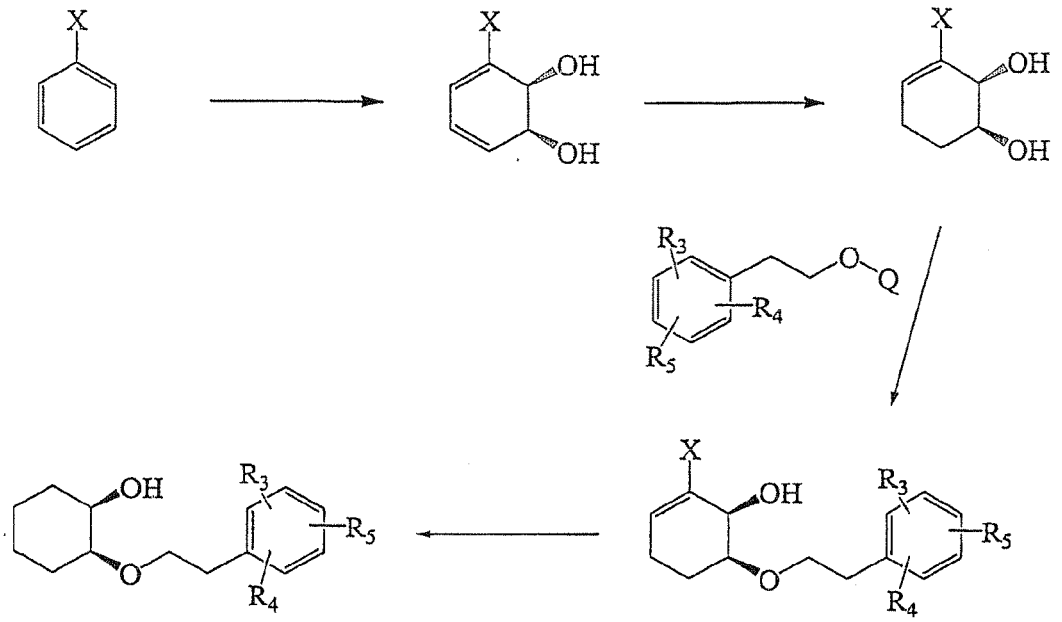


Figure 82

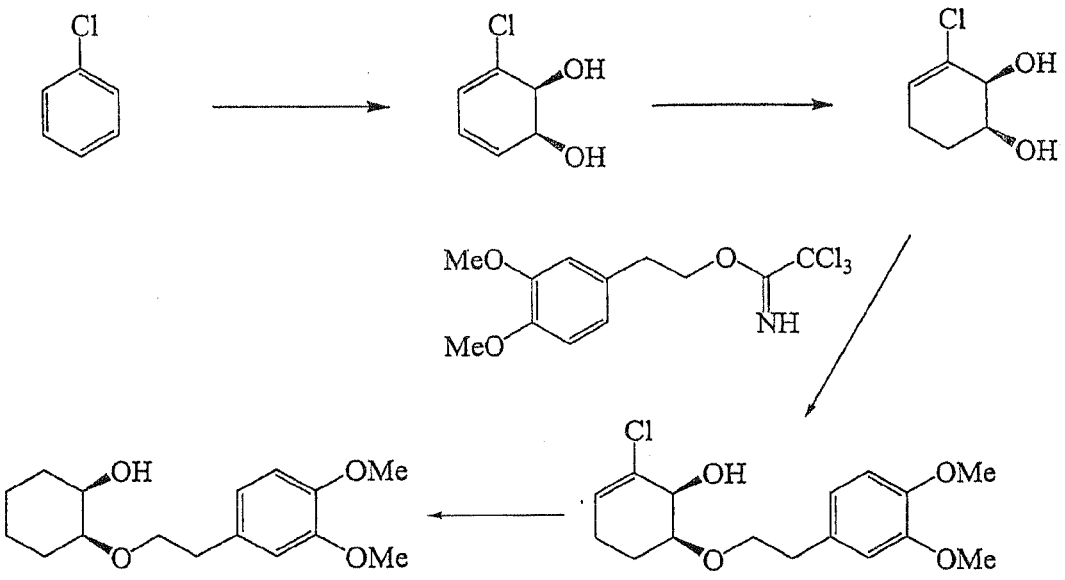


Figure 83

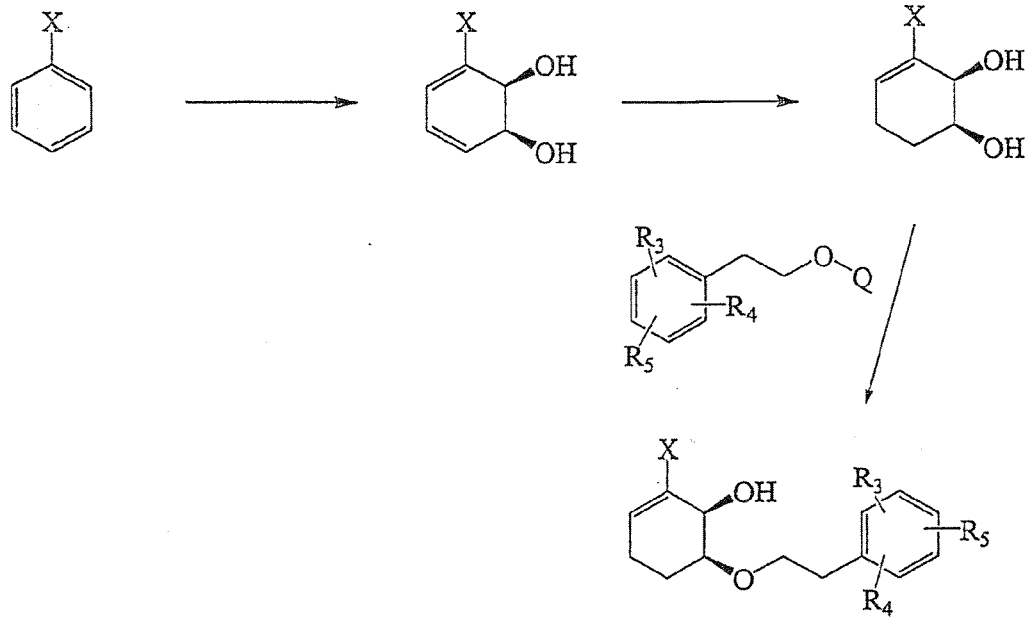


Figure 84

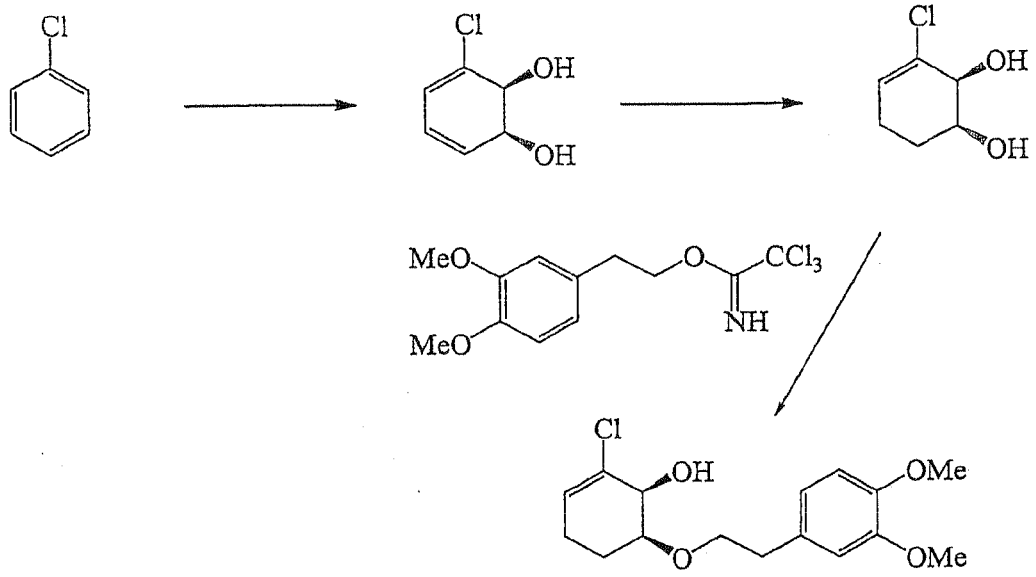


Figure 85

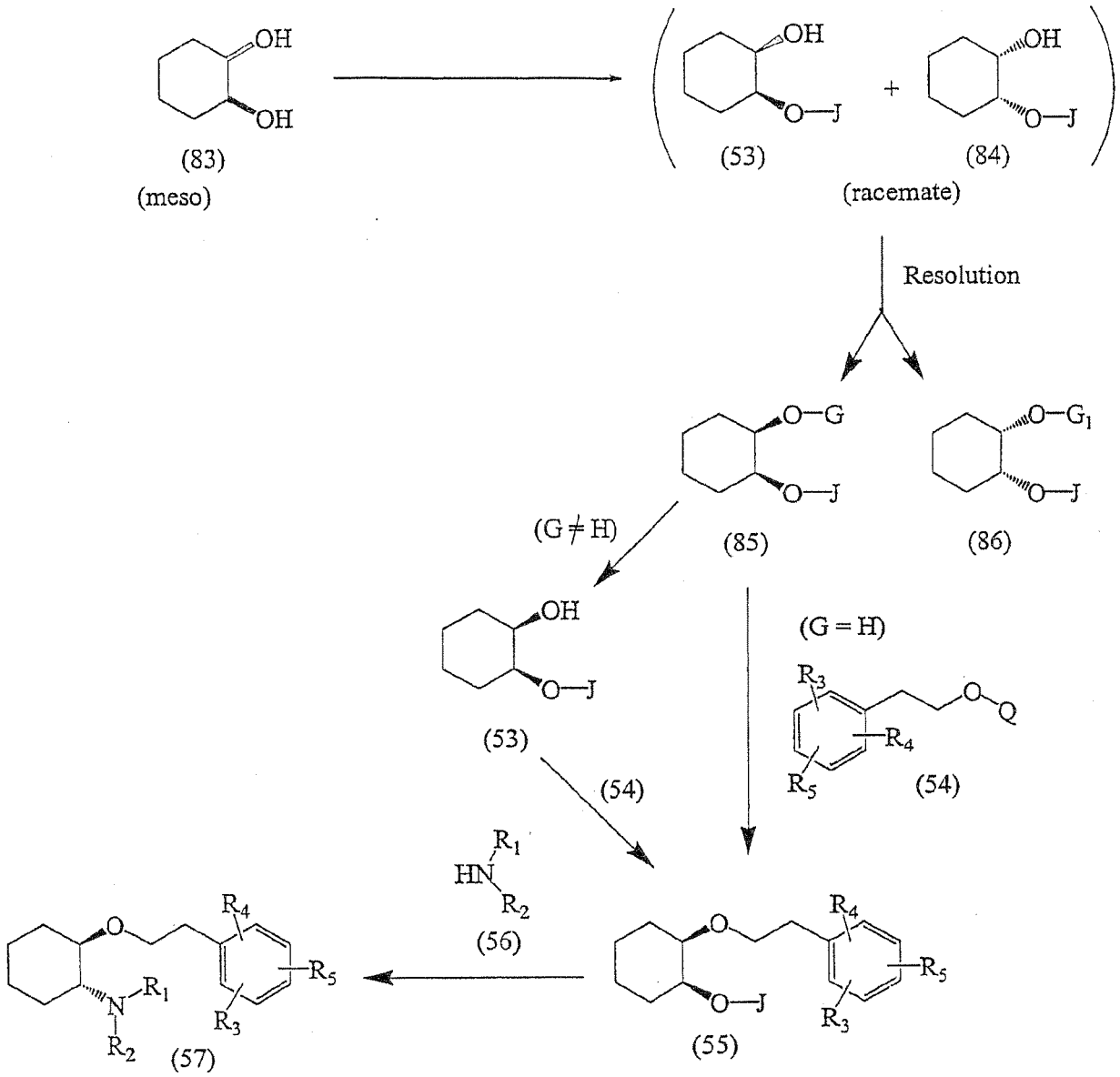

OH
OH
(83)
(meso)
OH
O—J
(53)
+
OH
O—J
(84)
(racemate)
Resolution
O—G
O—J
(85)
O—G1
O—J
(86)
(G ≠ H)
OH
O—J
(53)
(G = H)
R3
R4
R5
O—Q
(54)
(54)
R1
HN
R2
(56)
R4
O
R5
R1
N
R2
R3
(57)
R4
O
R5
O—J
R3
(55)

Figure 86

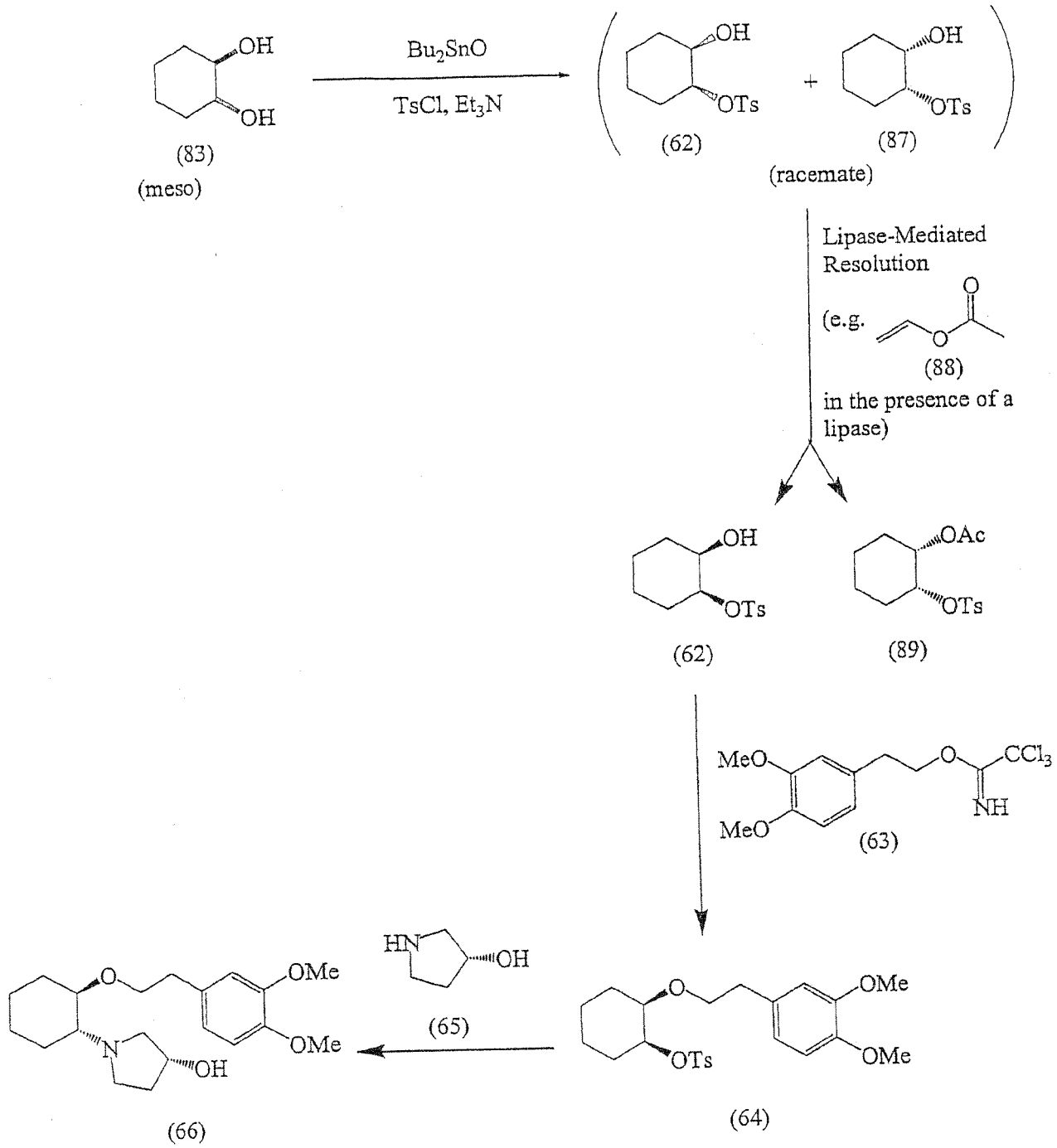

OH
OH
(83)
(meso)
Bu_2SnO
TsCl, Et_3N
OH
OTs
(62)
+
OH
OTs
(87)
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
(88)
in the presence of a lipase)
OH
OTs
(62)
OAc
OTs
(89)
MeO
MeO
O
CCl_3
NH
(63)
HN
OH
(65)
O
OMe
OMe
N
OH
(66)
O
OTs
OMe
OMe
(64)

Figure 87

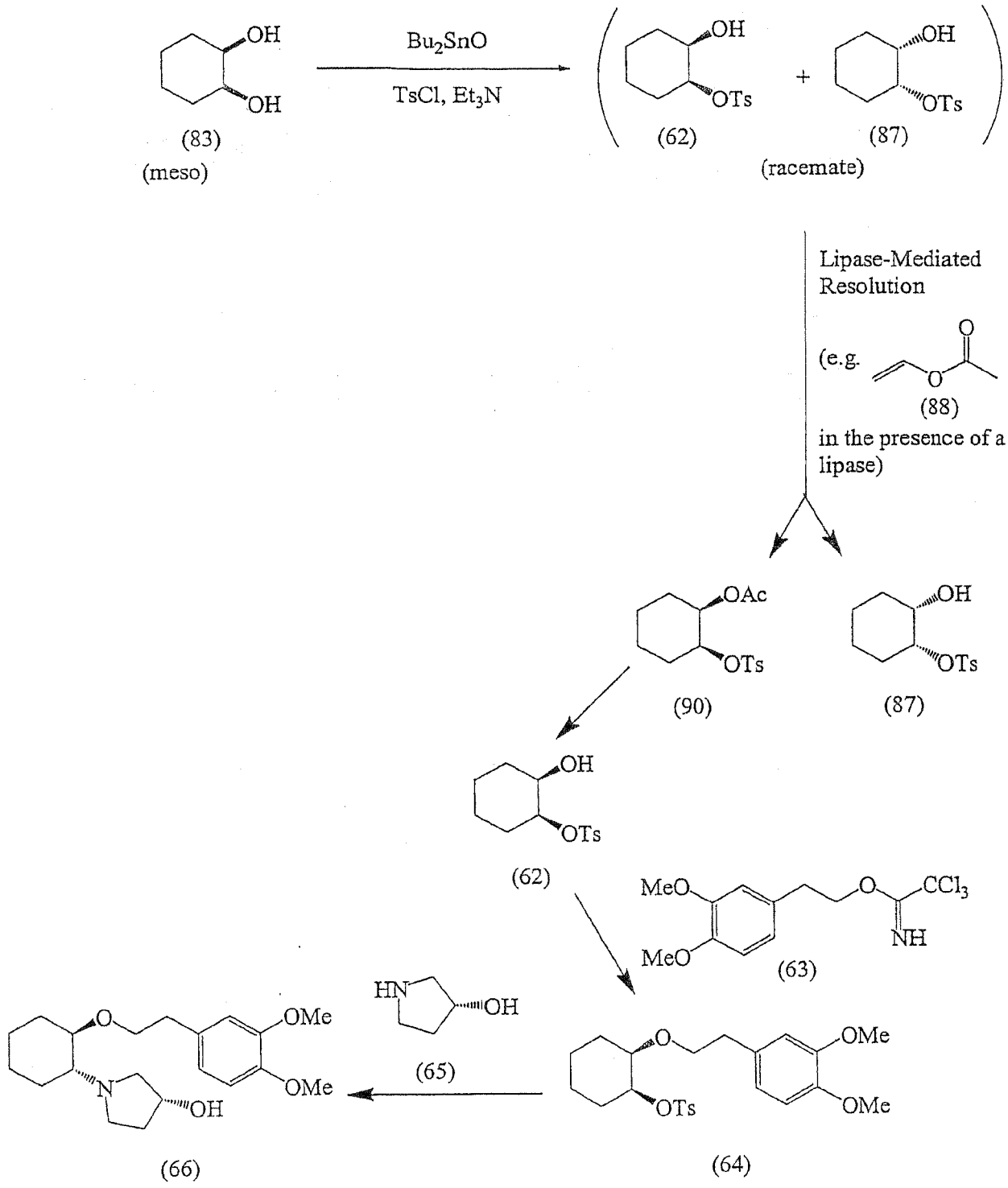

OH
OH
(83)
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
(62)
+
OH
OTs
(87)
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
(88)
in the presence of a lipase)
OAc
OTs
(90)
OH
OTs
(87)
OH
OTs
(62)
MeO
MeO
O
CCl3
NH
(63)
HN
OH
(65)
O
OMe
OMe
OTs
(64)
O
OMe
OMe
N
OH
(66)

Figure 88

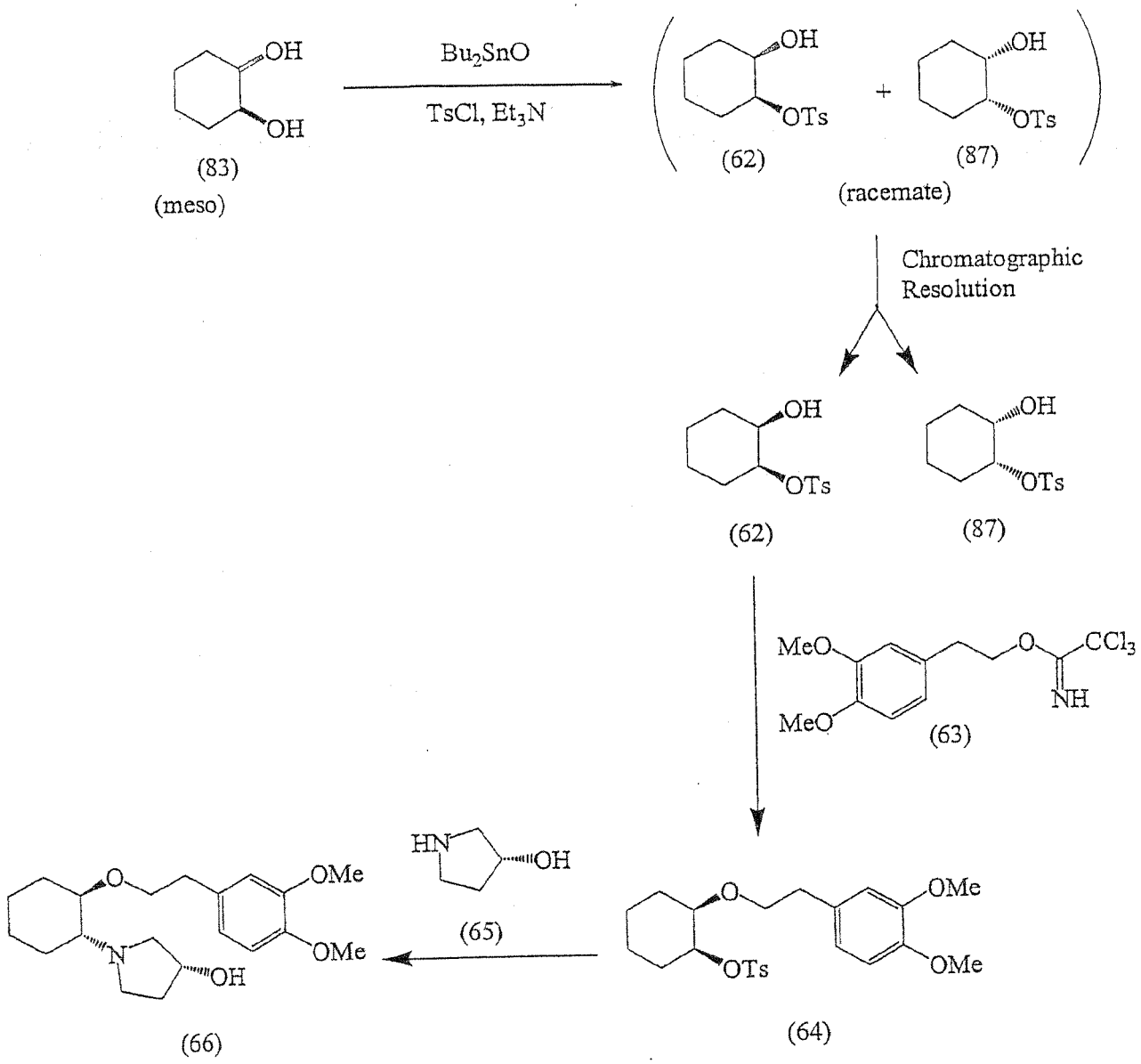

OH
OH
(83)
(meso)
Bu_2SnO
TsCl, Et_3N
OH
OTs
(62)
+
OH
OTs
(87)
(racemate)
Chromatographic Resolution
OH
OTs
(62)
OH
OTs
(87)
MeO
MeO
O
CCl_3
NH
(63)
HN
OH
(65)
O
OMe
OMe
OTs
(64)
O
OMe
OMe
N
OH
(66)

Figure 89

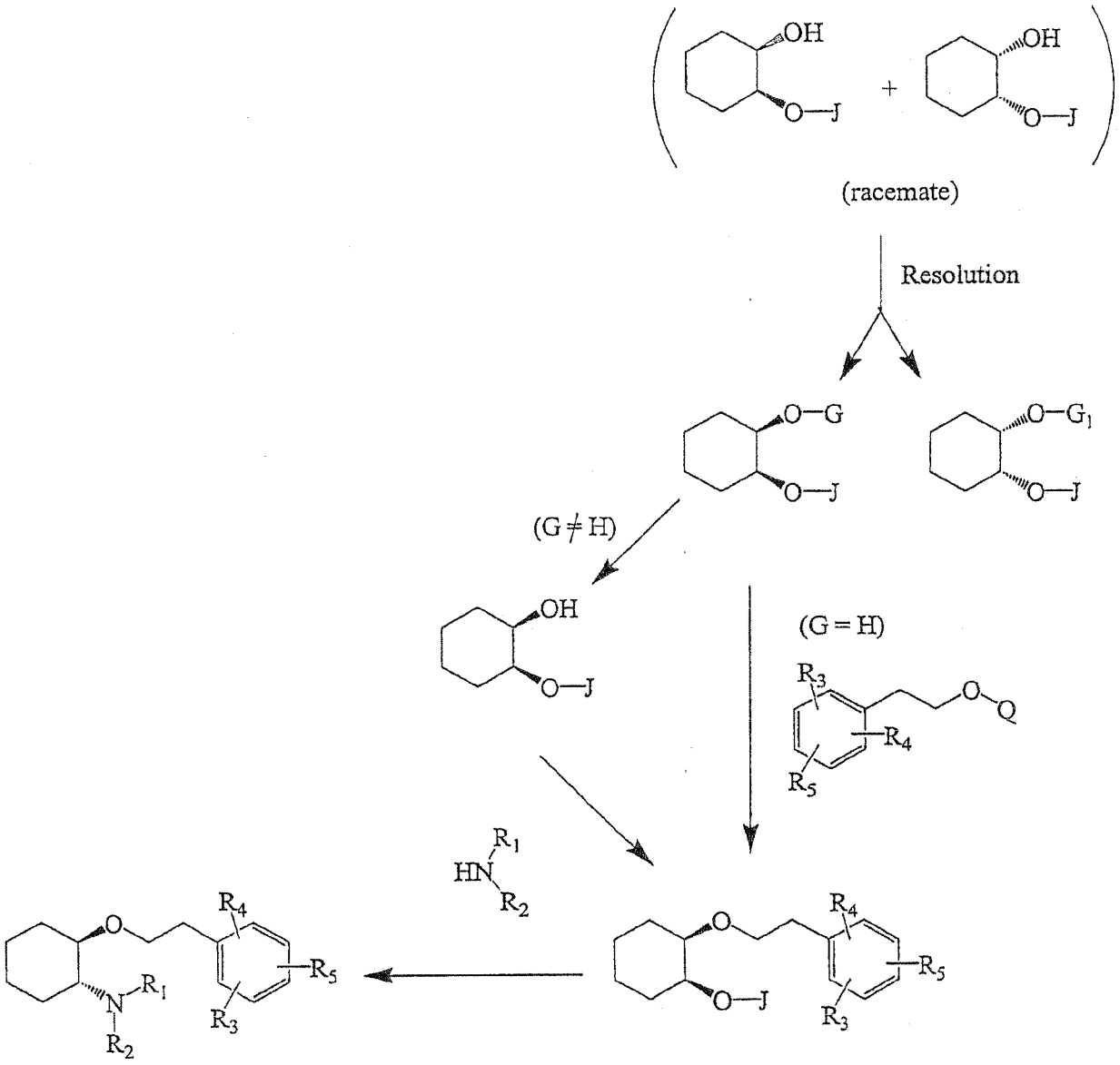

OH
O—J
+
OH
O—J
(racemate)
Resolution
O—G
O—J
O—G1
O—J
(G ≠ H)
OH
O—J
(G = H)
R3
O
Q
R4
R5
R1
HN
R2
R4
O
R5
R1
N
R2
R3
O
O—J
R4
R5
R3

Figure 90

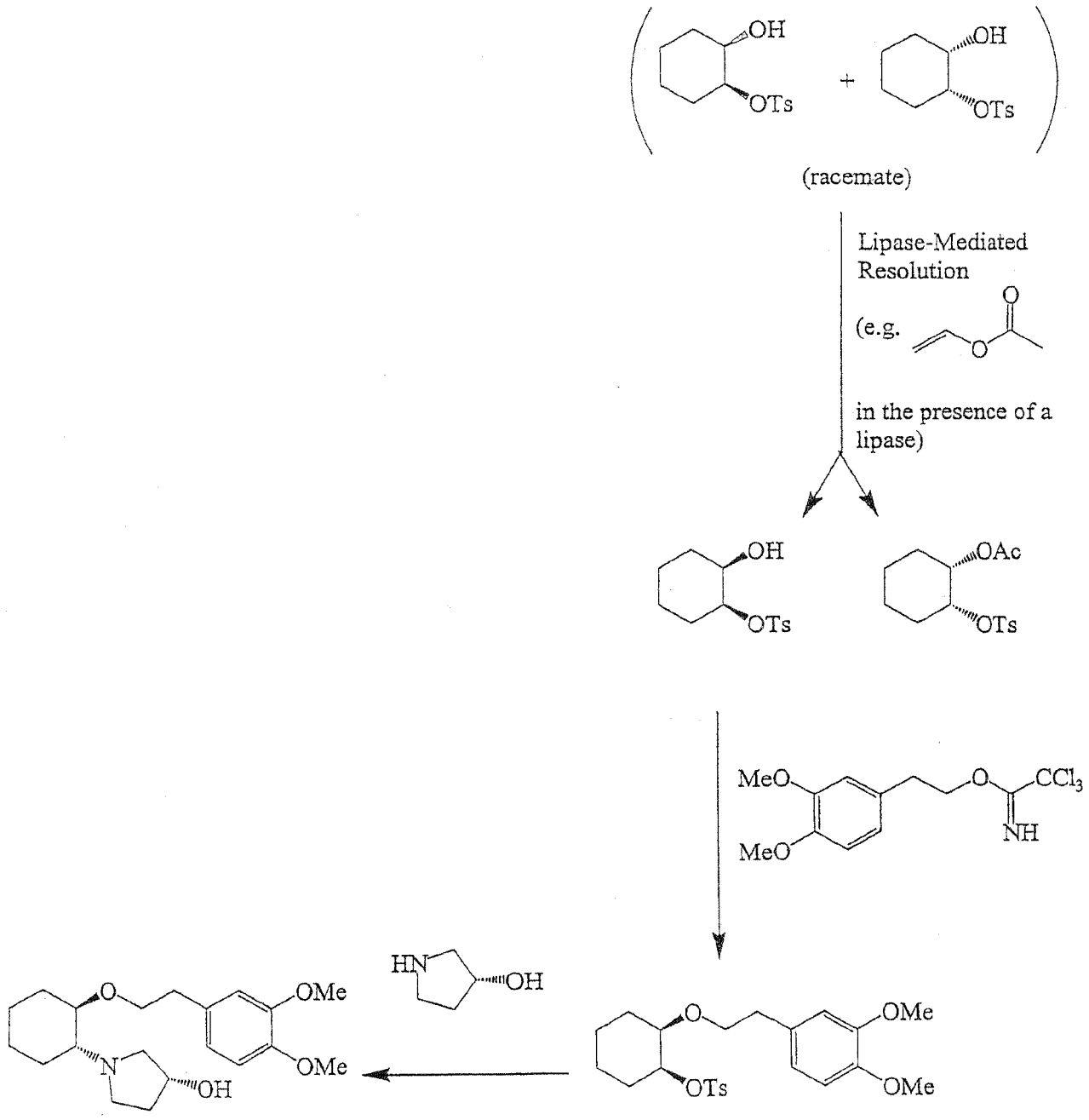

OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OH
OTs
OAc
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OMe
OTs
OMe

Figure 91

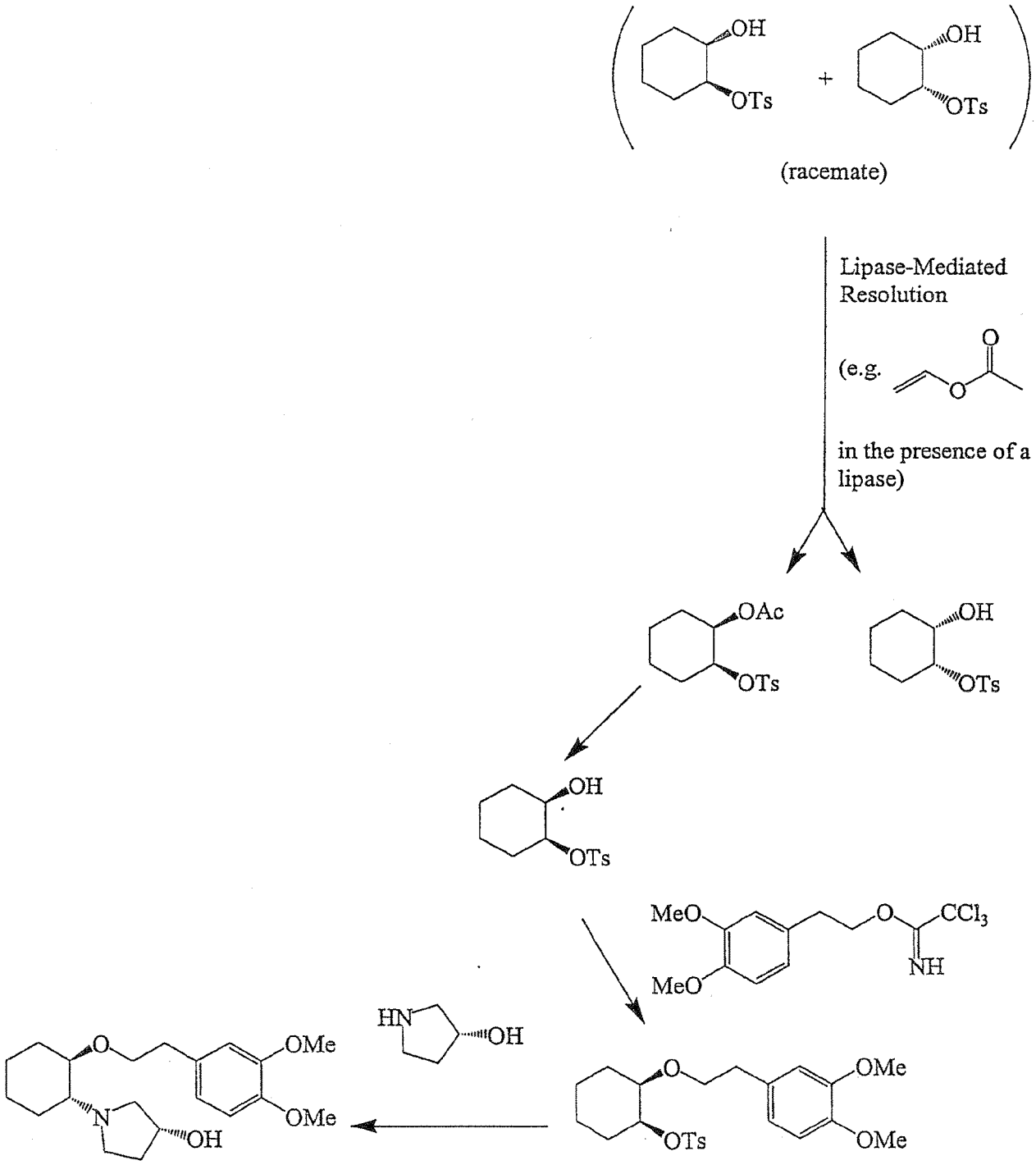

OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OAc
OTs
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OTs
OMe
OMe

Figure 92

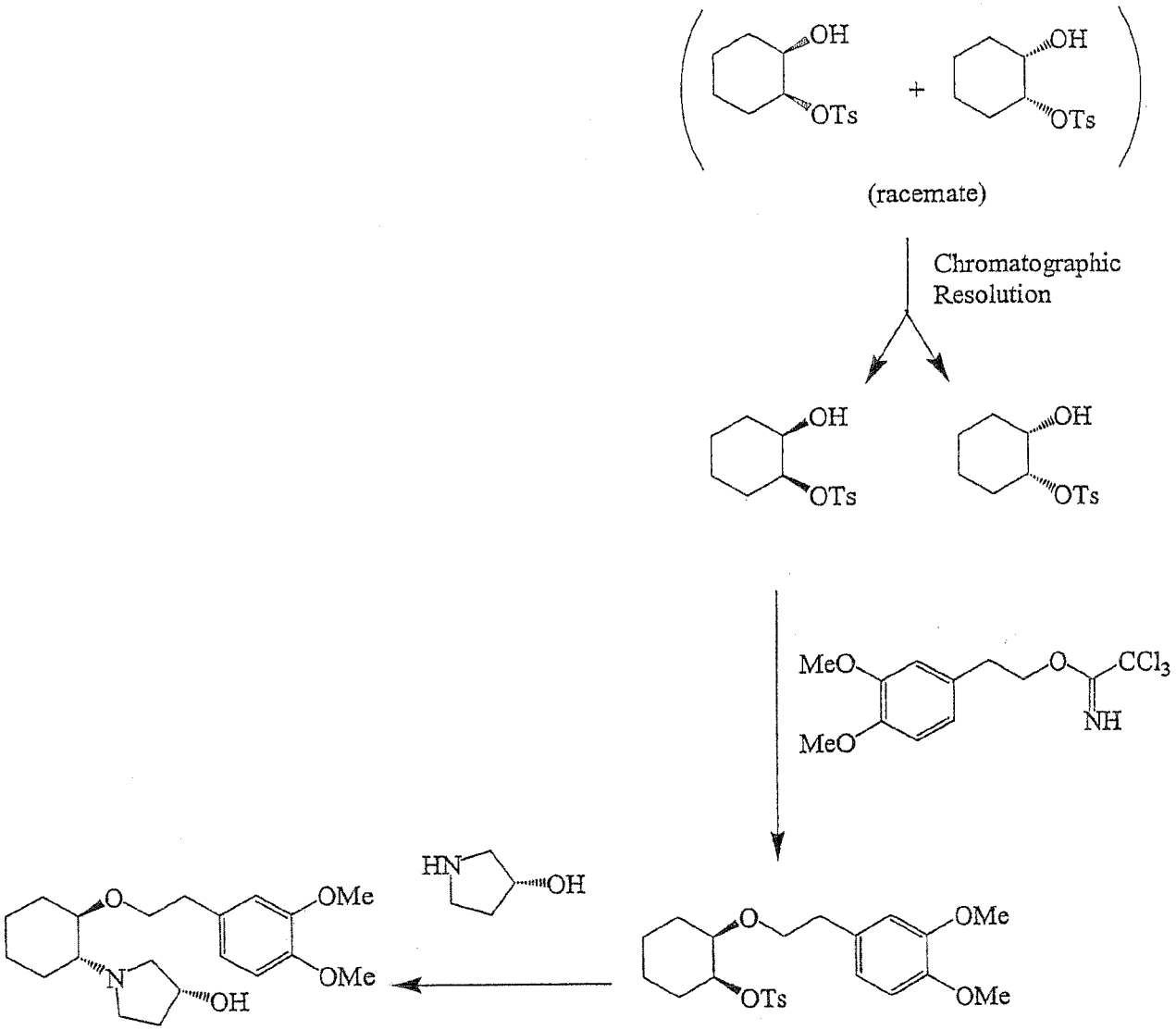

OH
OTs
+
OH
OTs
(racemate)
Chromatographic
Resolution
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OTs
OMe
OMe

Figure 93

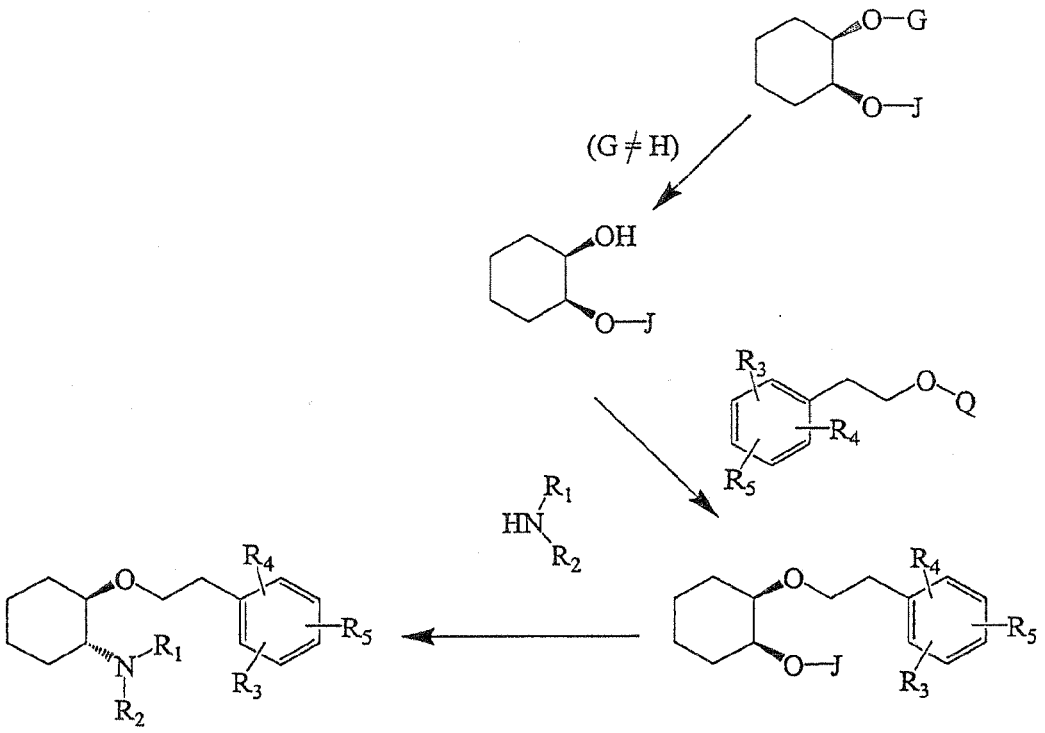


Figure 94

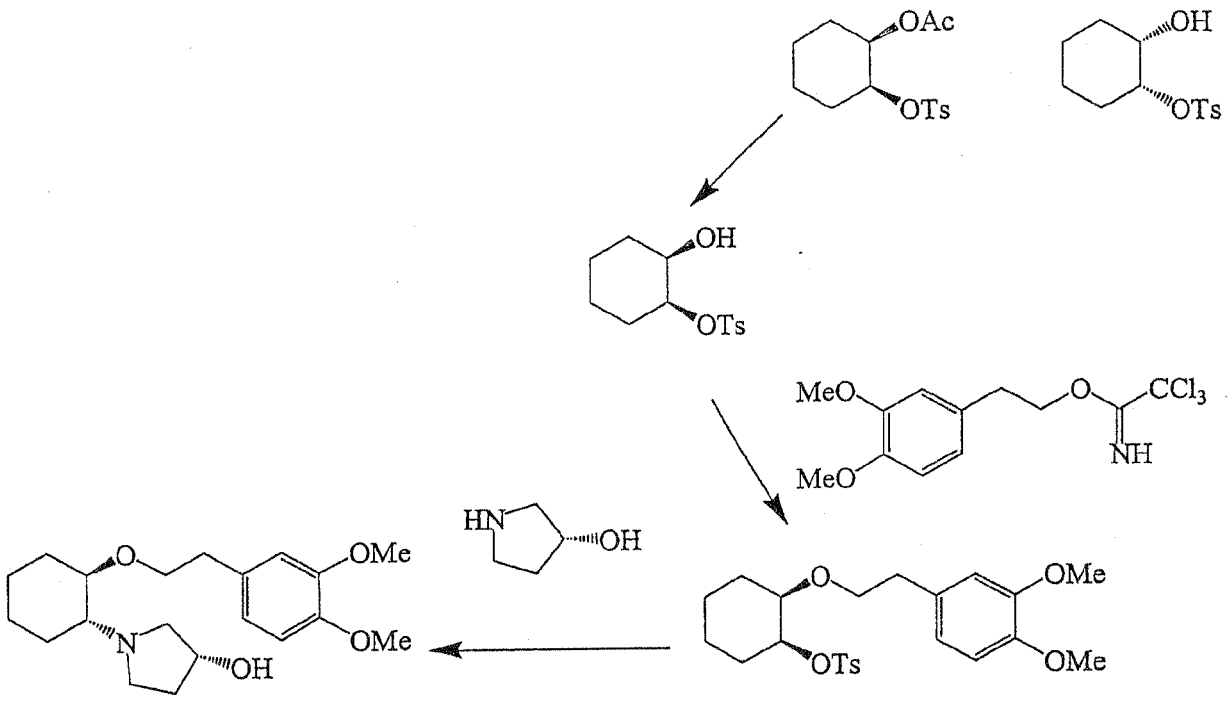

OAc
OTs
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OMe
OMe
OTs

Figure 95

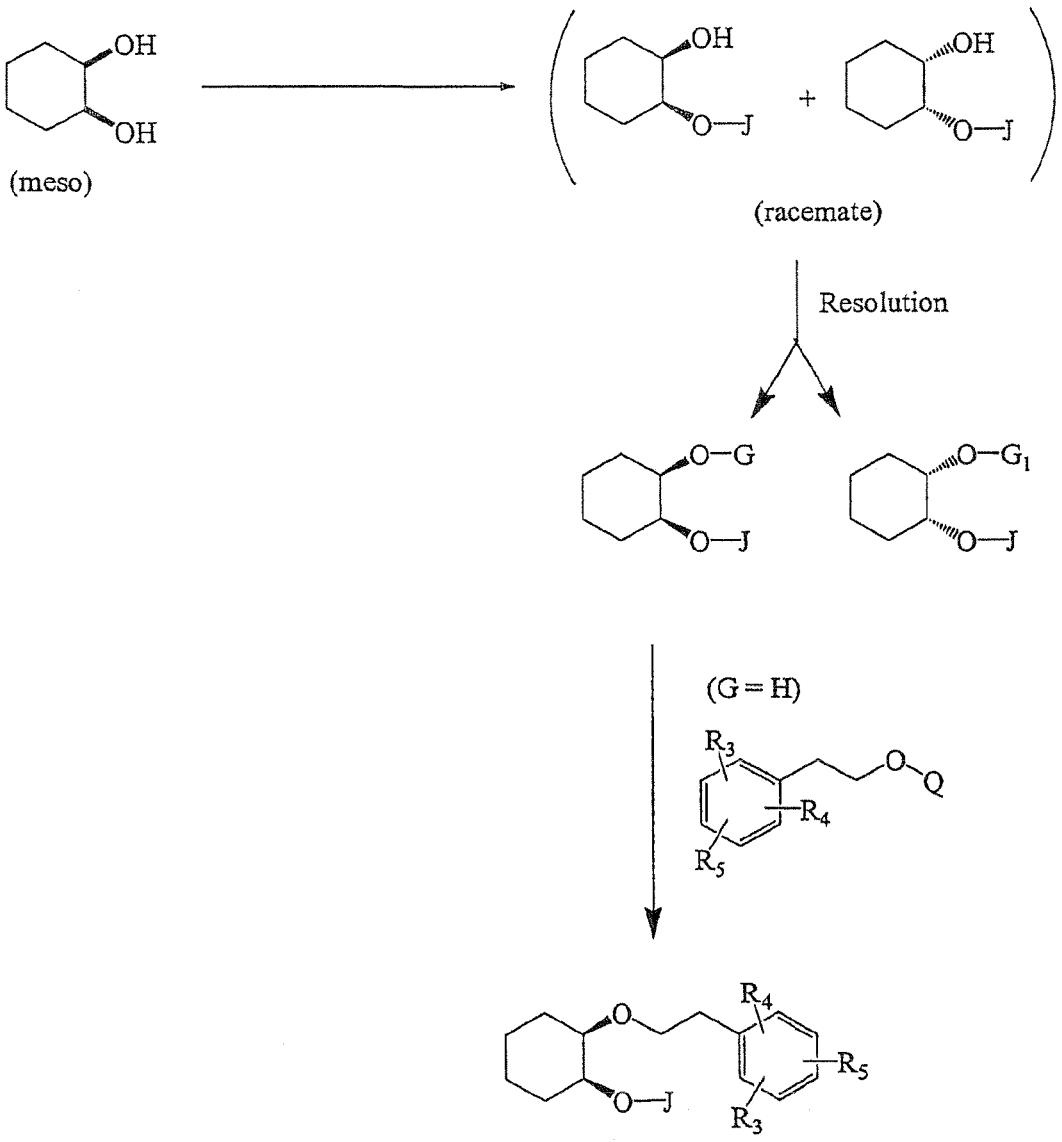

OH
OH
(meso)
OH
O—J
+
OH
O—J
(racemate)
Resolution
O—G
O—J
O—G1
O—J
(G = H)
R3
R4
R5
O
Q
R4
O
R5
O—J
R3

Figure 96

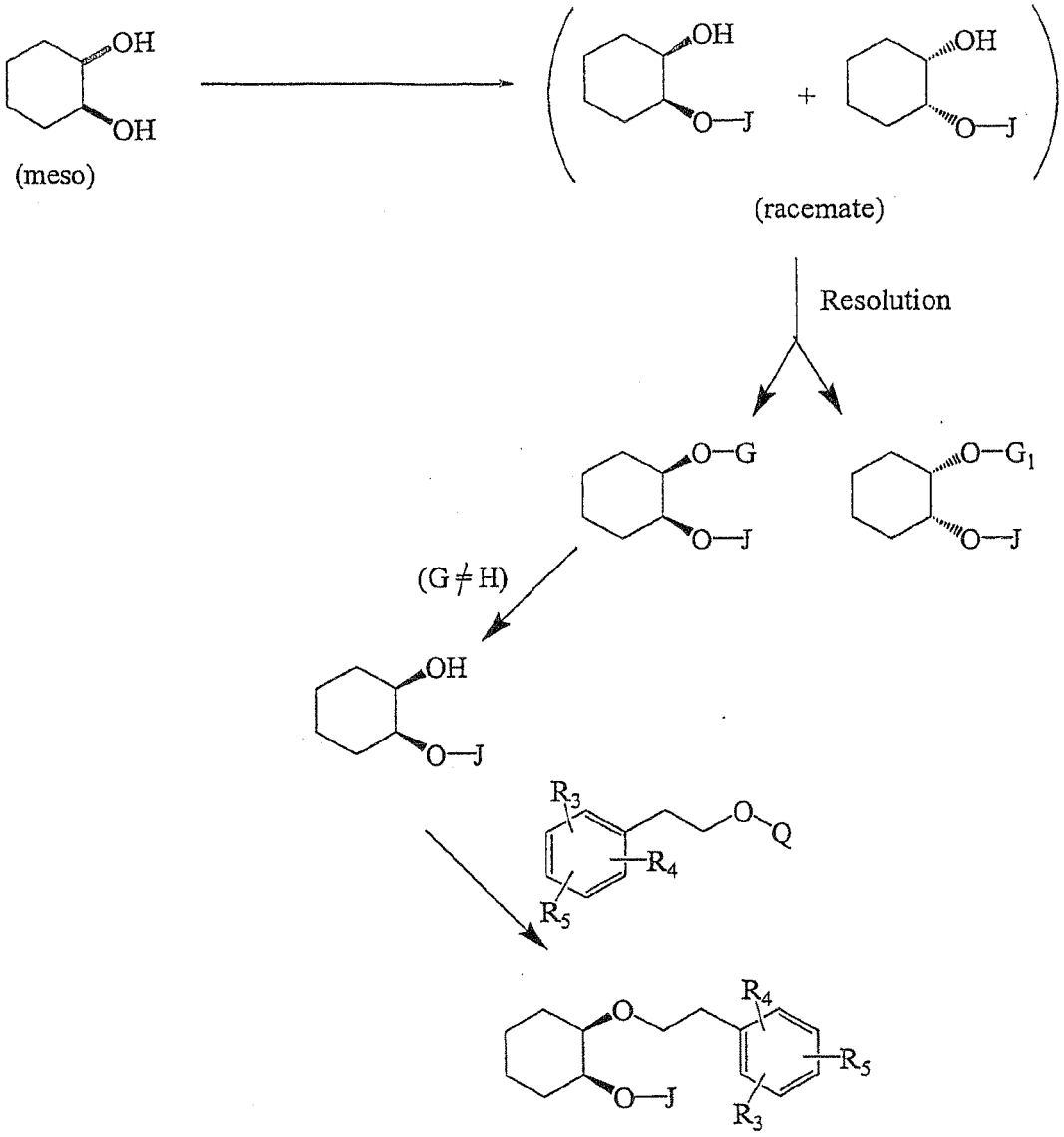

OH
OH
(meso)
OH
O—J
+
OH
O—J
(racemate)
Resolution
O—G
O—J
O—G1
O—J
(G≠H)
OH
O—J
R3
R4
R5
O
Q
R4
R5
O
O—J
R3

Figure 97

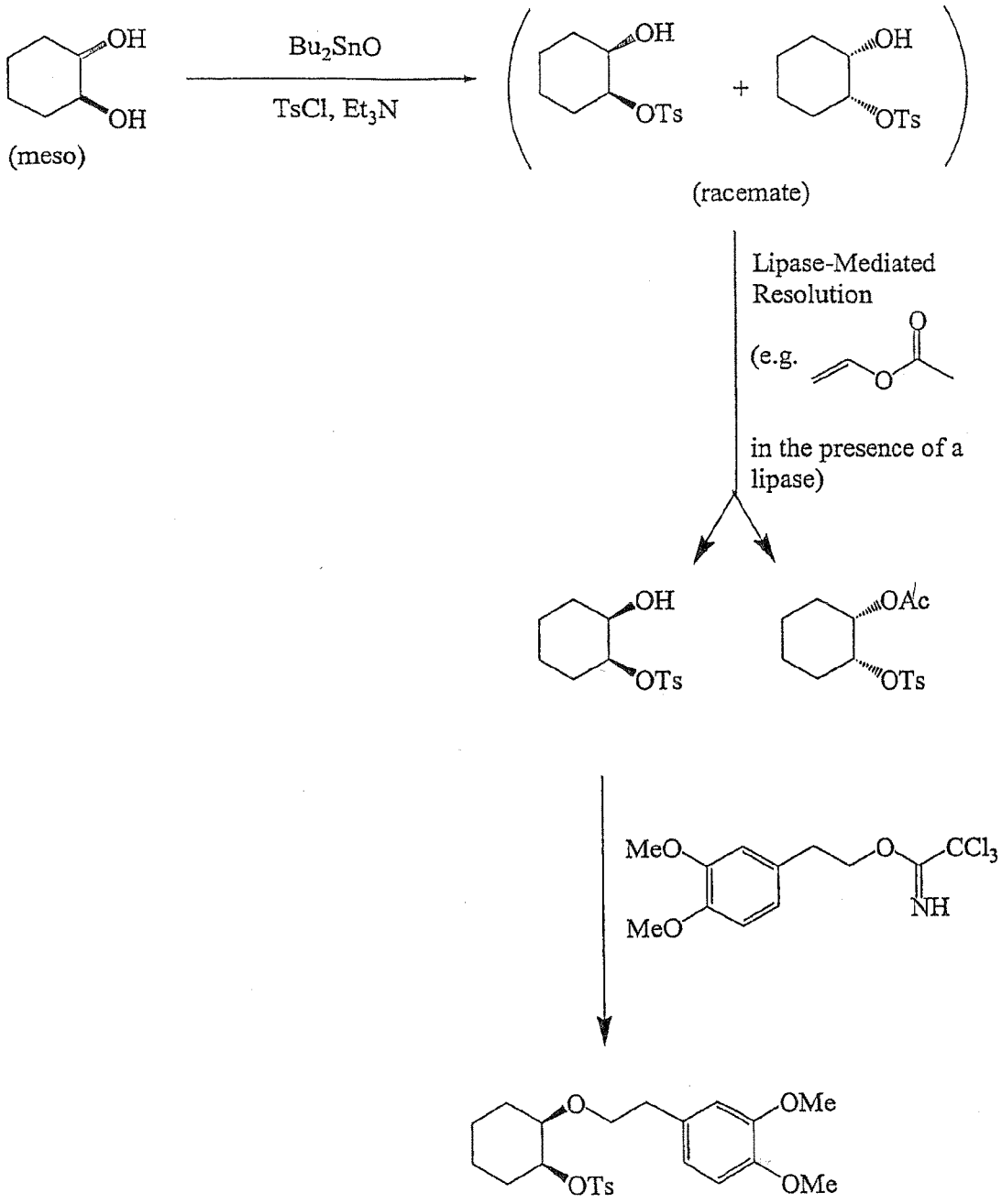

OH
OH
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OH
OTs
OAc
OTs
MeO
MeO
O
CCl3
NH
O
OTs
OMe
OMe

Figure 98

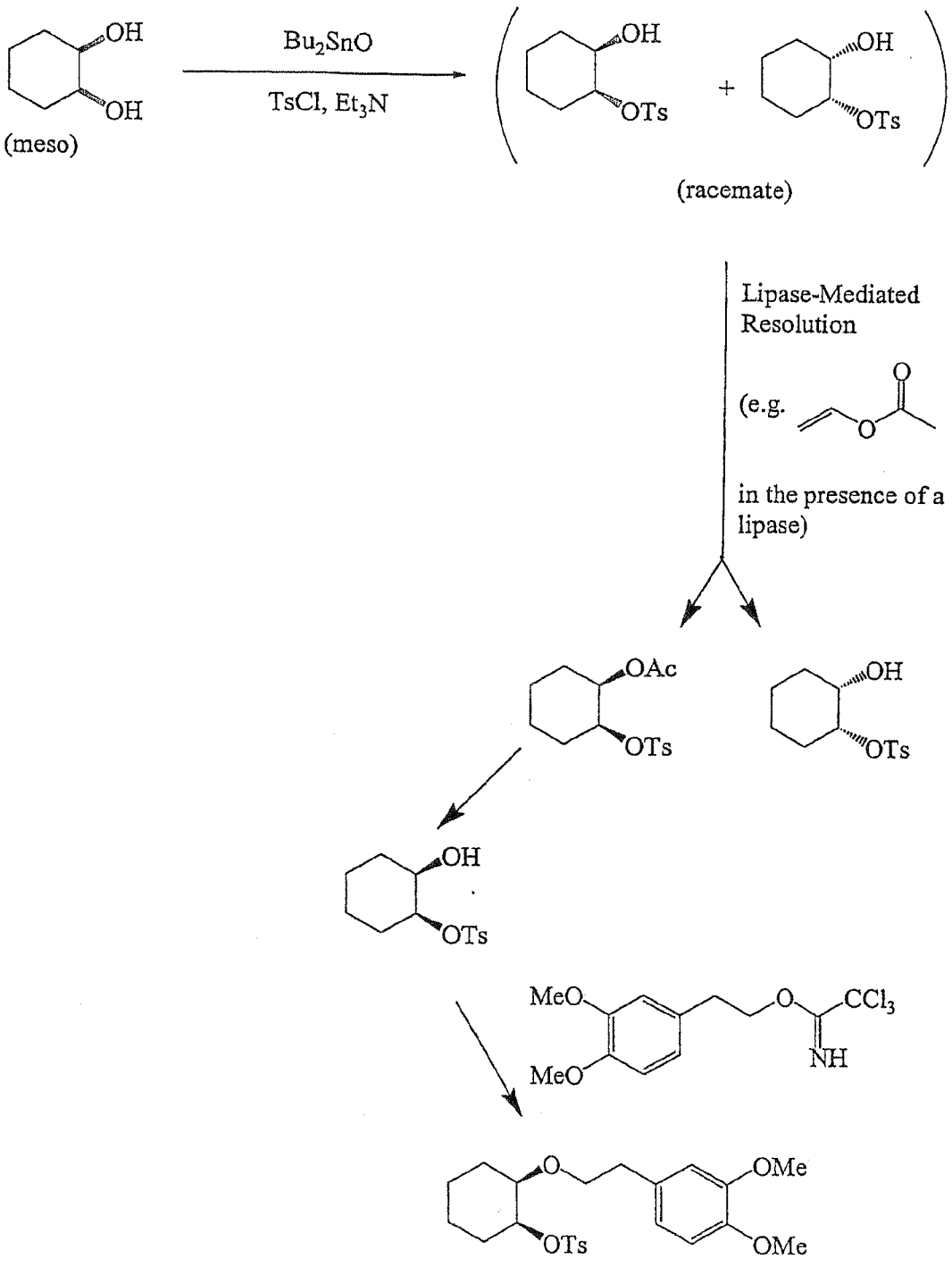

OH
OH
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OAc
OTs
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
O
OMe
OTs
OMe

Figure 99

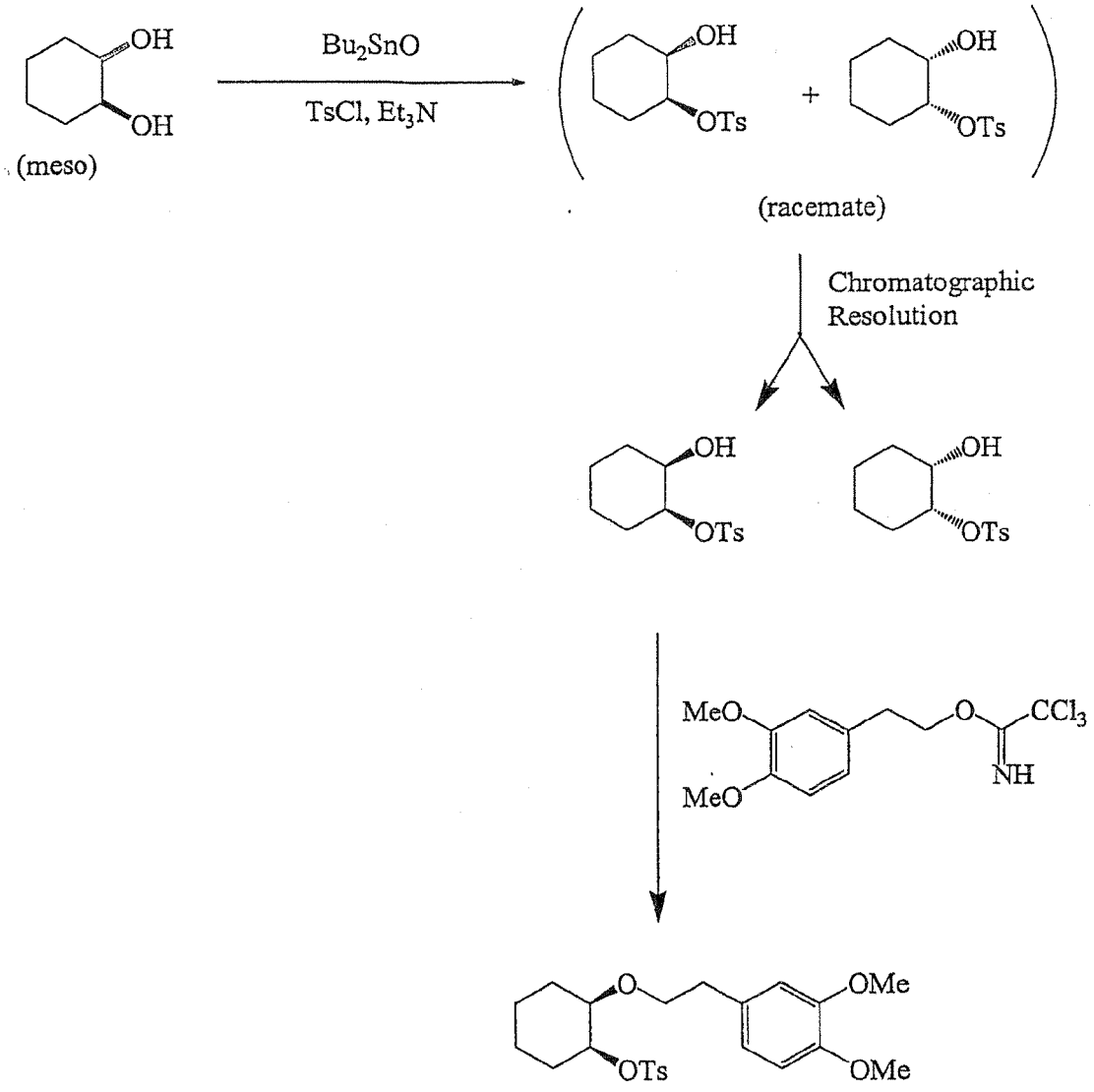

OH
OH
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
+
OH
OTs
(racemate)
Chromatographic
Resolution
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
O
OTs
OMe
OMe

Figure 100

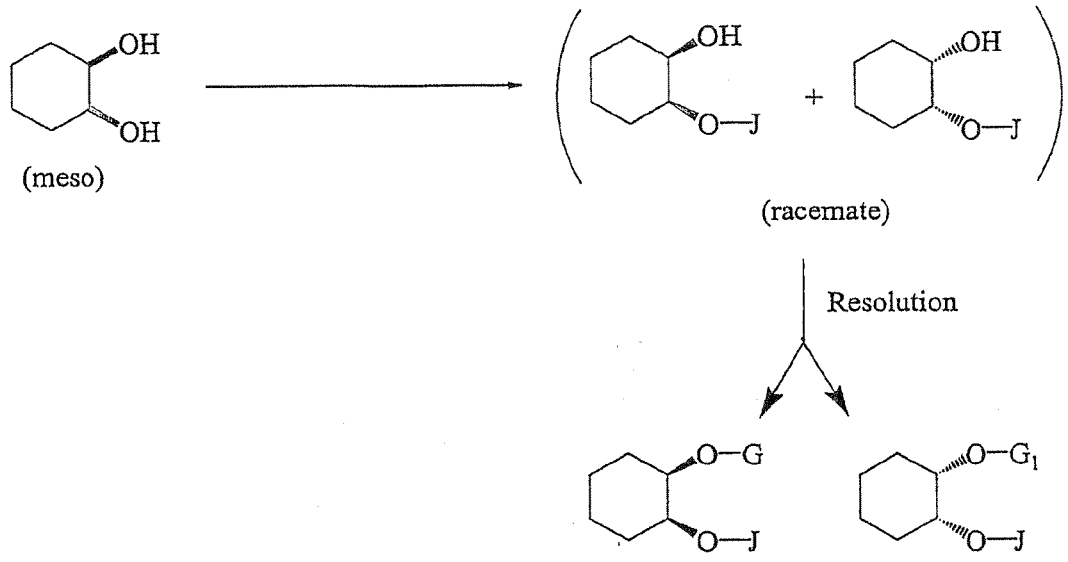


Figure 101

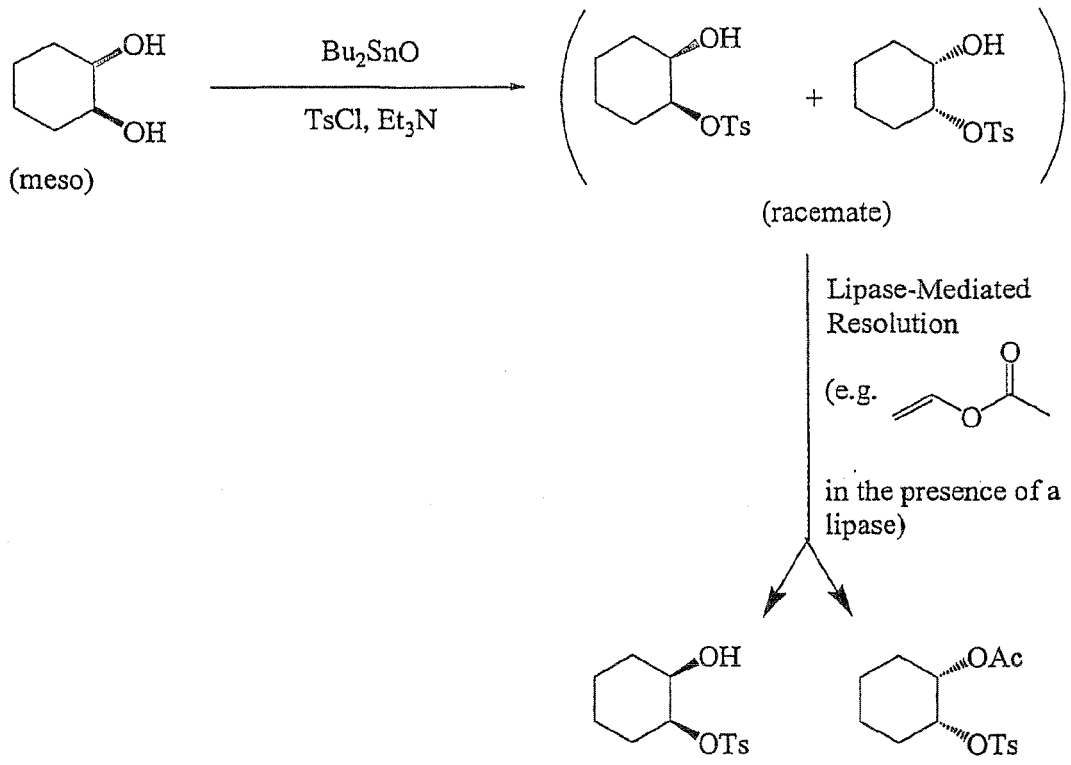

OH
OH
(meso)
Bu_2SnO
$TsCl, Et_3N$
OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OH
OTs
OAc
OTs

Figure 102

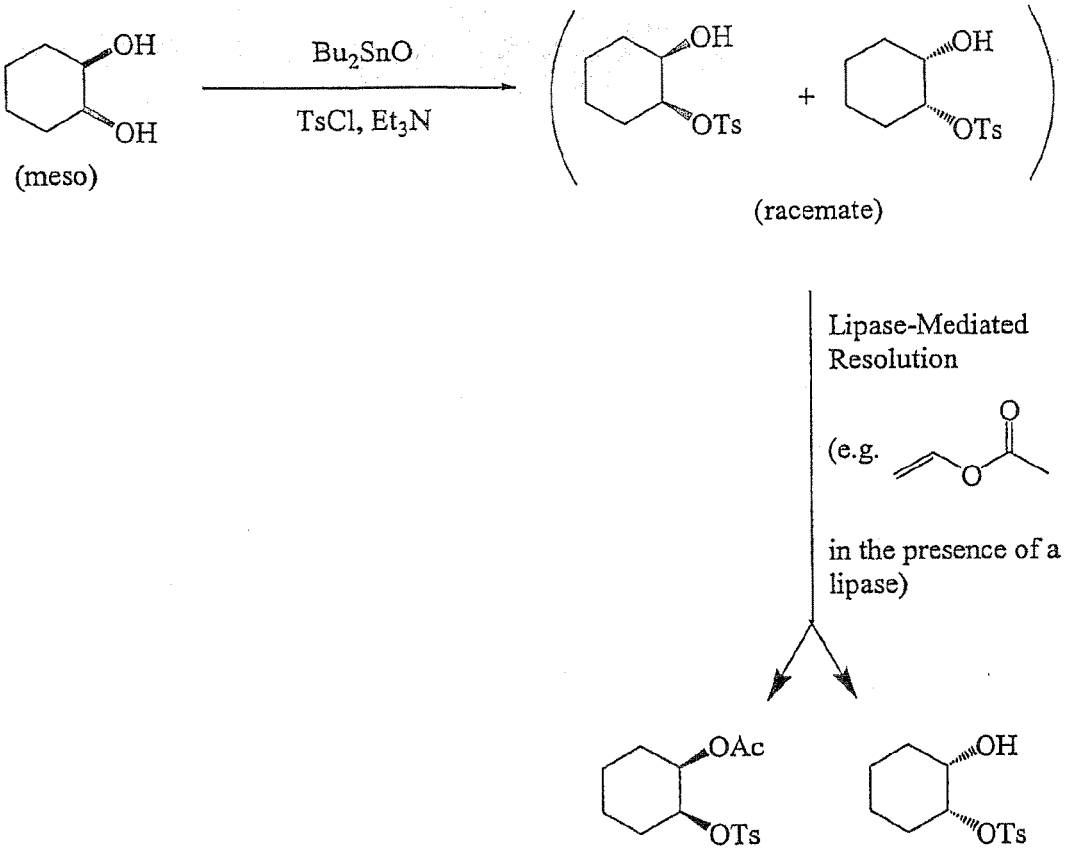

OH
OH
(meso)
Bu_2SnO
TsCl, Et_3N
OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OAc
OTs
OH
OTs

Figure 103

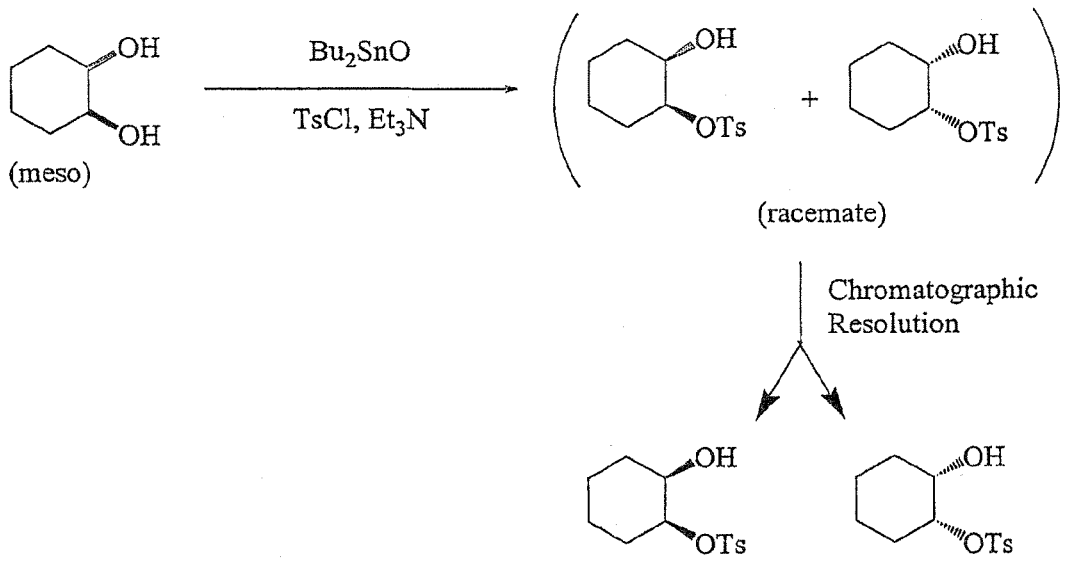

OH
OH
(meso)
Bu_2SnO
TsCl, Et_3N
OH
OTs
+
OH
OTs
(racemate)
Chromatographic
Resolution
OH
OTs
OH
OTs

Figure 104

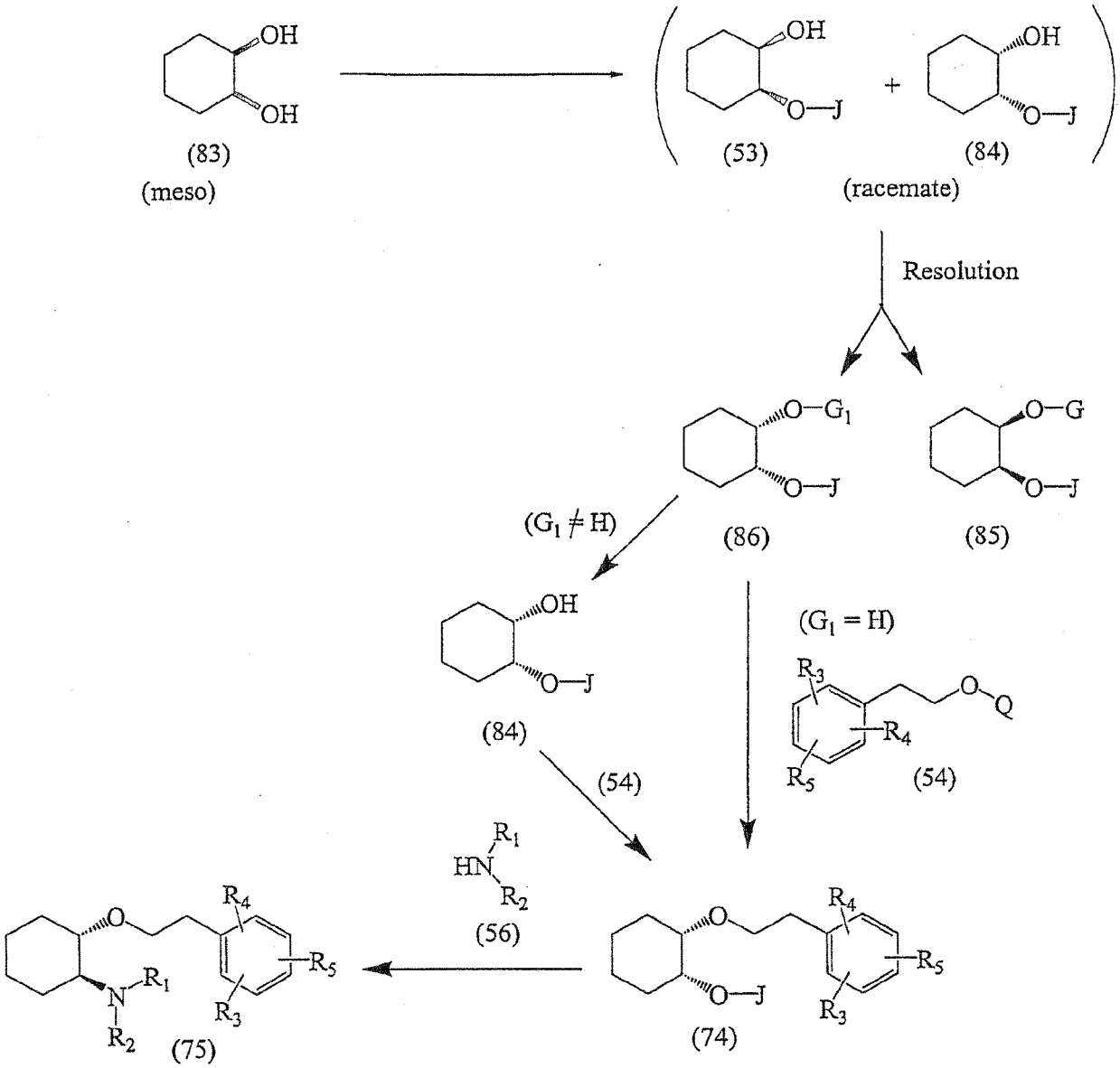

OH
OH
(83)
(meso)
OH
O—J
(53)
+
OH
O—J
(84)
(racemate)
Resolution
O—G1
O—J
(86)
O—G
O—J
(85)
(G1 ≠ H)
OH
O—J
(84)
(G1 = H)
R3
R4
R5
O—Q
(54)
(54)
R1
HN
R2
(56)
R4
O
R5
R3
O—J
(74)
R4
O
R1
N
R2
R5
R3
(75)

Figure 105

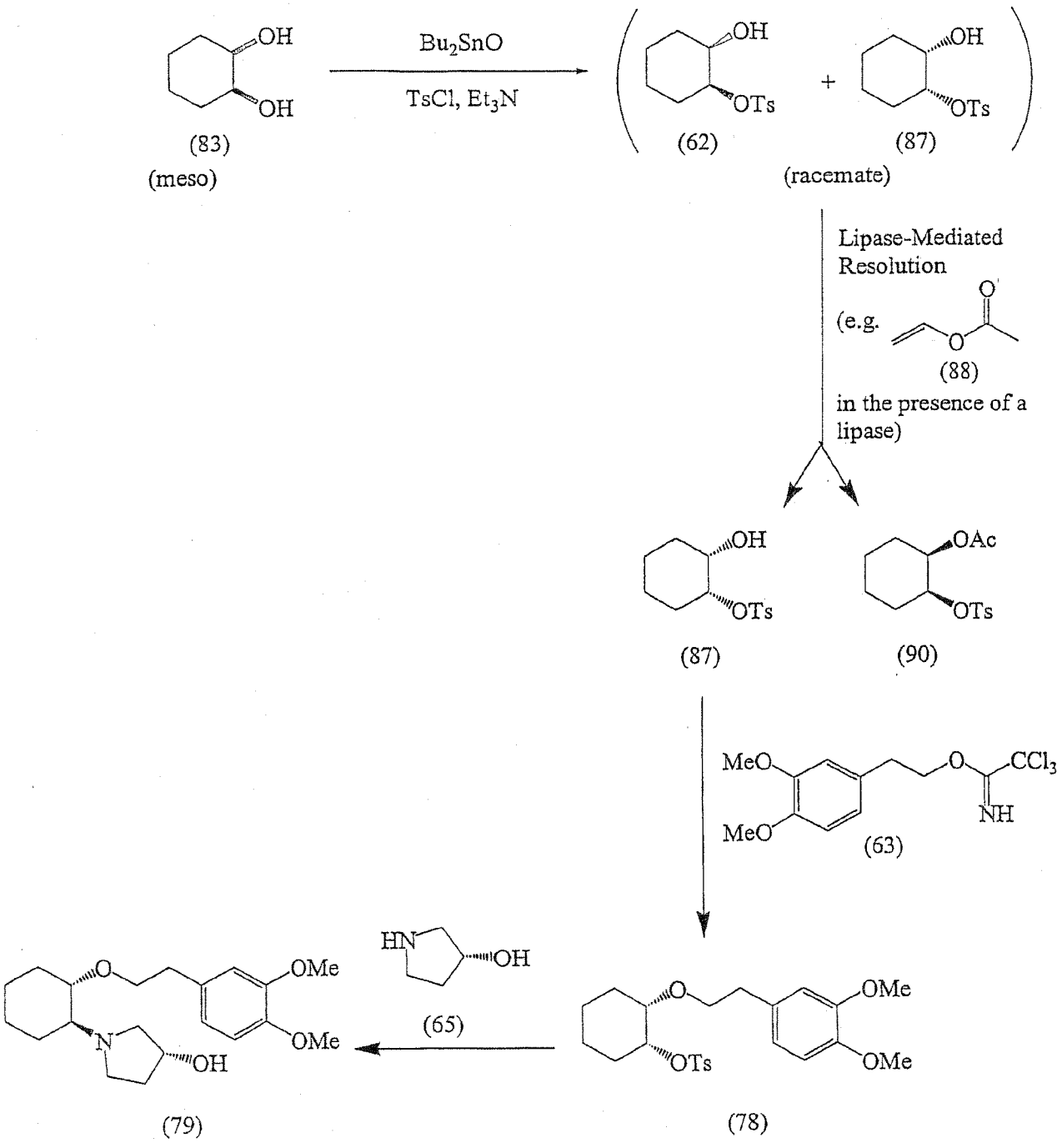

OH
OH
(83)
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
(62)
+
OH
OTs
(87)
(racemate)
Lipase-Mediated
Resolution
(e.g.
O
O
(88)
in the presence of a
lipase)
OH
OTs
(87)
OAc
OTs
(90)
MeO
MeO
O
CCl3
NH
(63)
HN
OH
(65)
O
OMe
OMe
N
OH
(79)
O
OMe
OMe
OTs
(78)

Figure 106

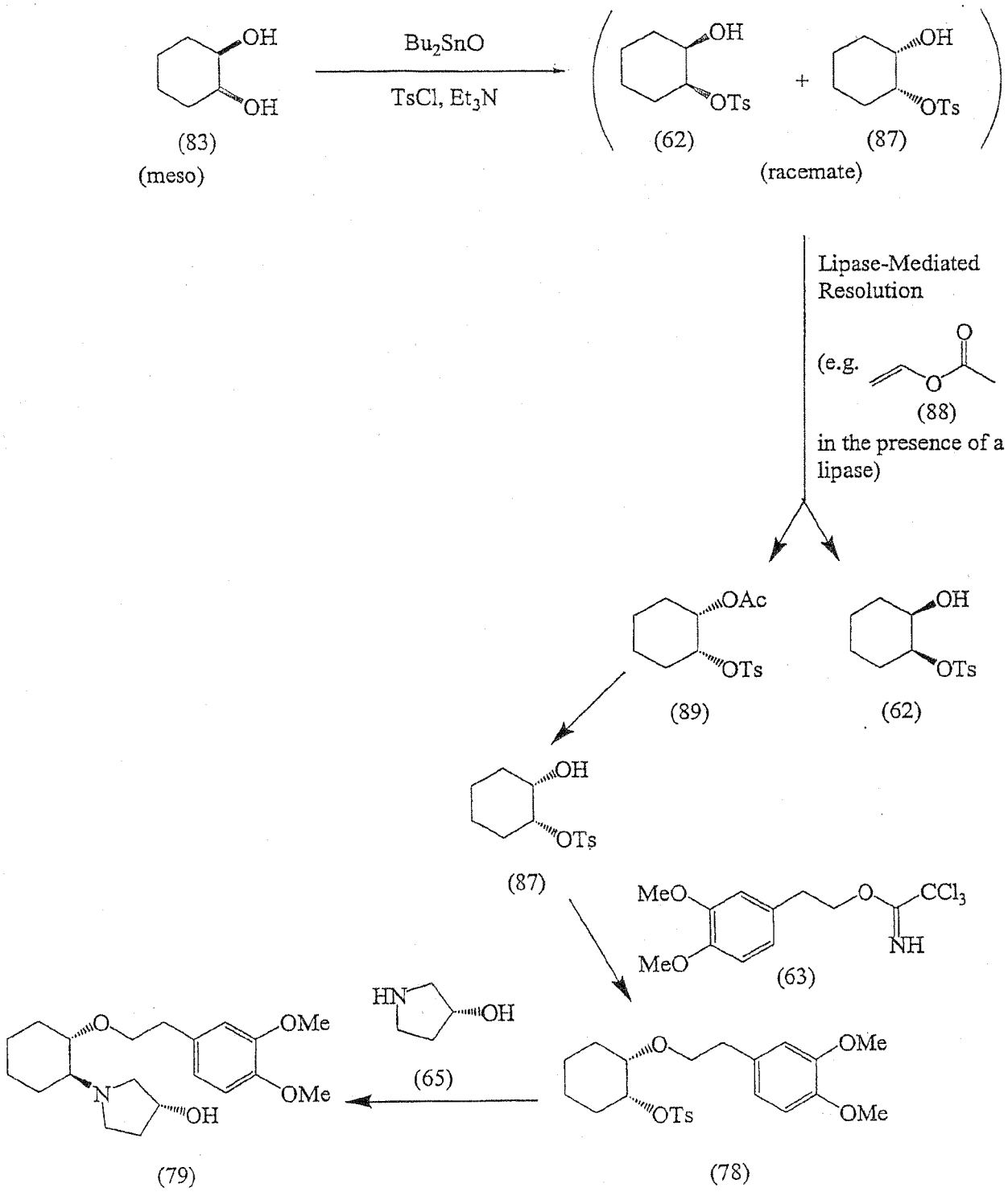

OH
OH
(83)
(meso)
Bu_2SnO
$TsCl, Et_3N$
OH
OTs
(62)
+
OH
OTs
(87)
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
(88)
in the presence of a lipase)
OAc
OTs
(89)
OH
OTs
(62)
OH
OTs
(87)
MeO
MeO
O
CCl_3
NH
(63)
HN
OH
(65)
O
OMe
OMe
N
OH
(79)
O
OTs
OMe
OMe
(78)

Figure 107

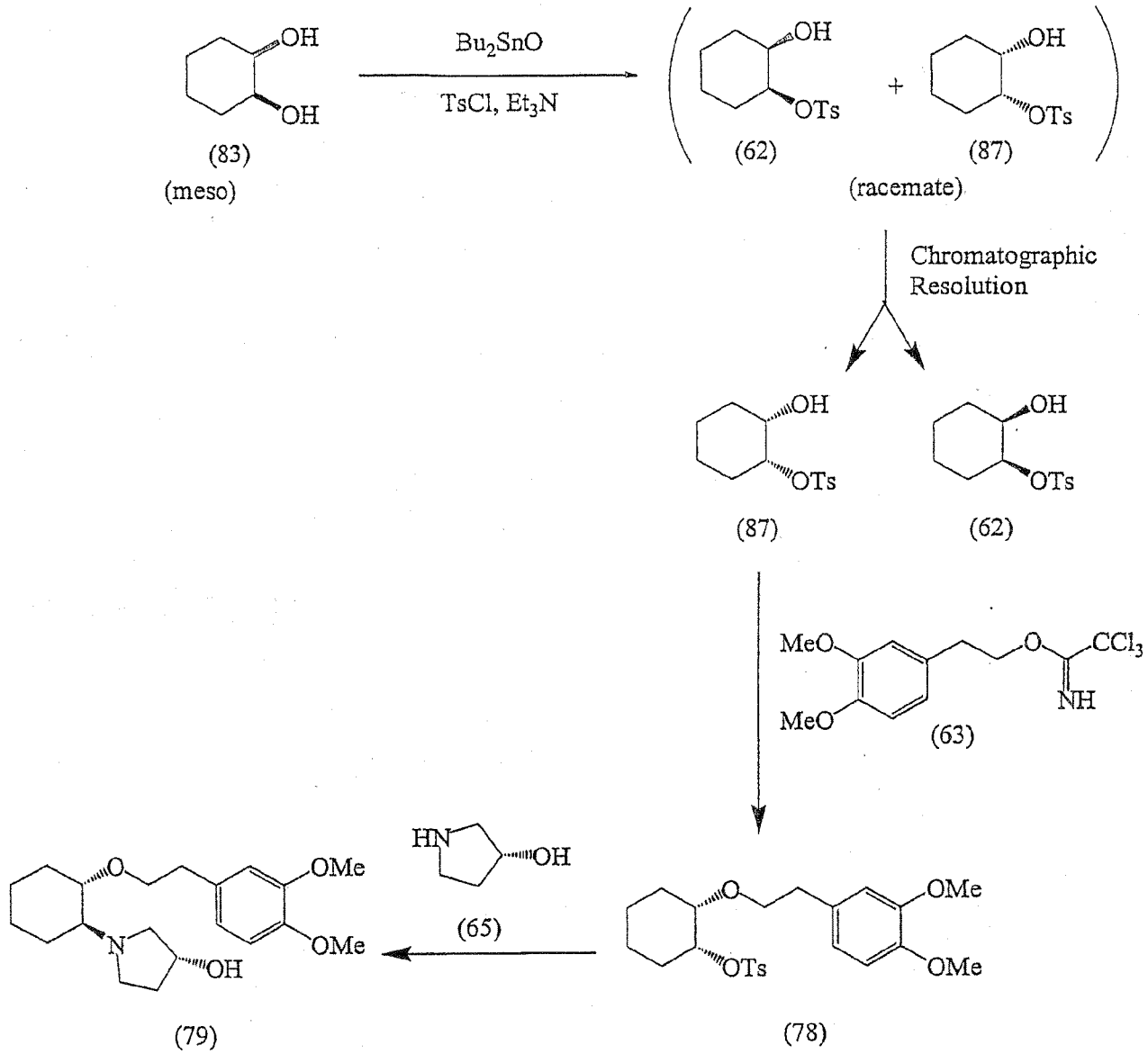

OH
OH
(83)
(meso)
Bu_2SnO
TsCl, Et_3N
OH
OTs
(62)
+
OH
OTs
(87)
(racemate)
Chromatographic Resolution
OH
OTs
(87)
OH
OTs
(62)
MeO
MeO
O
CCl_3
NH
(63)
HN
OH
(65)
O
OMe
OMe
N
OH
(79)
O
OMe
OMe
OTs
(78)

Figure 108

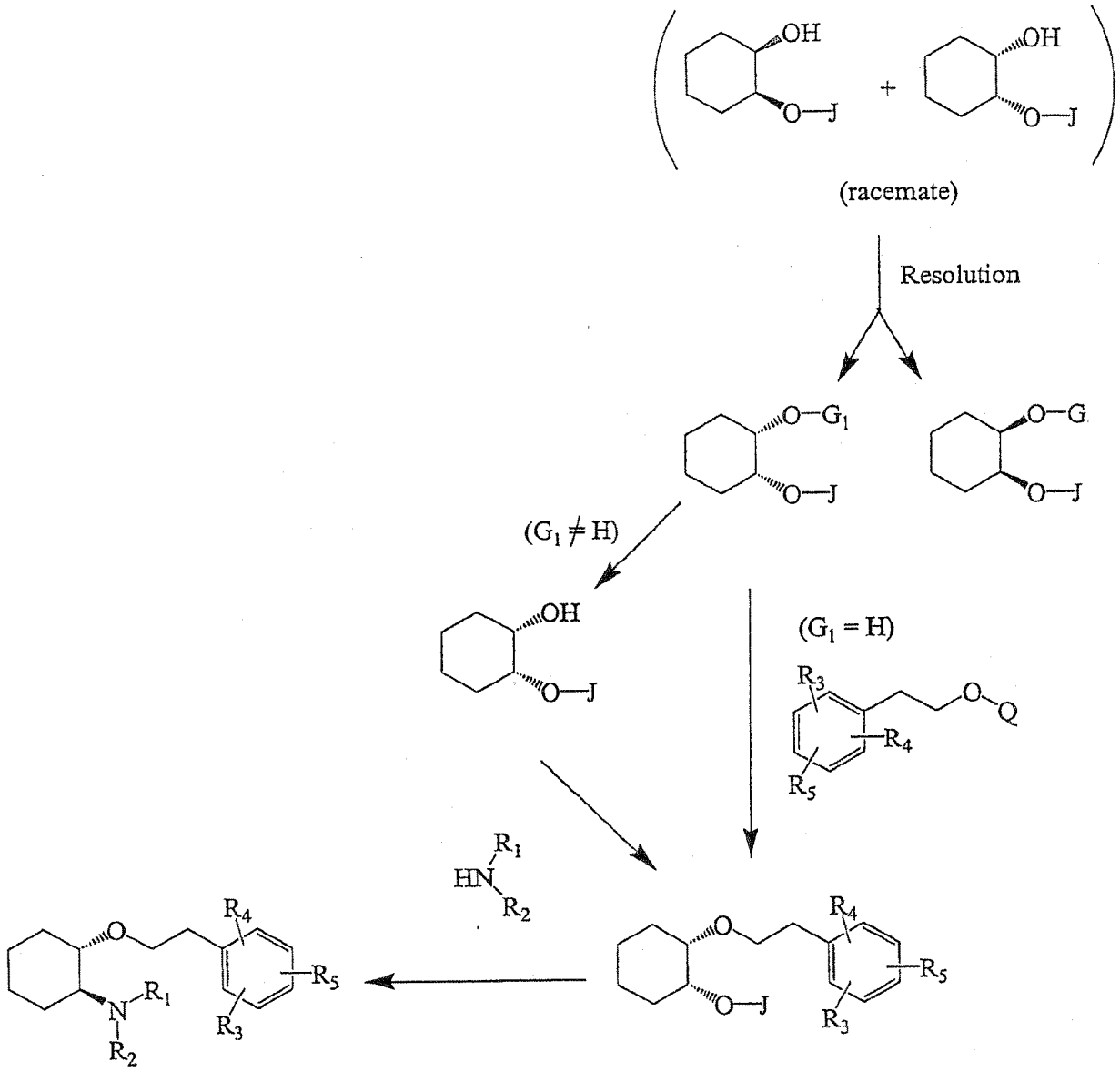

OH
O—J
+
OH
O—J
(racemate)
Resolution
O—G1
O—J
O—G
O—J
(G1 ≠ H)
OH
O—J
(G1 = H)
R3
O
Q
R4
R5
R1
HN
R2
R4
O
R5
N
R1
R2
R3
O—J
R4
R5
R3

Figure 109

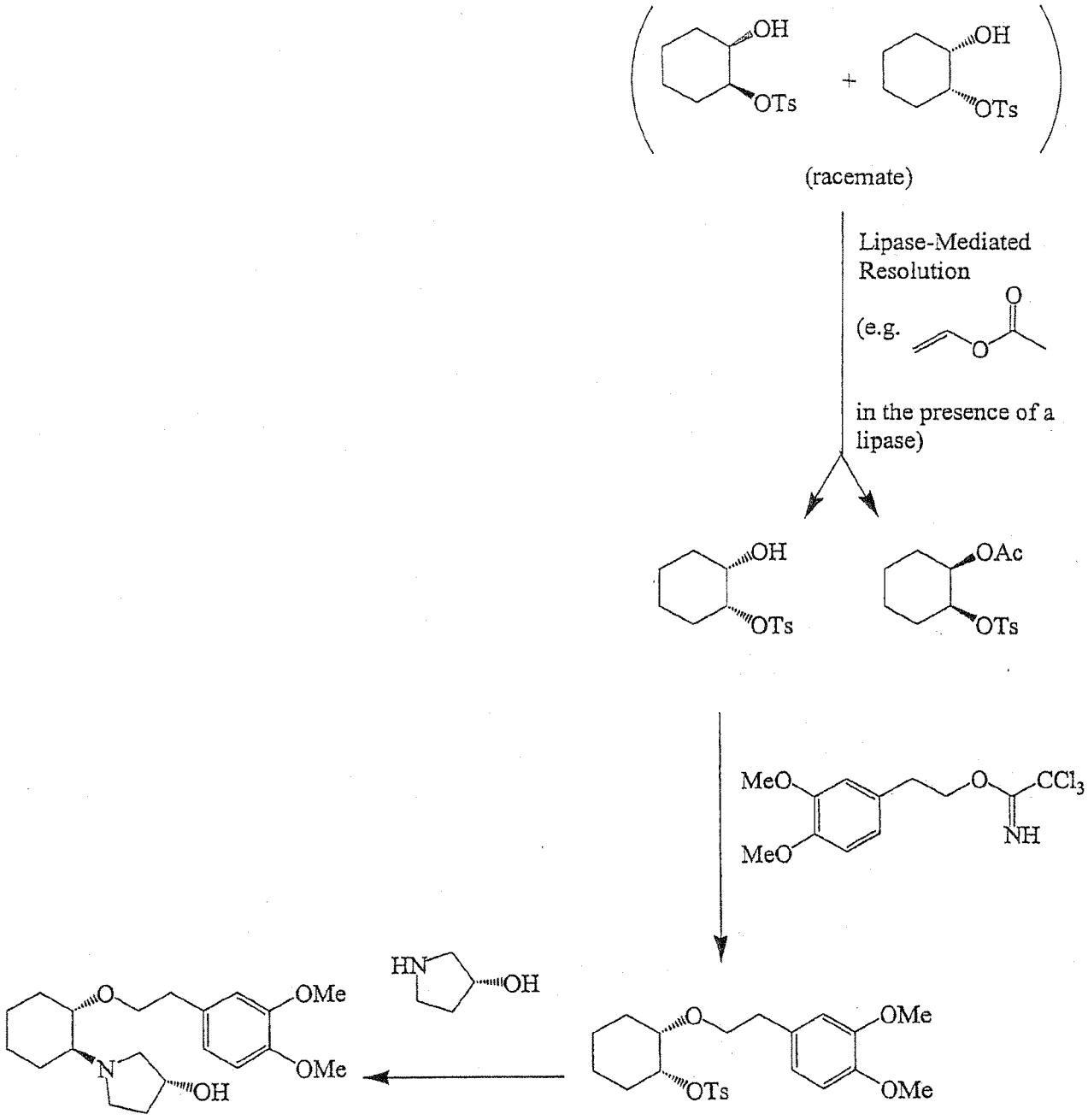

OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OH
OTs
OAc
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OMe
OMe
OTs

Figure 110

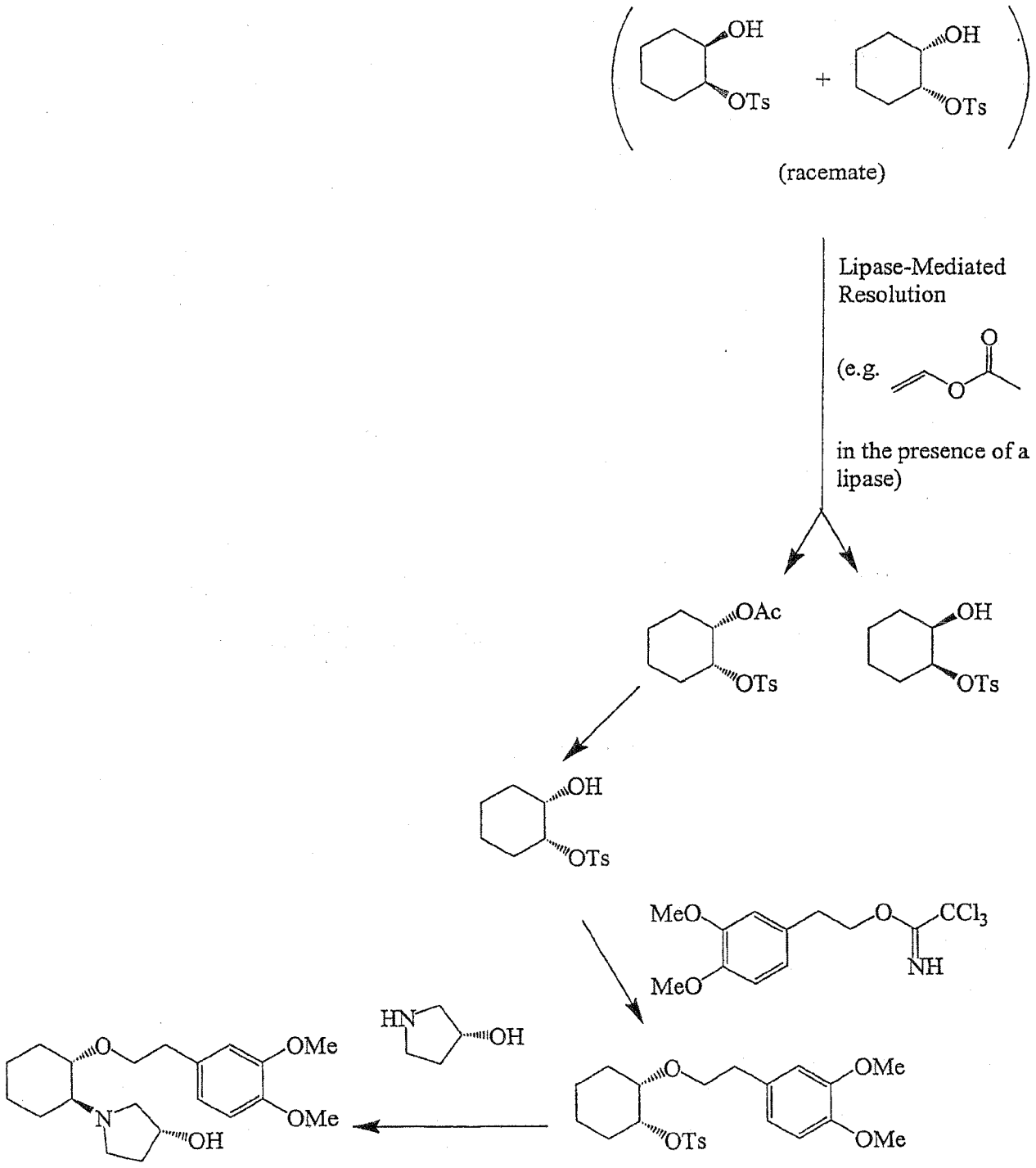

OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OAc
OTs
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OMe
OMe
OTs

Figure 111

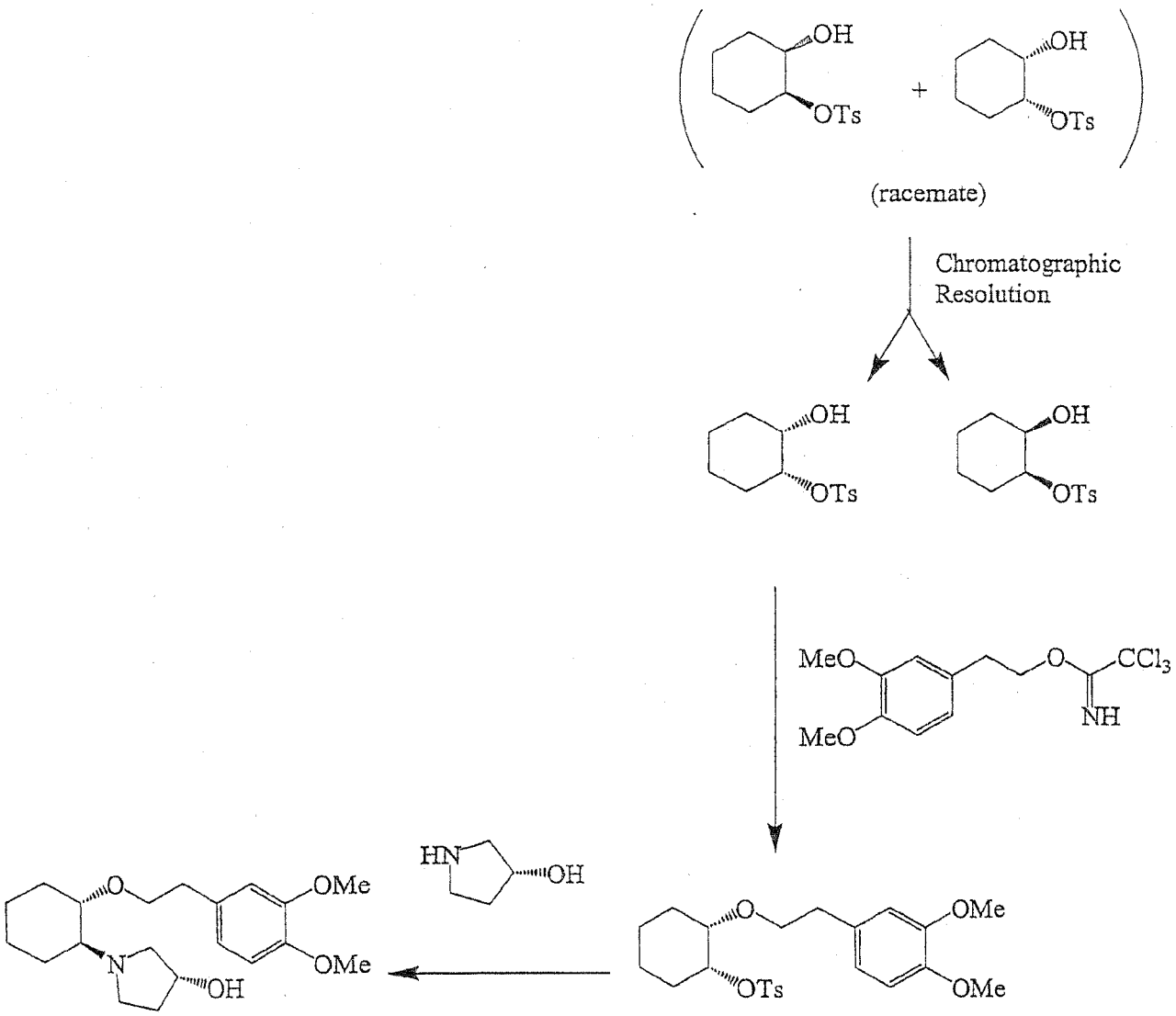

OH
OTs
+
OH
OTs
(racemate)
Chromatographic
Resolution
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OMe
OMe
OTs

Figure 112

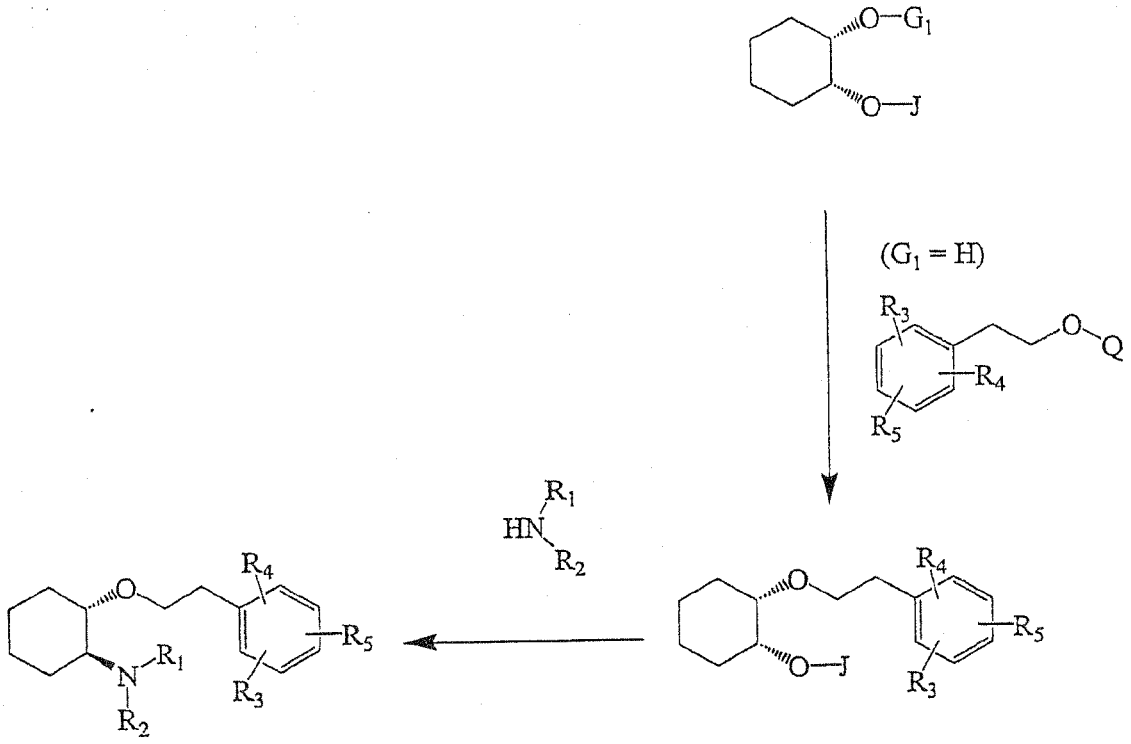


Figure 113

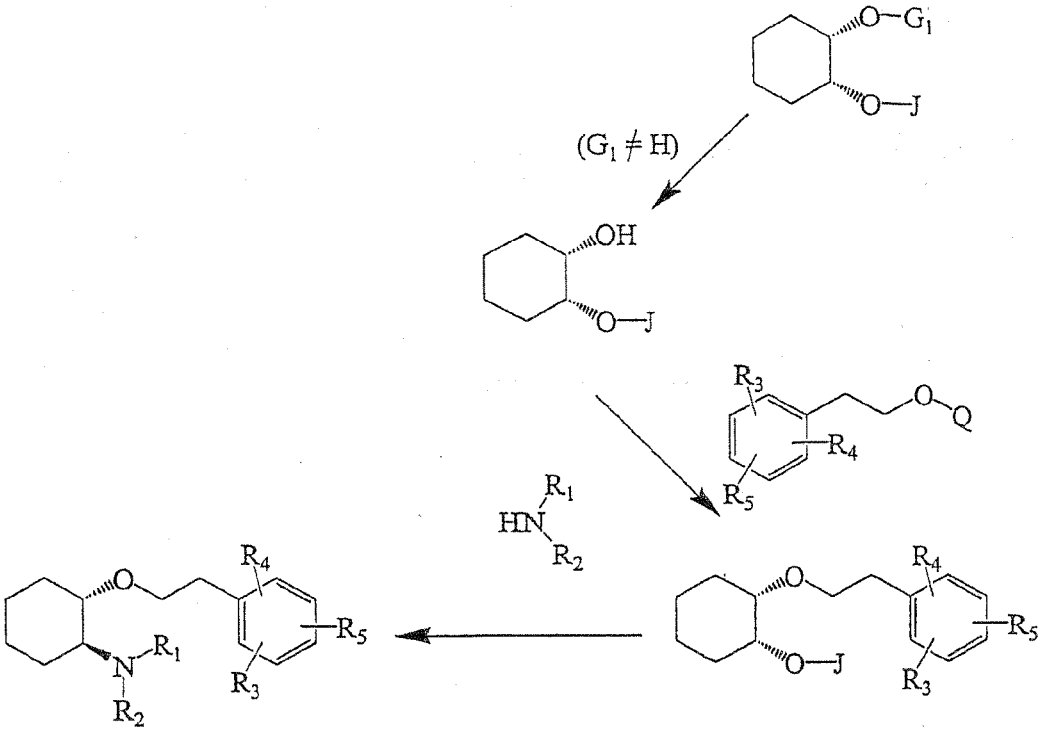


Figure 114

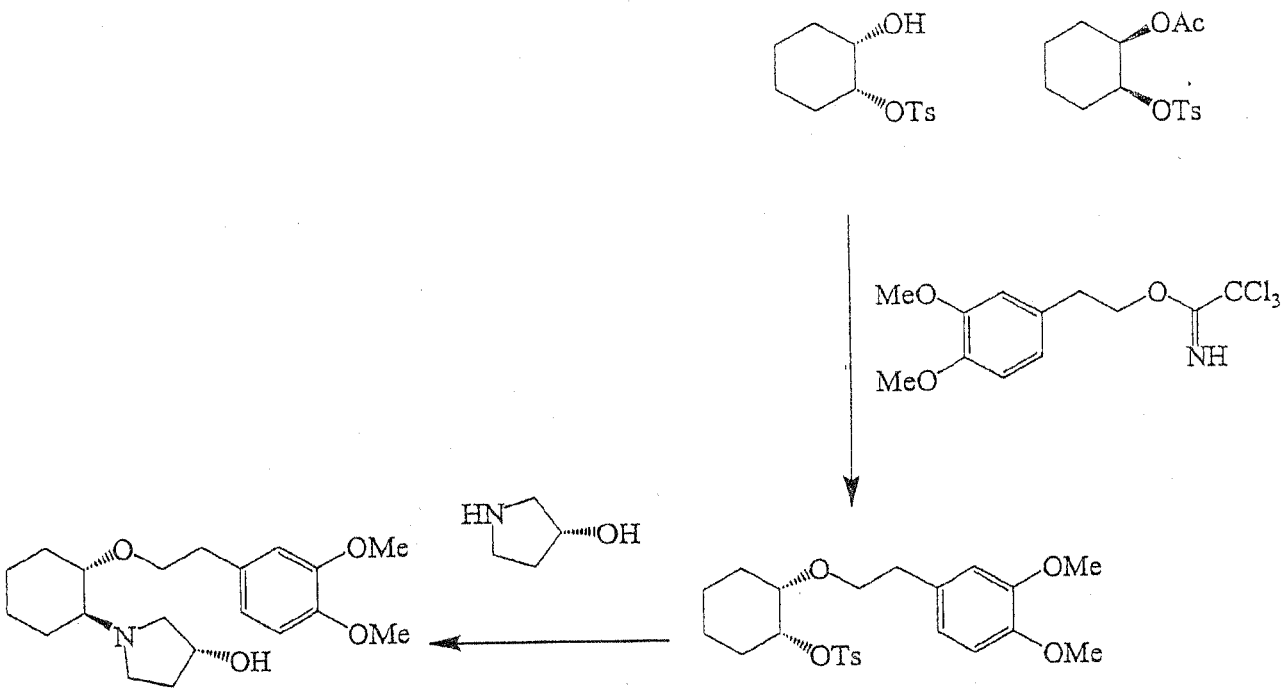


Figure 115

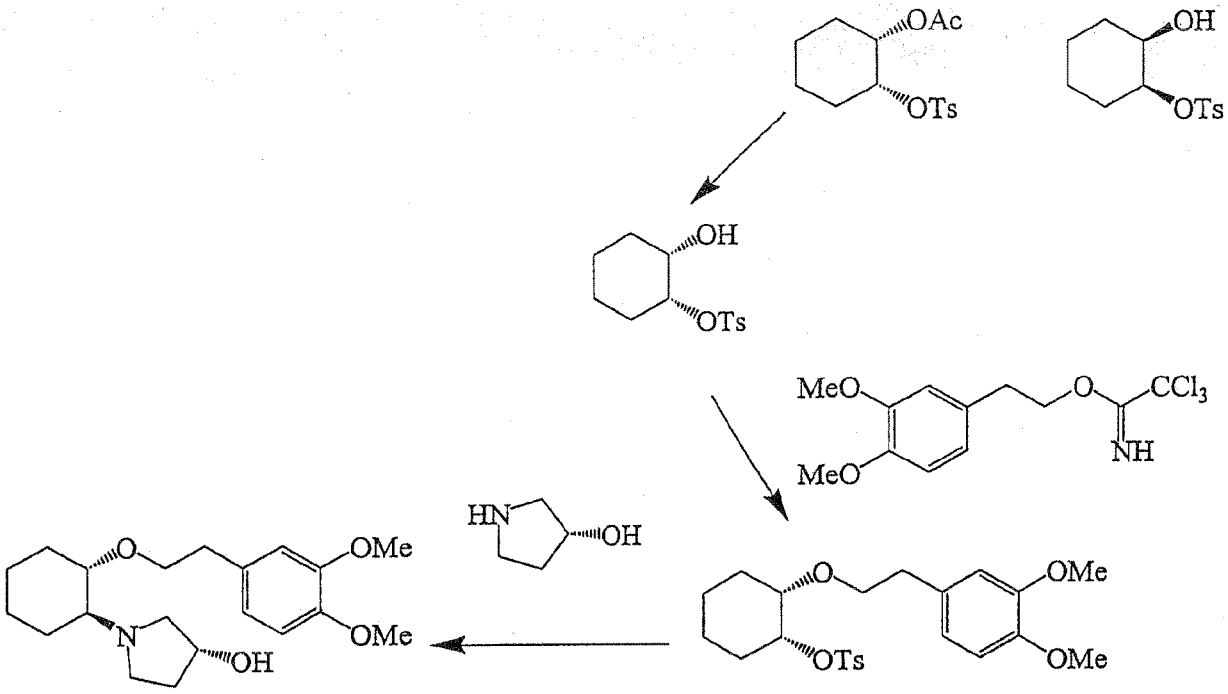

OAc
OTs
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
HN
OH
O
OMe
OMe
N
OH
O
OTs
OMe
OMe

Figure 116

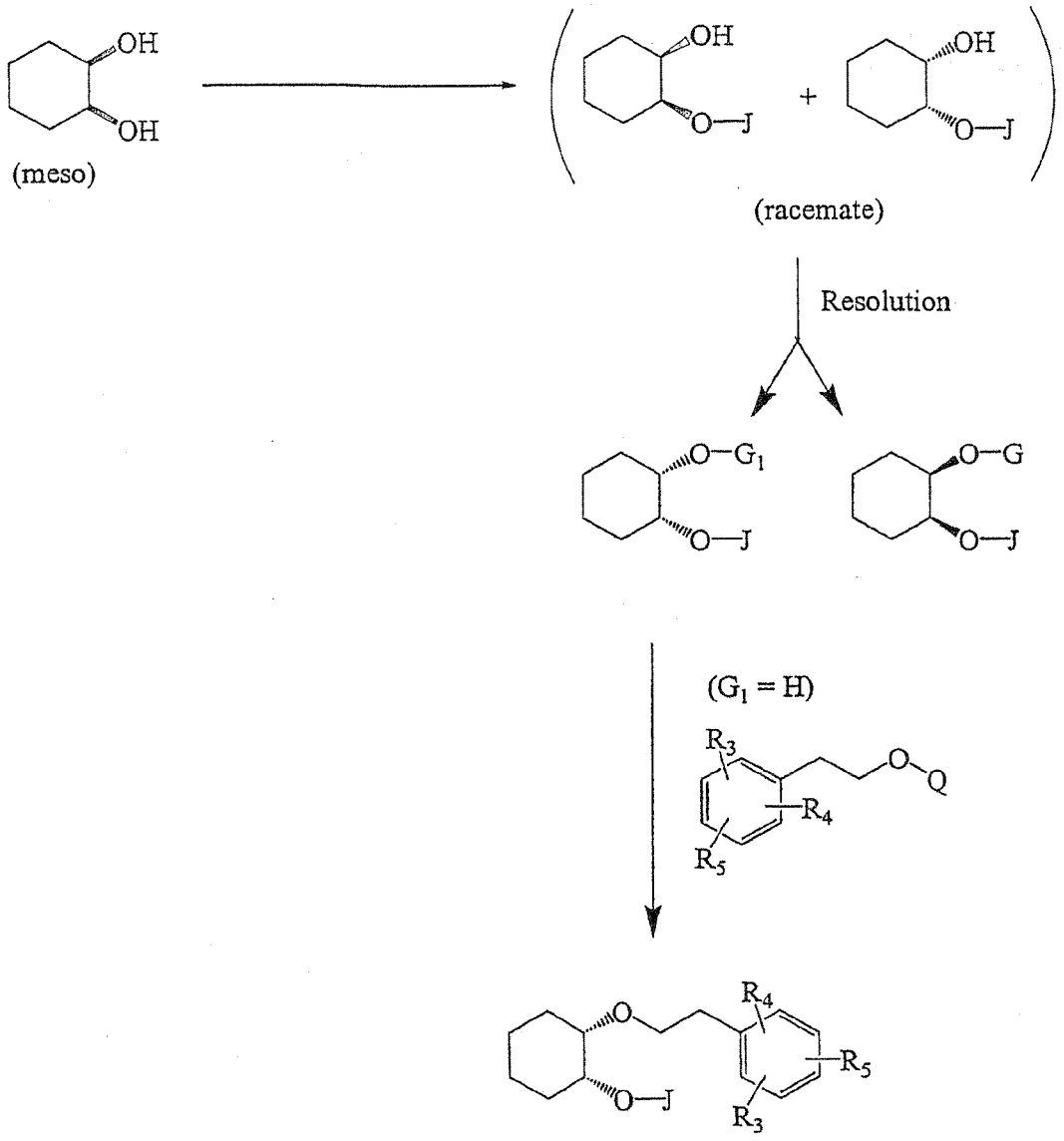

OH
OH
(meso)
OH
O—J
+
OH
O—J
(racemate)
Resolution
O—G1
O—J
O—G
O—J
(G1 = H)
R3
O
Q
R4
R5
R4
O
R5
O—J
R3

Figure 117

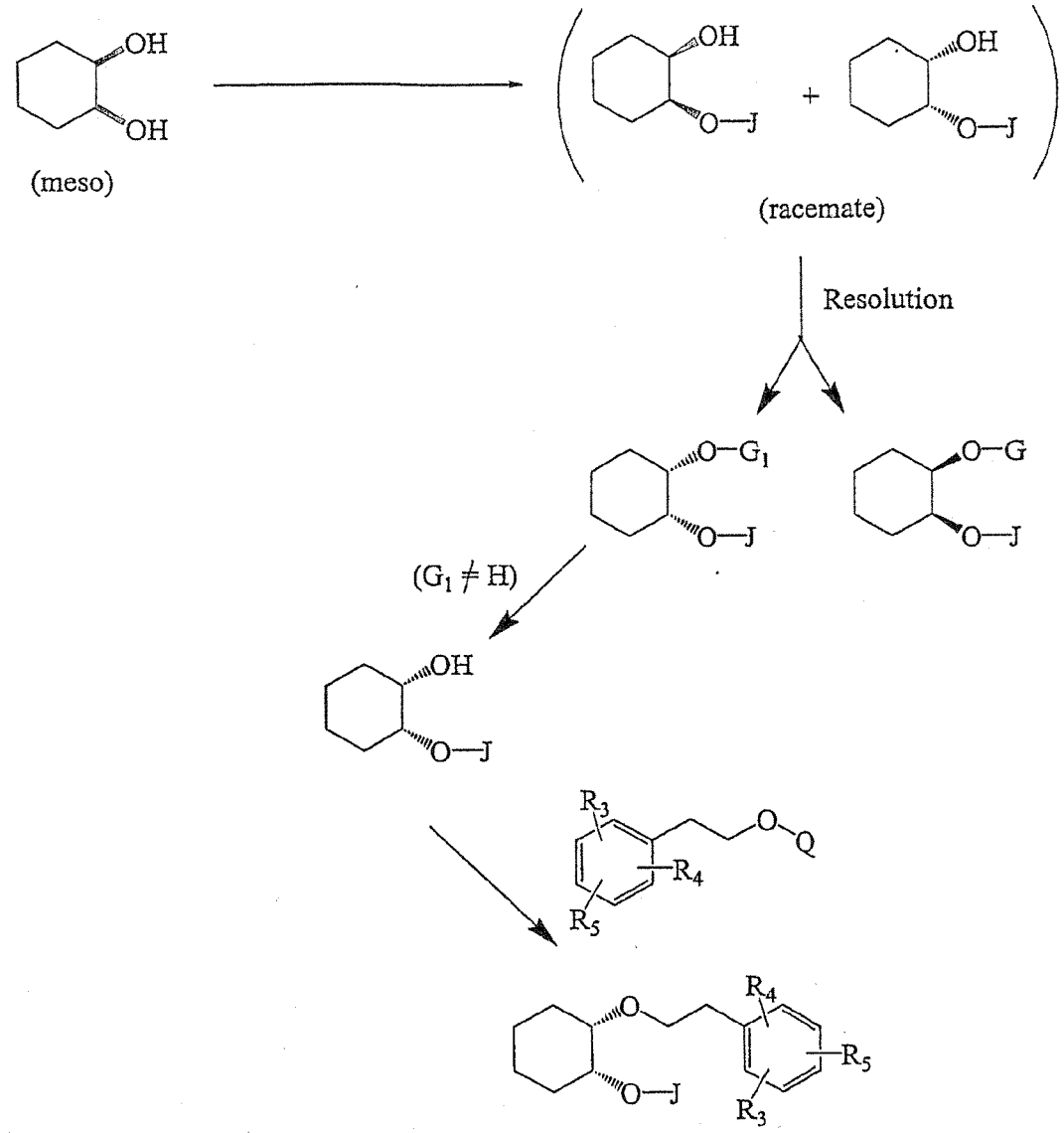

OH
OH
(meso)
OH
O—J
+
OH
O—J
(racemate)
Resolution
O—G1
O—J
O—G
O—J
(G1 ≠ H)
OH
O—J
R3
O
Q
R4
R5
R4
O
R5
O—J
R3

Figure 118

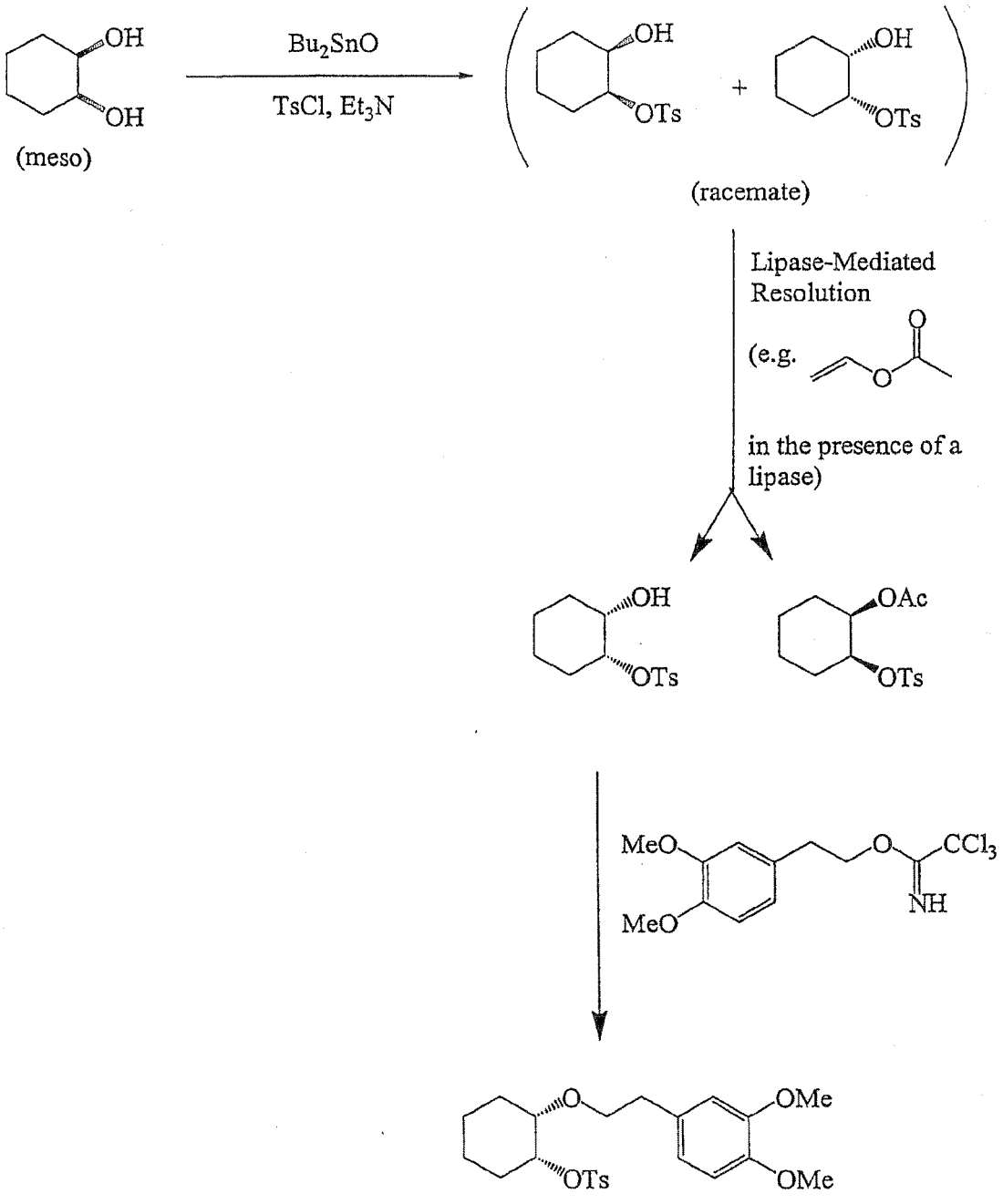

OH
OH
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated
Resolution
(e.g.
O
O
in the presence of a
lipase)
OH
OTs
OAc
OTs
MeO
MeO
O
CCl3
NH
O
OTs
OMe
OMe

Figure 119

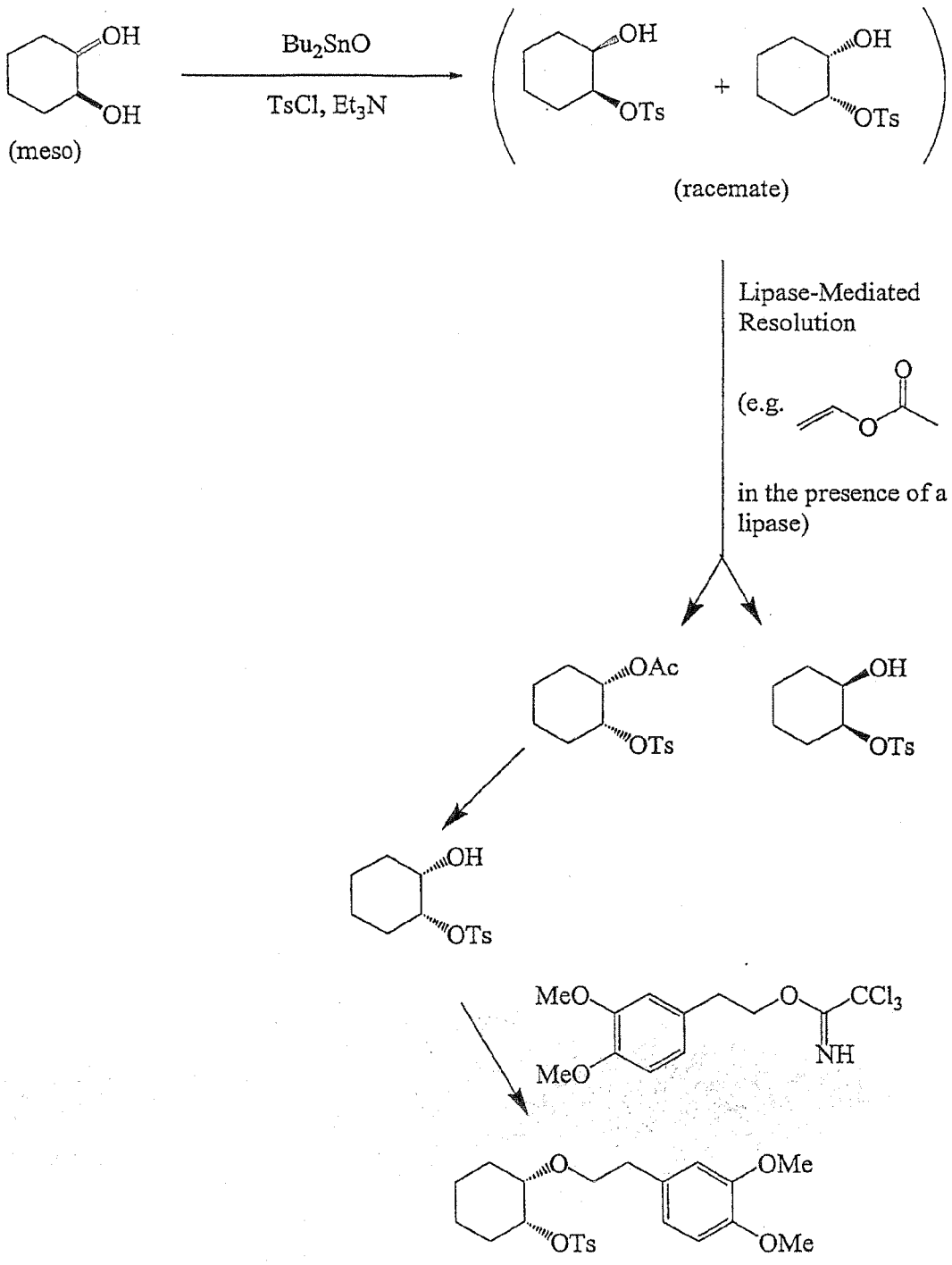

OH
OH
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
+
OH
OTs
(racemate)
Lipase-Mediated Resolution
(e.g.
O
O
in the presence of a lipase)
OAc
OTs
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
O
OTs
OMe
OMe

Figure 120

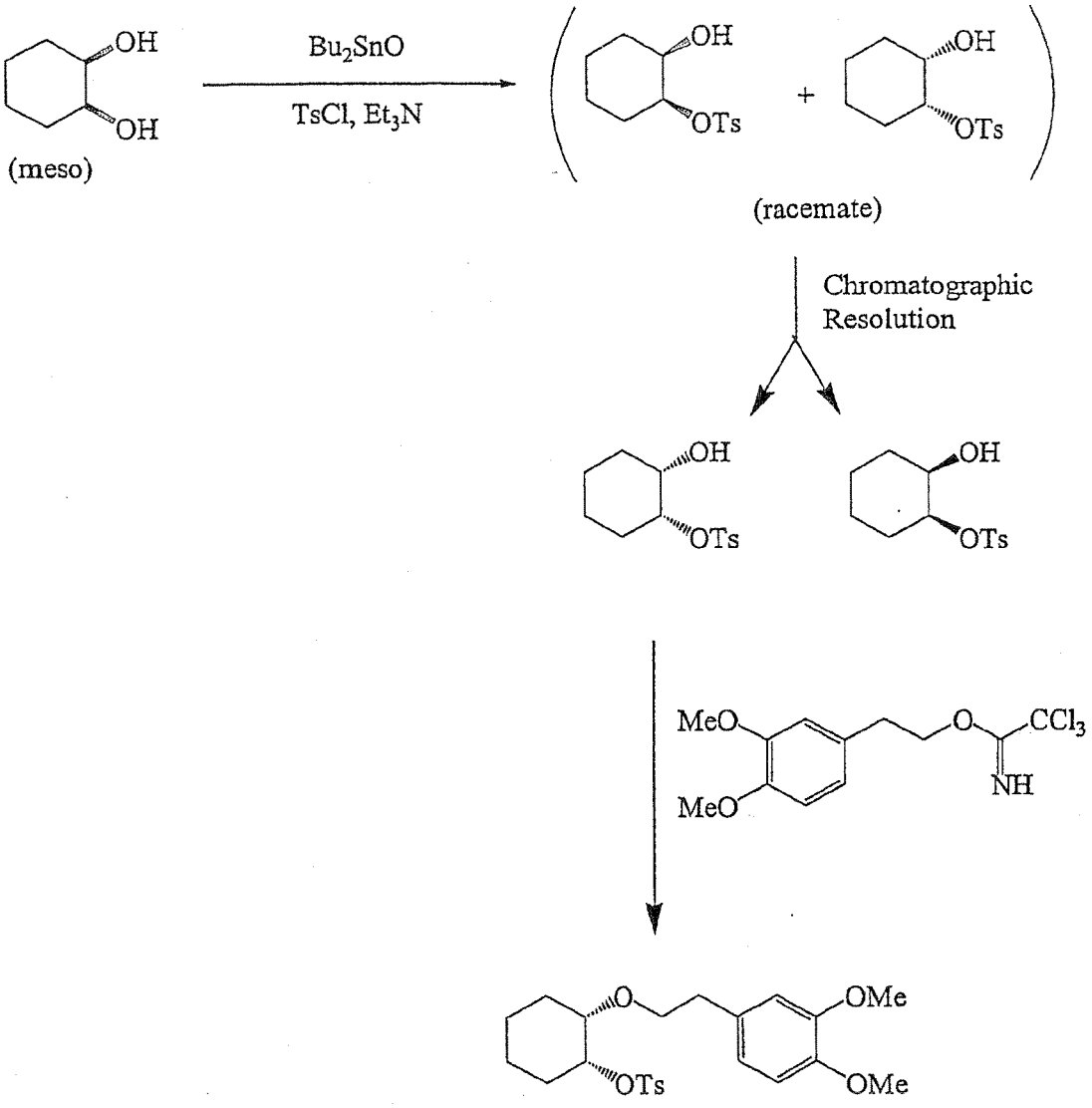

OH
OH
(meso)
Bu2SnO
TsCl, Et3N
OH
OTs
+
OH
OTs
(racemate)
Chromatographic
Resolution
OH
OTs
OH
OTs
MeO
MeO
O
CCl3
NH
O
OTs
OMe
OMe

Figure 121

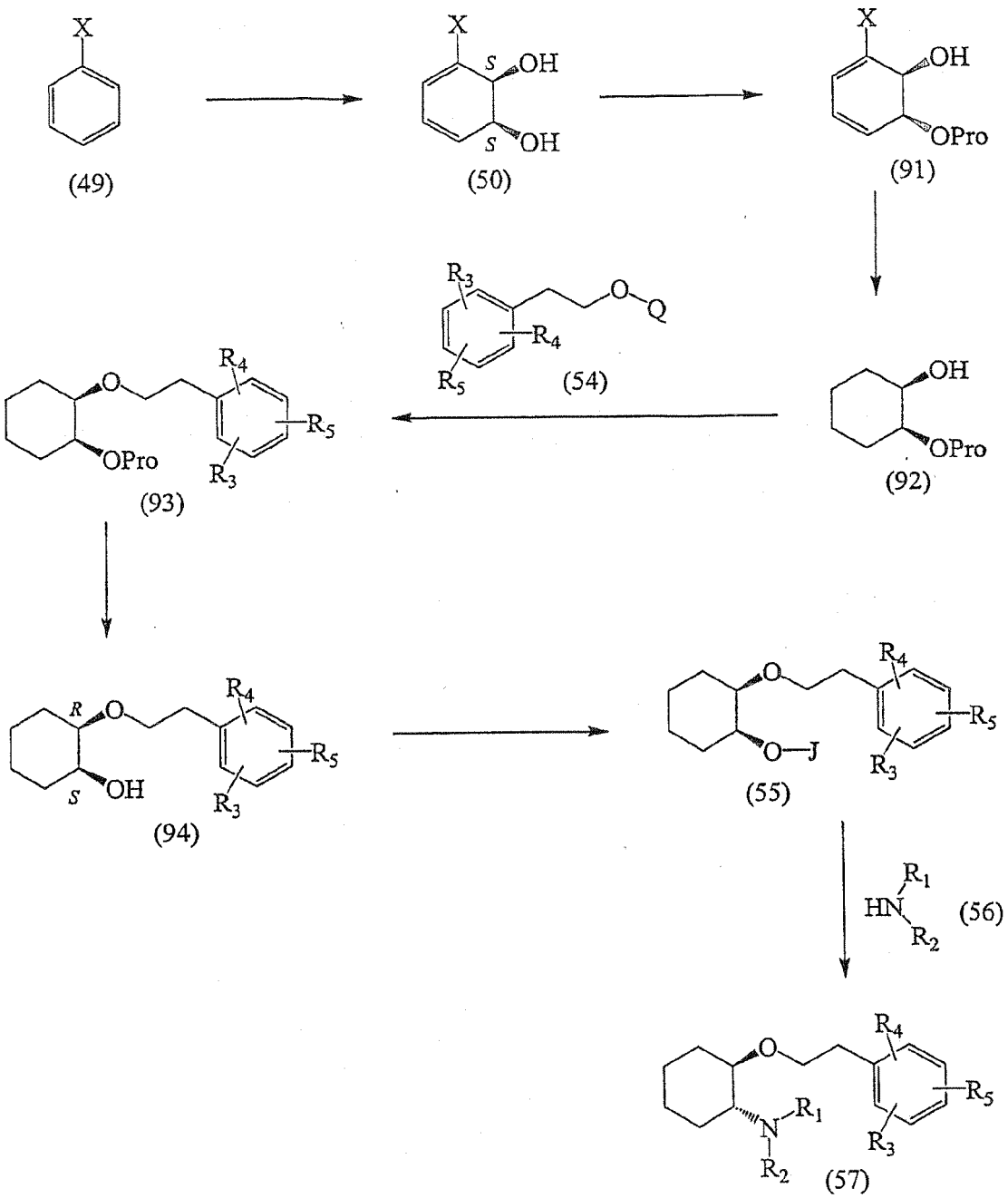

X
(49)
X
S
OH
S
OH
(50)
X
OH
OPro
(91)
OH
OPro
(92)
R3
O
Q
R4
R5
(54)
R4
O
R5
OPro
R3
(93)
R
O
R4
S
OH
R5
R3
(94)
O
R4
O—J
R5
R3
(55)
R1
HN
R2
(56)
R4
O
R5
N
R1
R2
R3
(57)

Figure 122

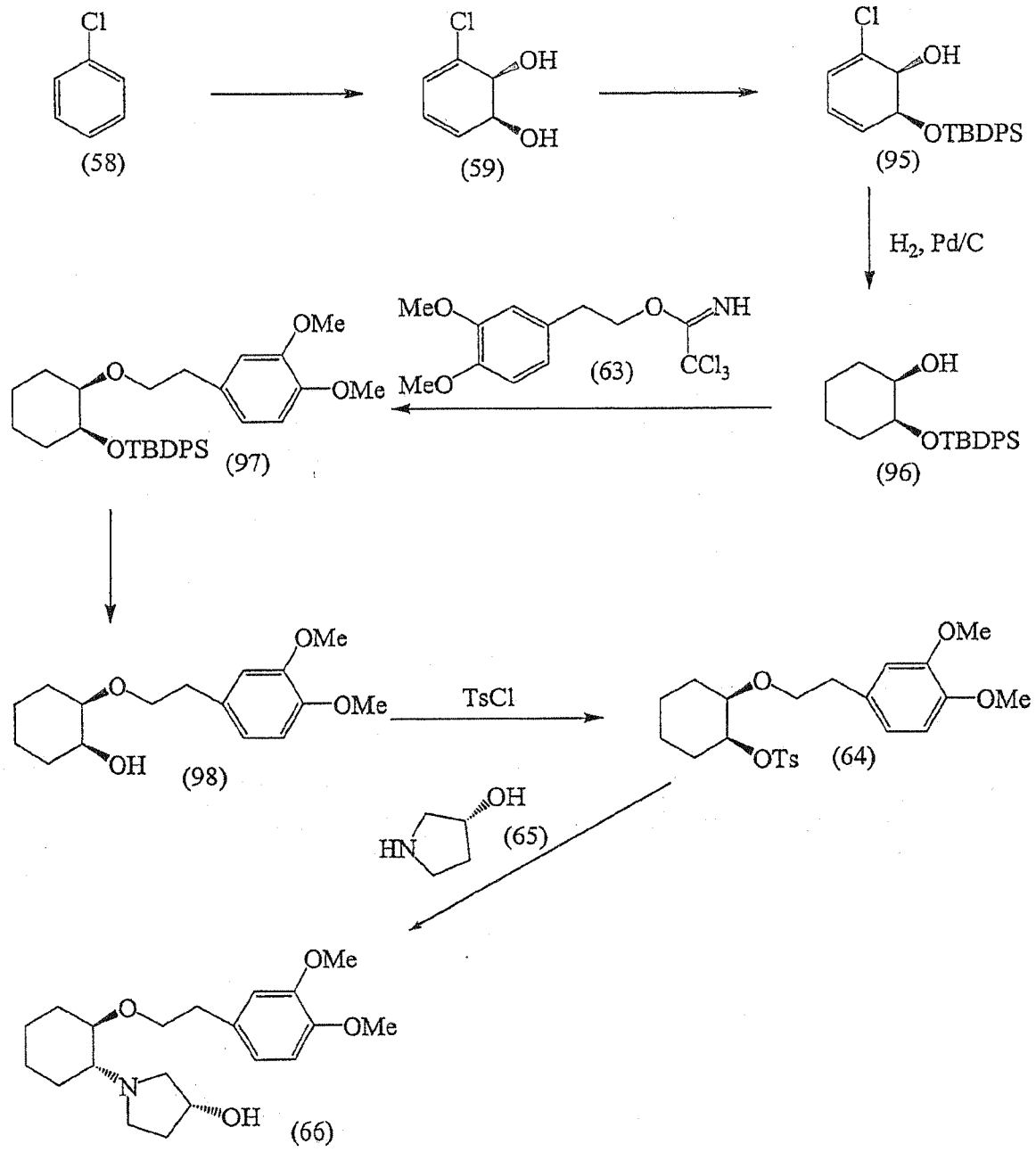

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OTBDPS
(95)
H_2, Pd/C
OH
OTBDPS
(96)
MeO
O
NH
MeO
(63)
CCl_3
OMe
O
OMe
OTBDPS
(97)
OMe
O
OMe
OH
(98)
TsCl
OMe
O
OMe
OTs
(64)
OH
HN
(65)
OMe
O
OMe
N
OH
(66)

Figure 123

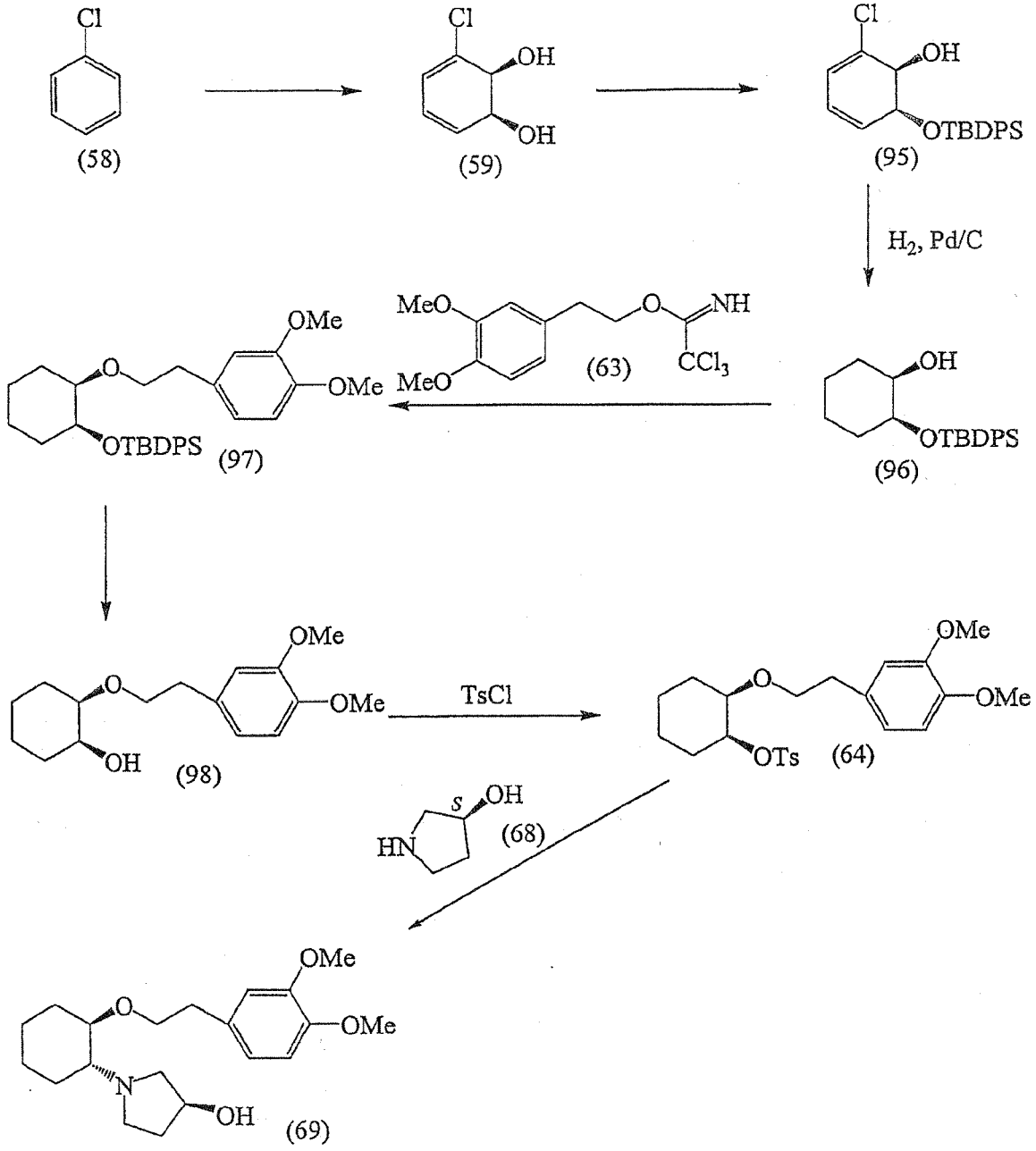

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OTBDPS
(95)
H_2, Pd/C
OH
OTBDPS
(96)
MeO
MeO
O
NH
CCl_3
(63)
OMe
OMe
O
OTBDPS
(97)
OMe
OMe
O
OH
(98)
TsCl
OMe
OMe
O
OTs
(64)
S
OH
HN
(68)
OMe
OMe
O
N
OH
(69)

Figure 124

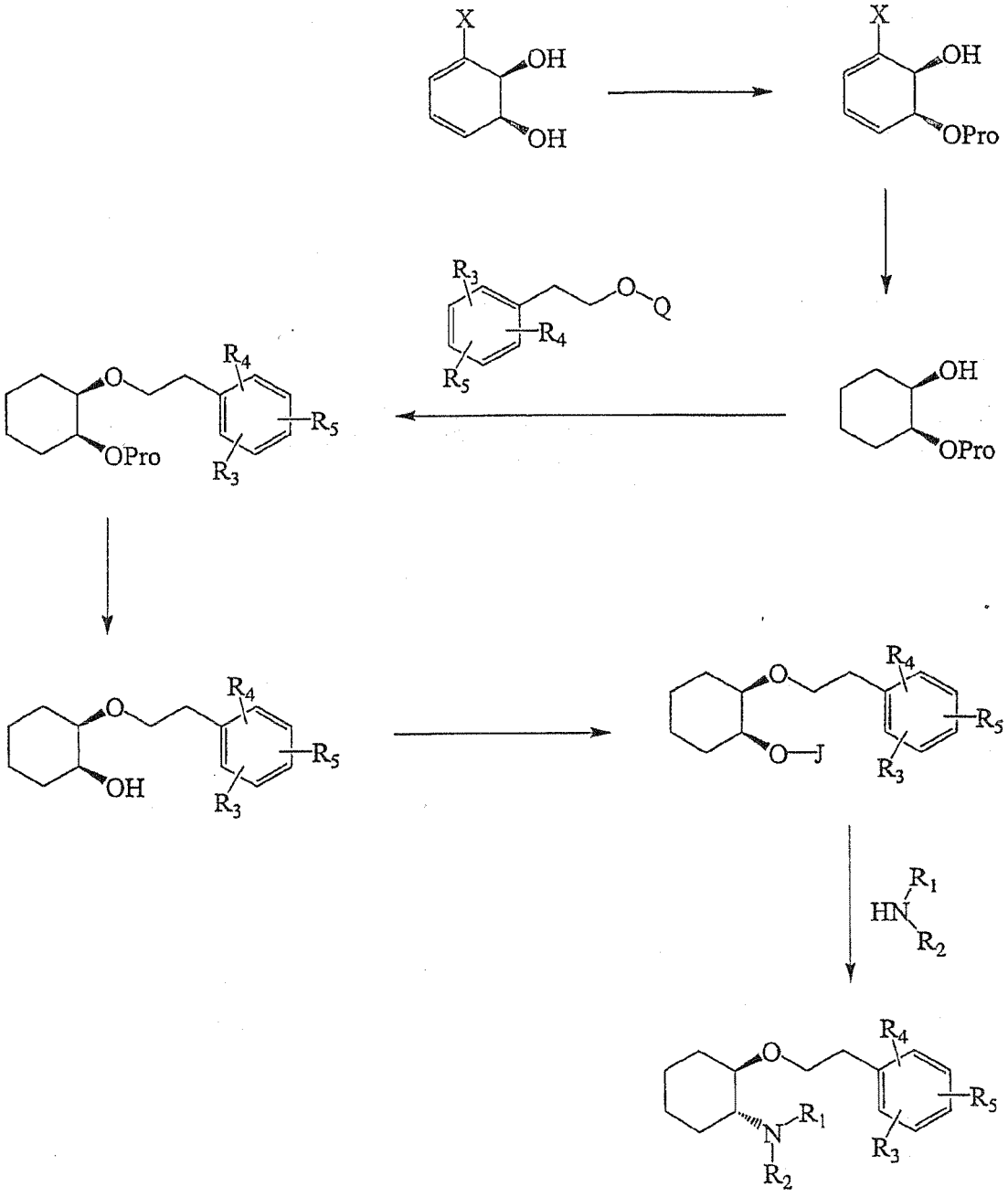

X
OH
OH
X
OH
OPro
R3
O
Q
R4
R5
OH
OPro
O
R4
R5
OPro
R3
O
R4
R5
OH
R3
O
R4
R5
O
J
R3
R1
HN
R2
O
R4
R5
R1
N
R2
R3

Figure 125

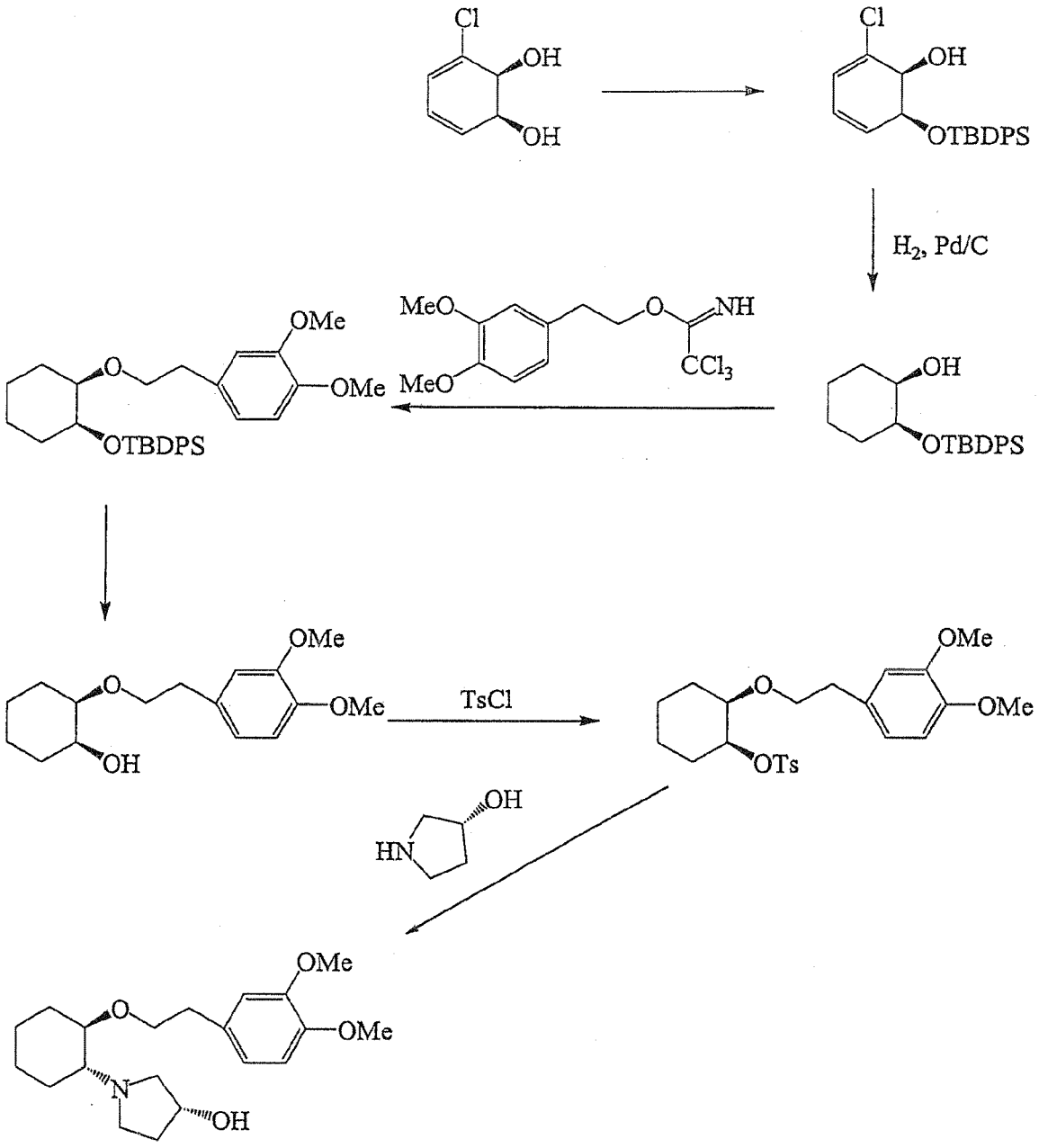

Cl
OH
OH
Cl
OH
OTBDPS
H2, Pd/C
MeO
NH
CCl3
MeO
OMe
OMe
O
OTBDPS
OH
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
OH
HN
OMe
OMe
O
N
OH

Figure 126

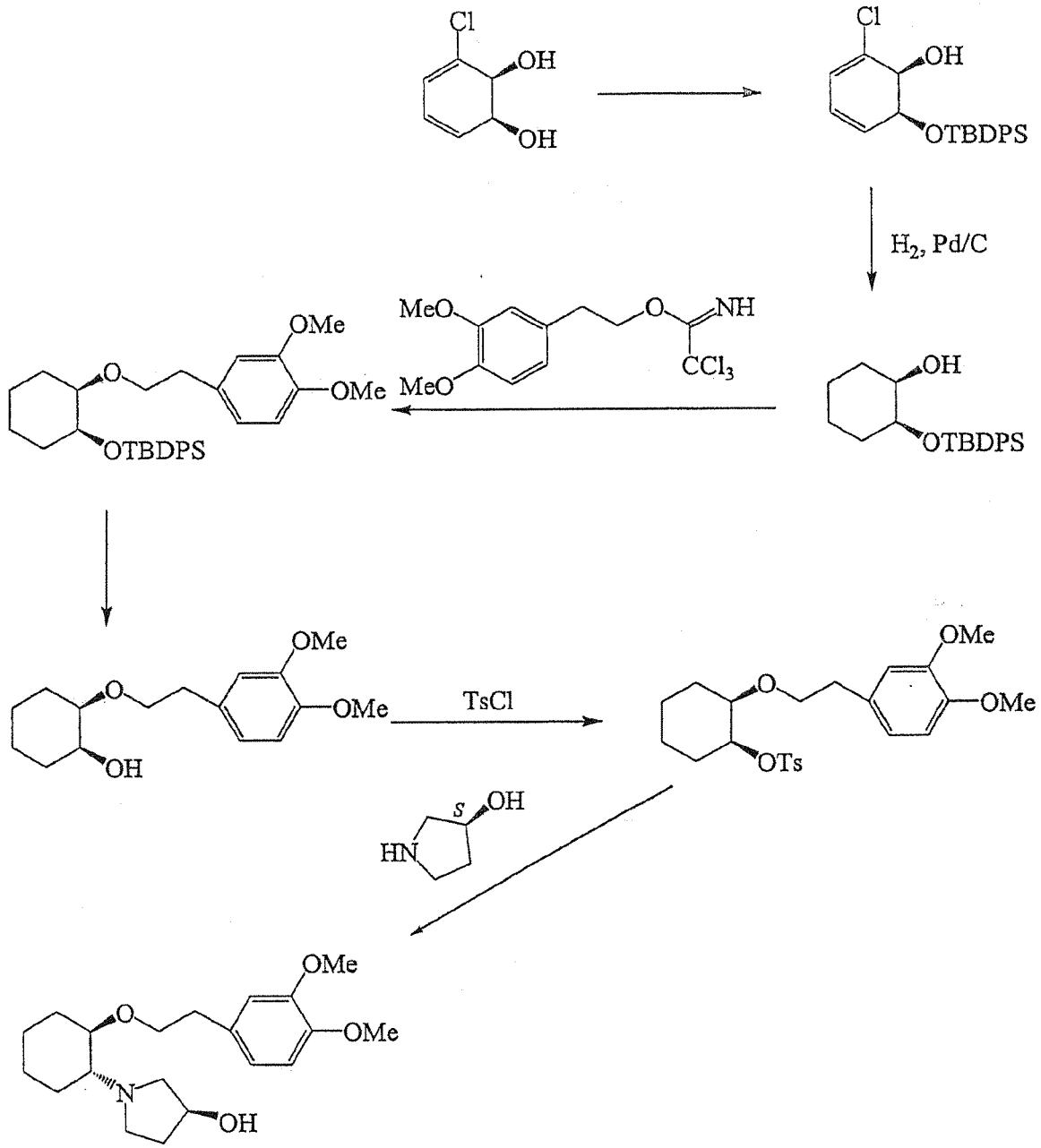

Cl
OH
OH
Cl
OH
OTBDPS
H_2, Pd/C
MeO
O
NH
CCl_3
MeO
OMe
OMe
O
OTBDPS
OH
OTBDPS
OMe
O
OMe
OH
TsCl
OMe
O
OMe
OTs
S
OH
HN
OMe
O
OMe
N
OH

Figure 127

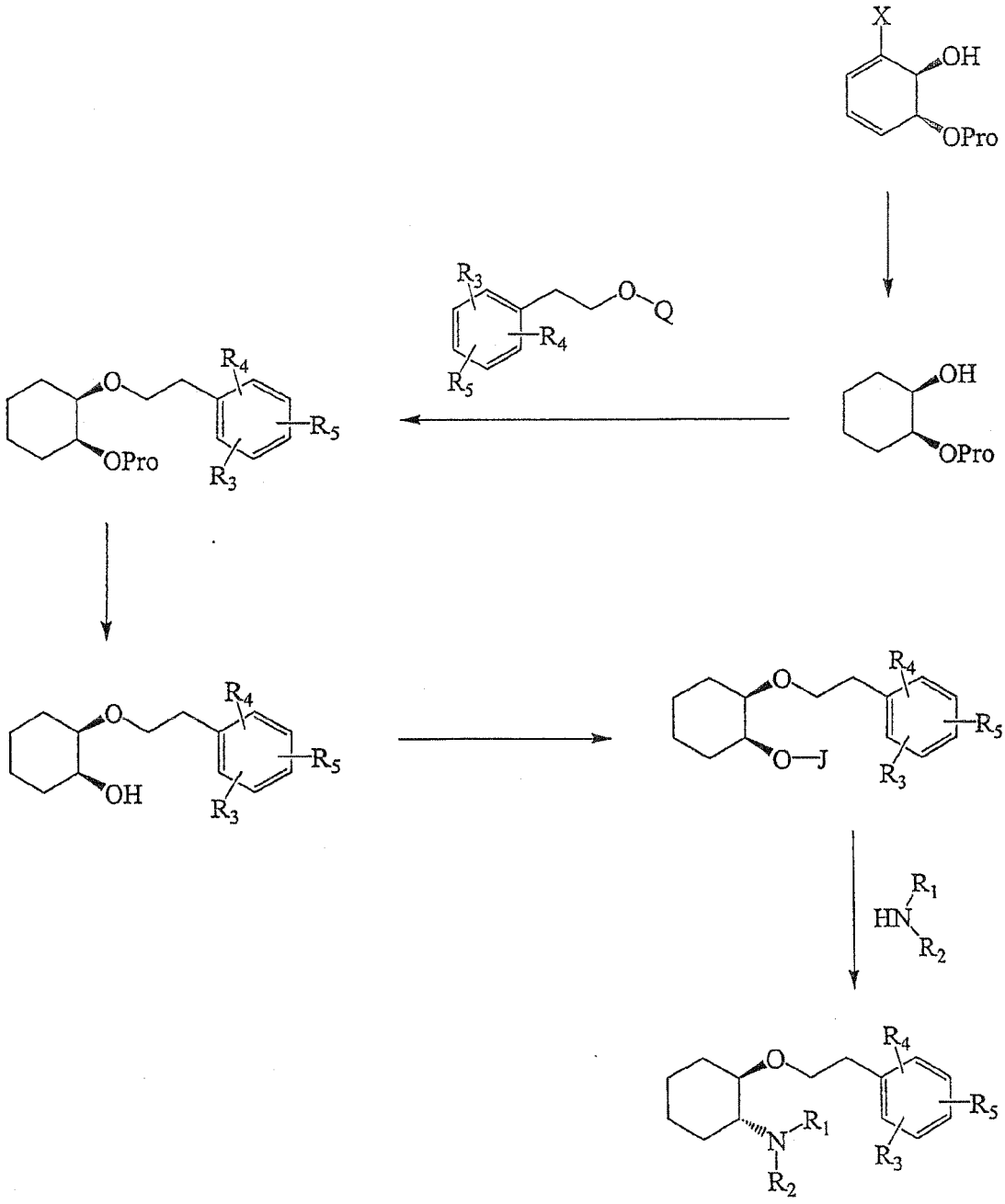

X
OH
OPro
R3
R4
O
Q
R5
OH
OPro
R4
O
R5
OPro
R3
R4
O
R5
OH
R3
R4
O
R5
O—J
R3
R1
HN
R2
R4
O
R5
R1
N
R3
R2

Figure 128

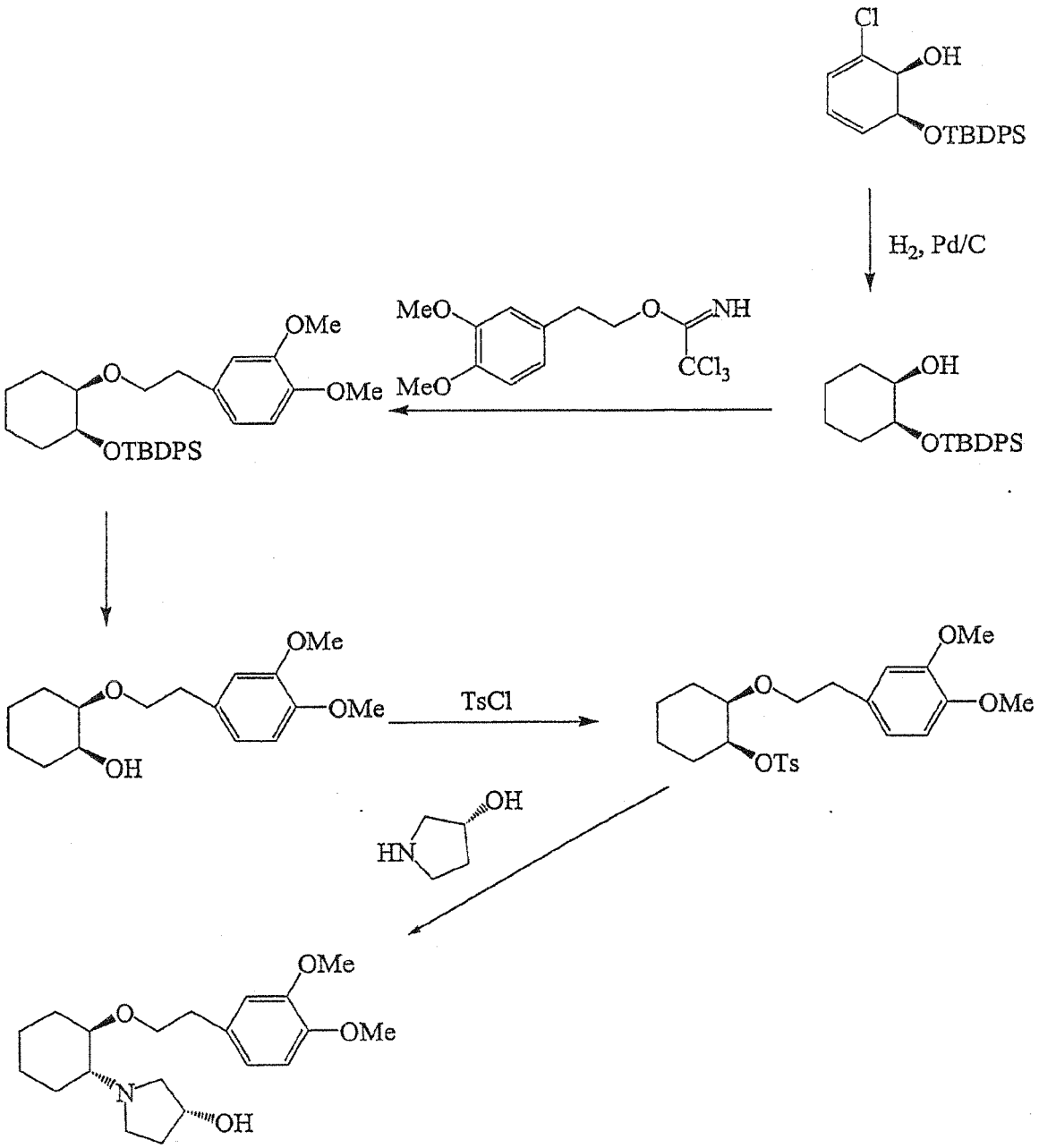

Cl
OH
OTBDPS
H2, Pd/C
MeO
NH
CCl3
MeO
OMe
OMe
O
OTBDPS
OH
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
OH
HN
OMe
OMe
O
N
OH

Figure 129

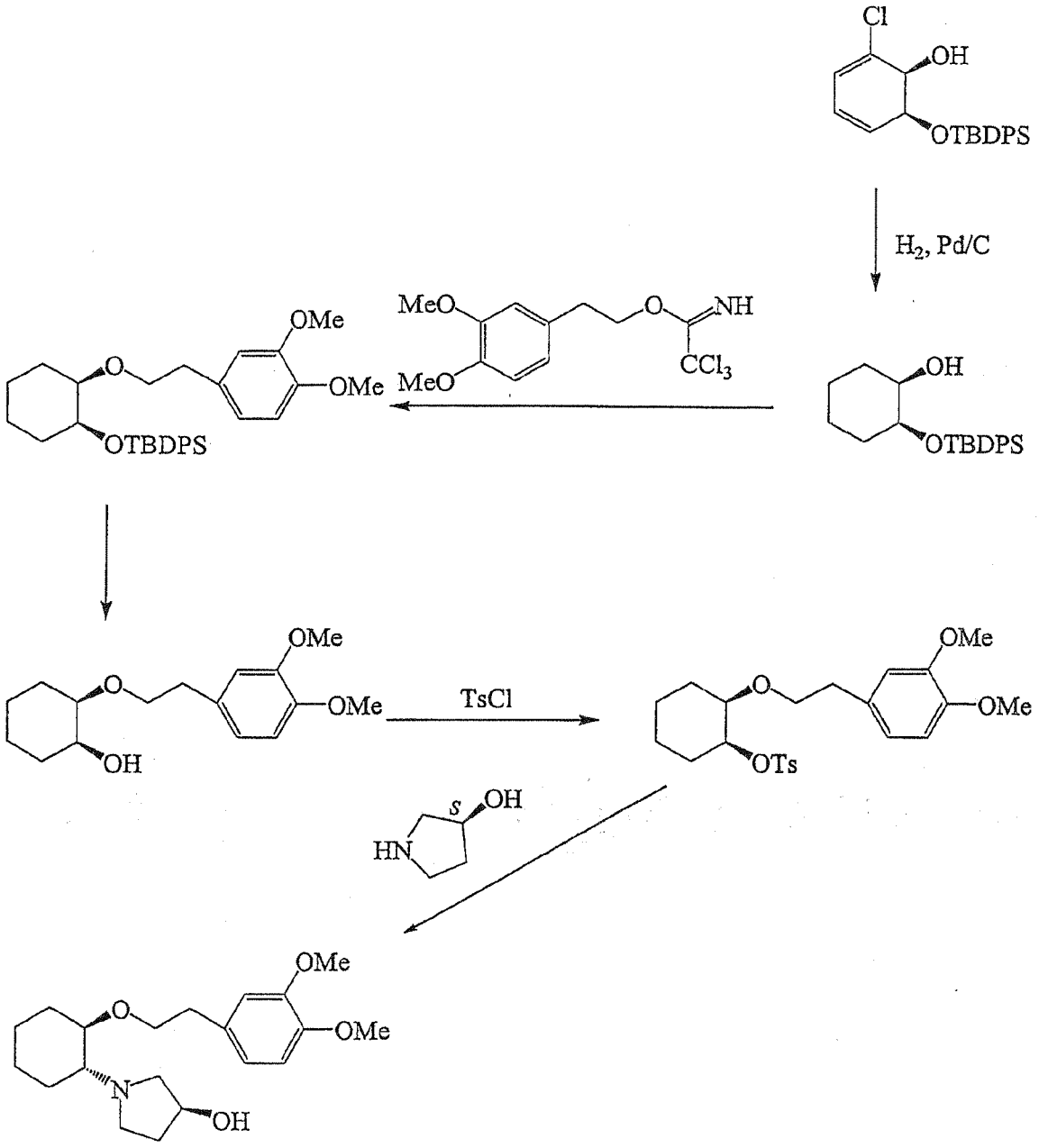

Cl
OH
OTBDPS
H2, Pd/C
MeO
NH
CCl3
MeO
OMe
OMe
O
OTBDPS
OH
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
S
OH
HN
OMe
OMe
O
N
OH

Figure 130

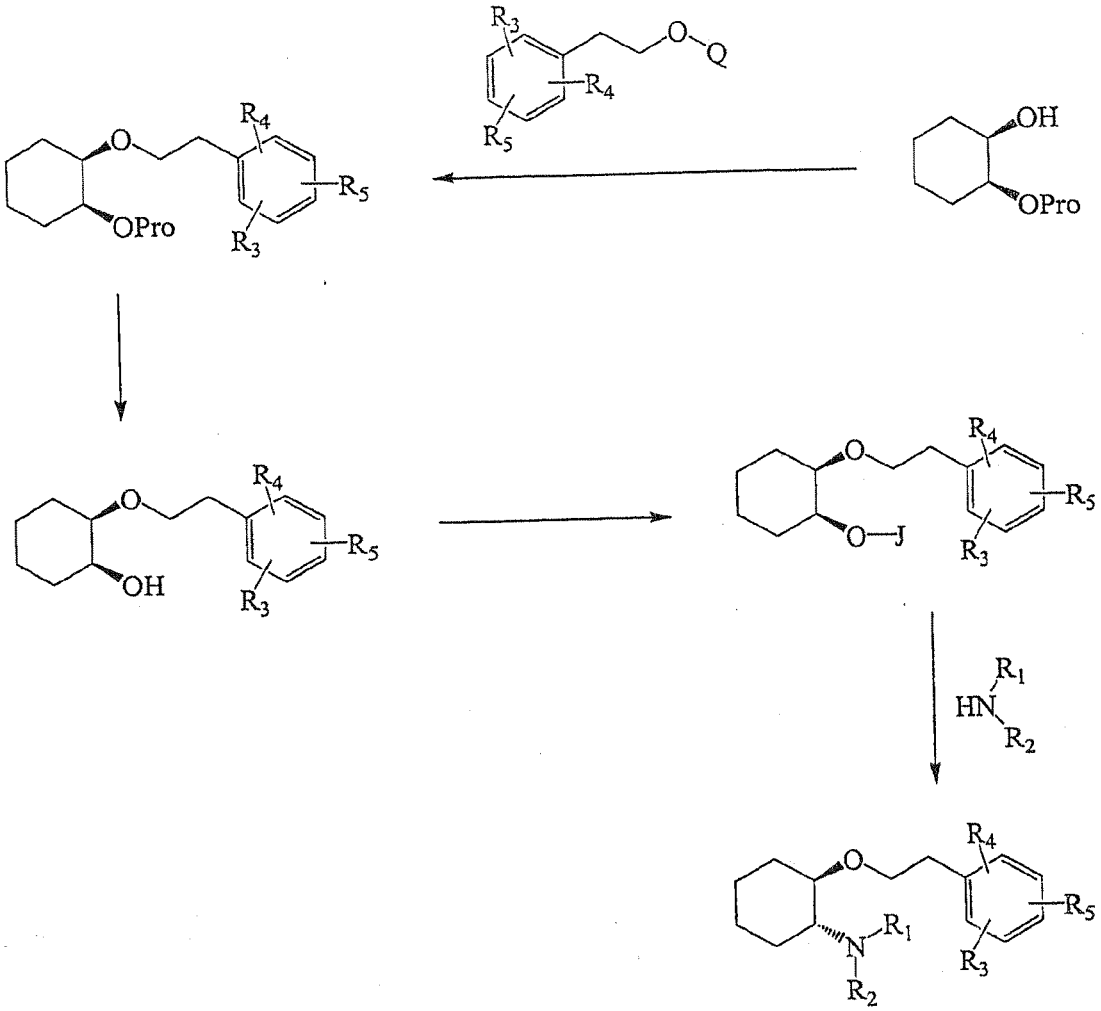

R3
O
Q
R4
R5
OH
OPro
R4
O
R5
OPro
R3
R4
O
R5
OH
R3
R4
O
R5
O
J
R3
R1
HN
R2
R4
O
R5
R1
N
R3
R2

Figure 131

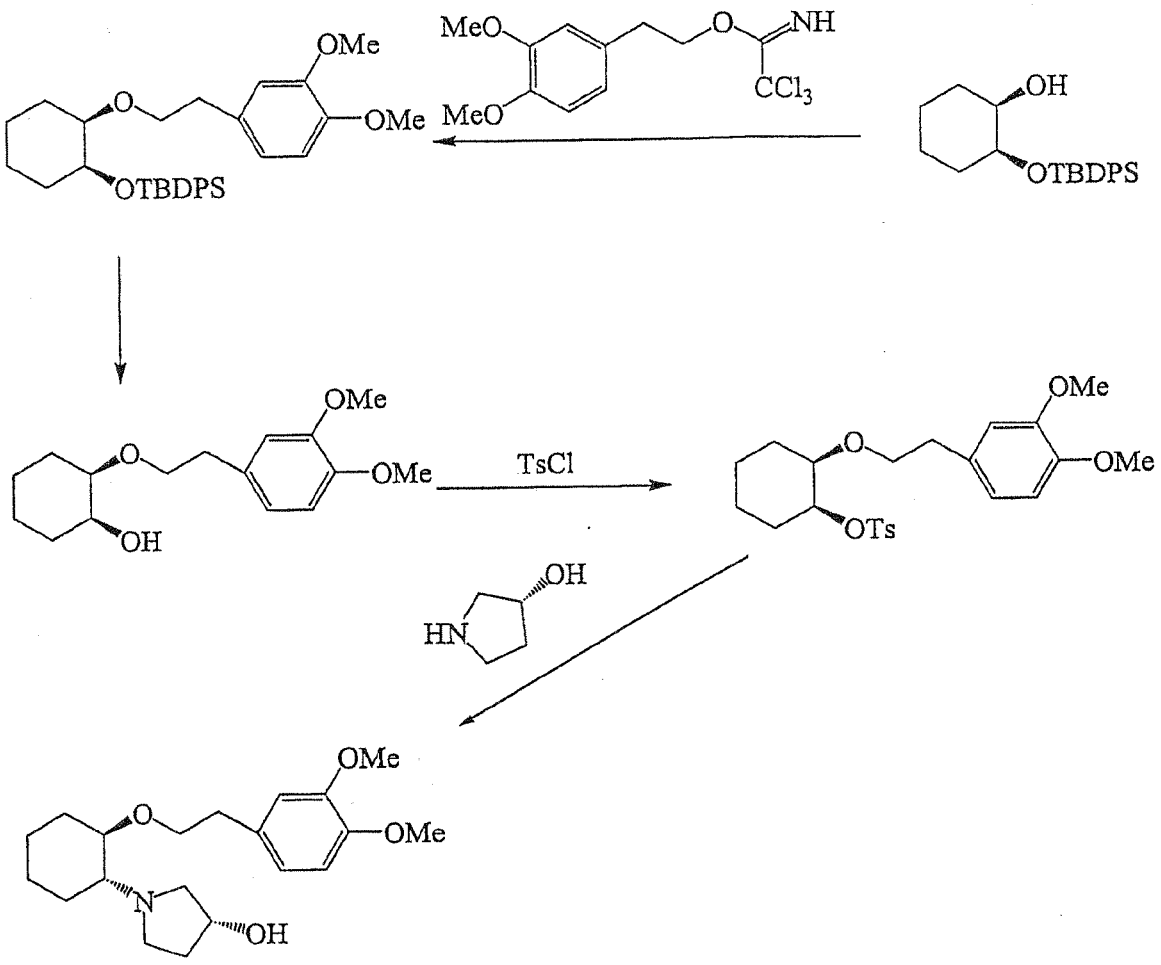

MeO
MeO
O
NH
CCl3
OH
OTBDPS
OMe
OMe
O
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
OH
HN
OMe
OMe
O
N
OH

Figure 132

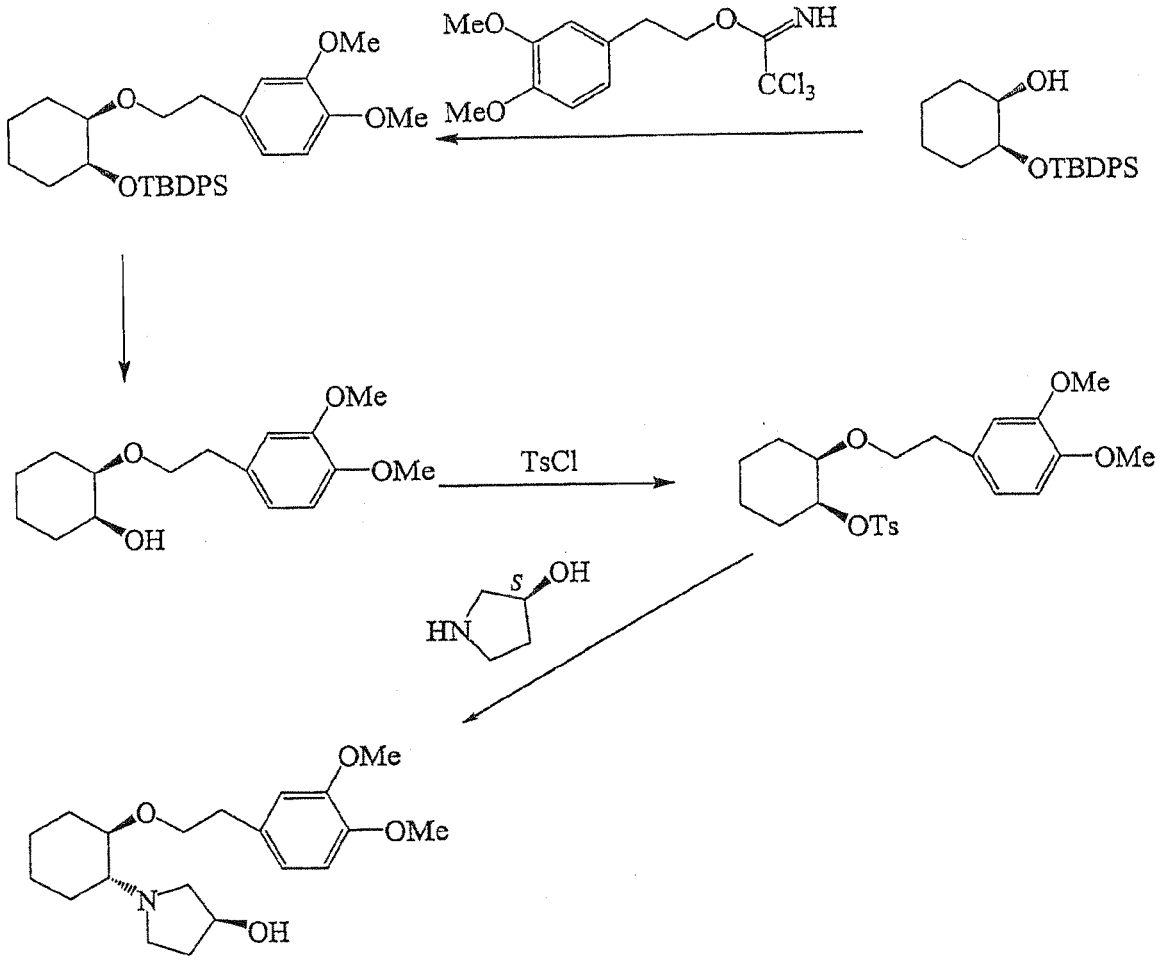

MeO
NH
CCl3
MeO
OMe
OMe
O
OTBDPS
OH
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
S
OH
HN
OMe
OMe
O
N
OH

Figure 133

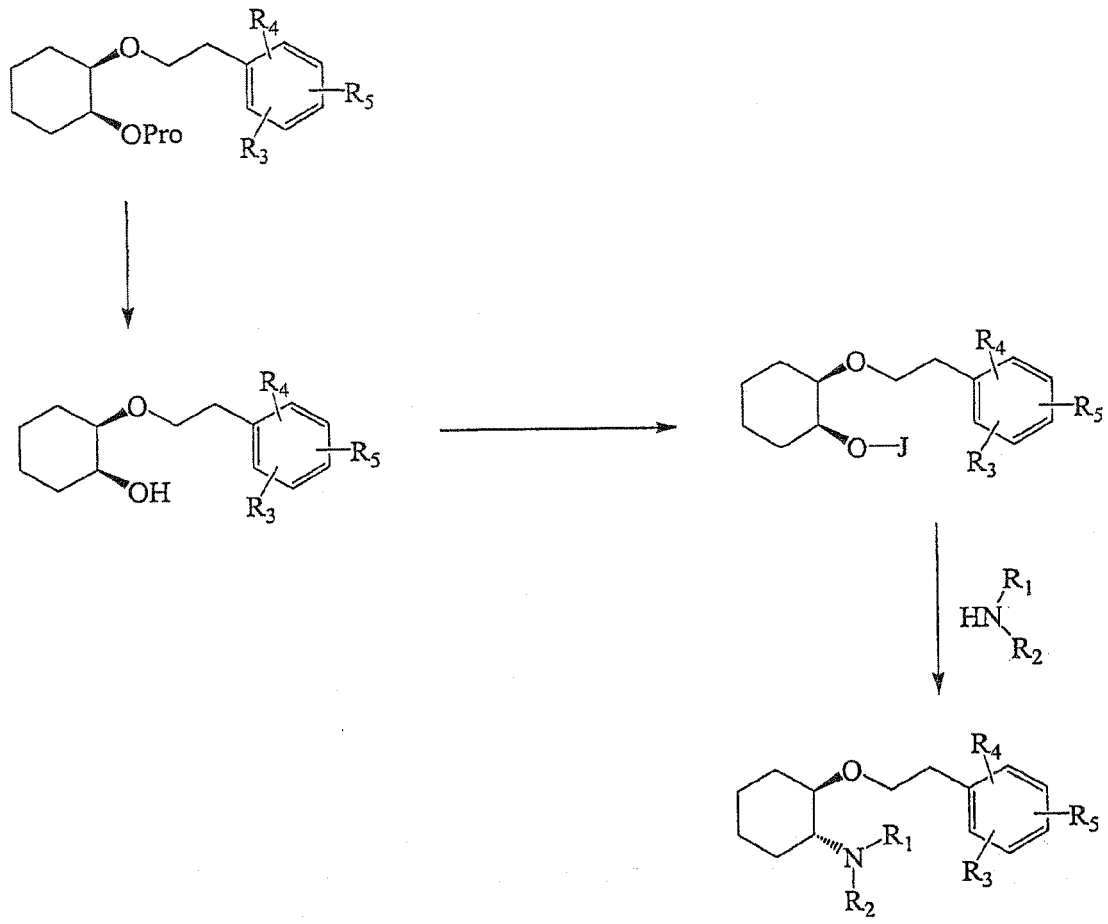


Figure 134

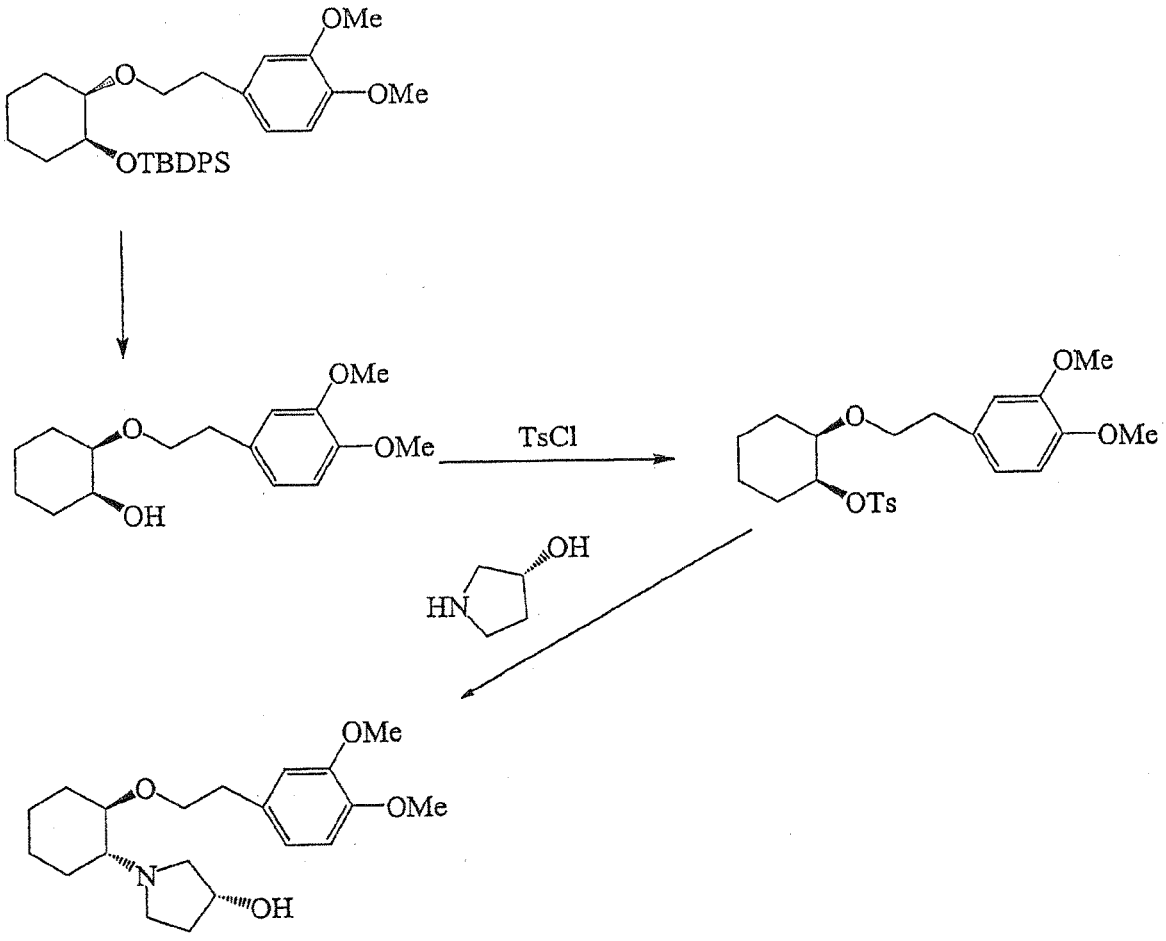

OMe
OMe
O
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
OH
HN
OMe
OMe
O
N
OH

Figure 135

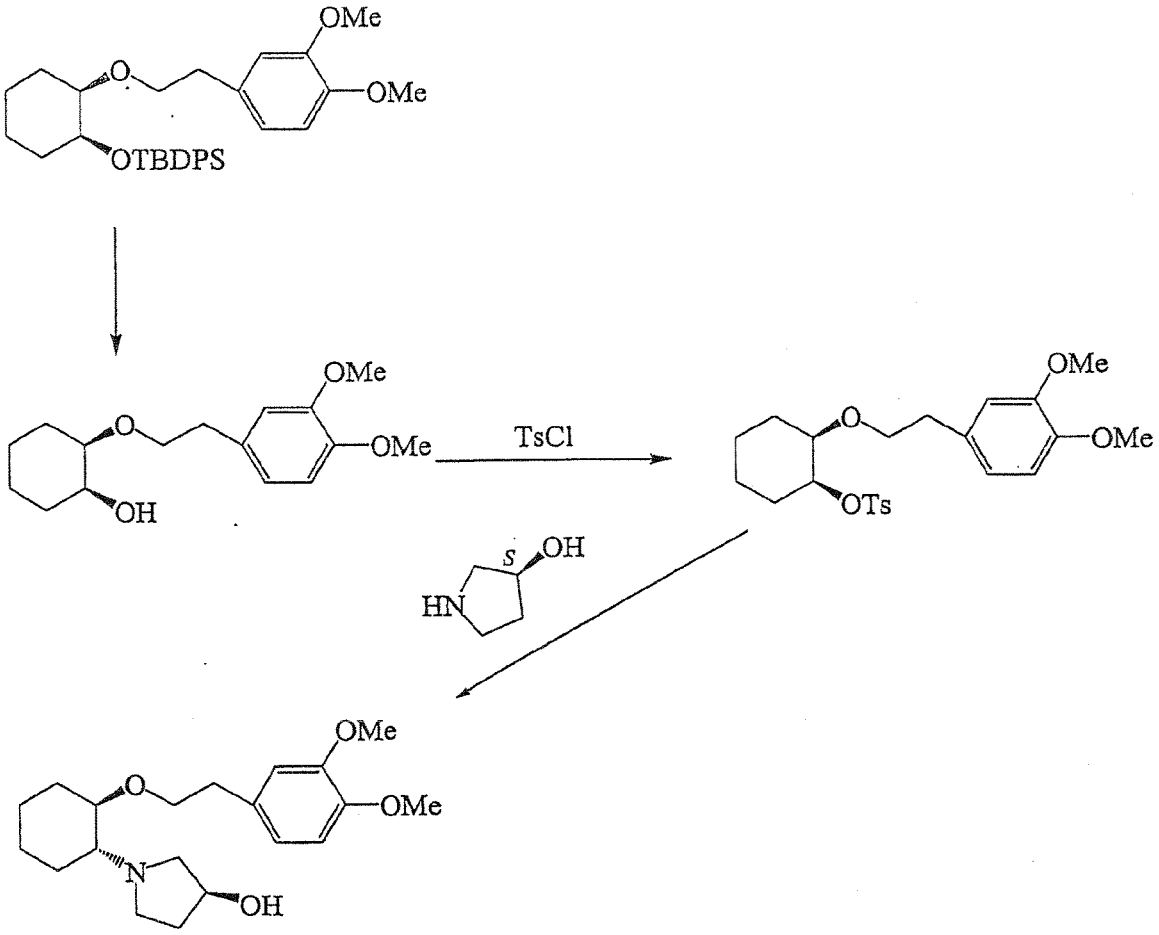

OMe
OMe
O
OTBDPS
OMe
OMe
O
OH
TsCl
OMe
OMe
O
OTs
S
OH
HN
OMe
OMe
O
N
OH

Figure 136

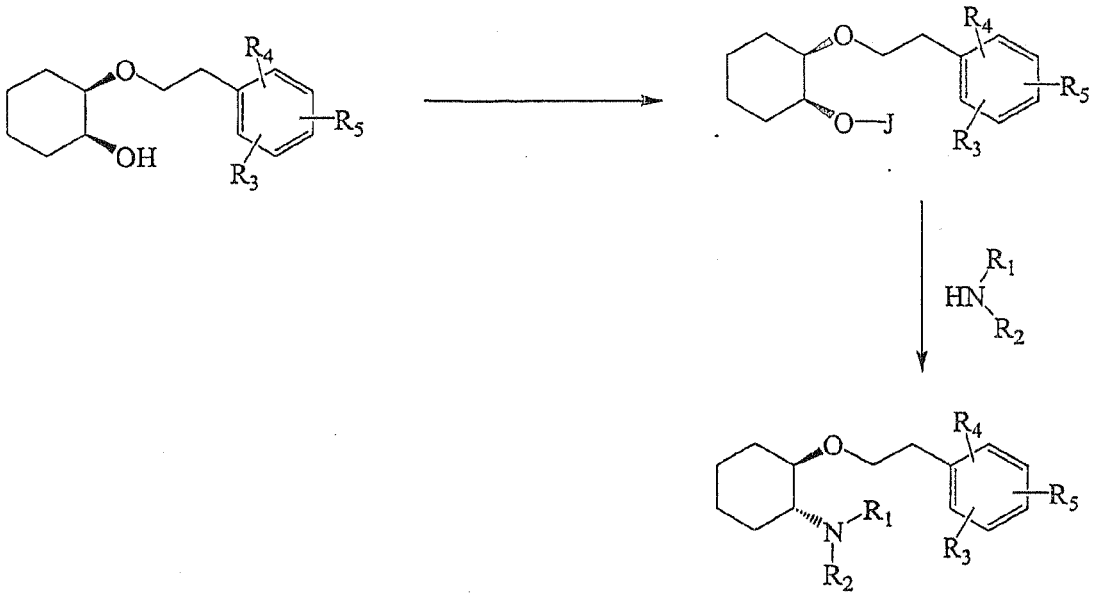


Figure 137

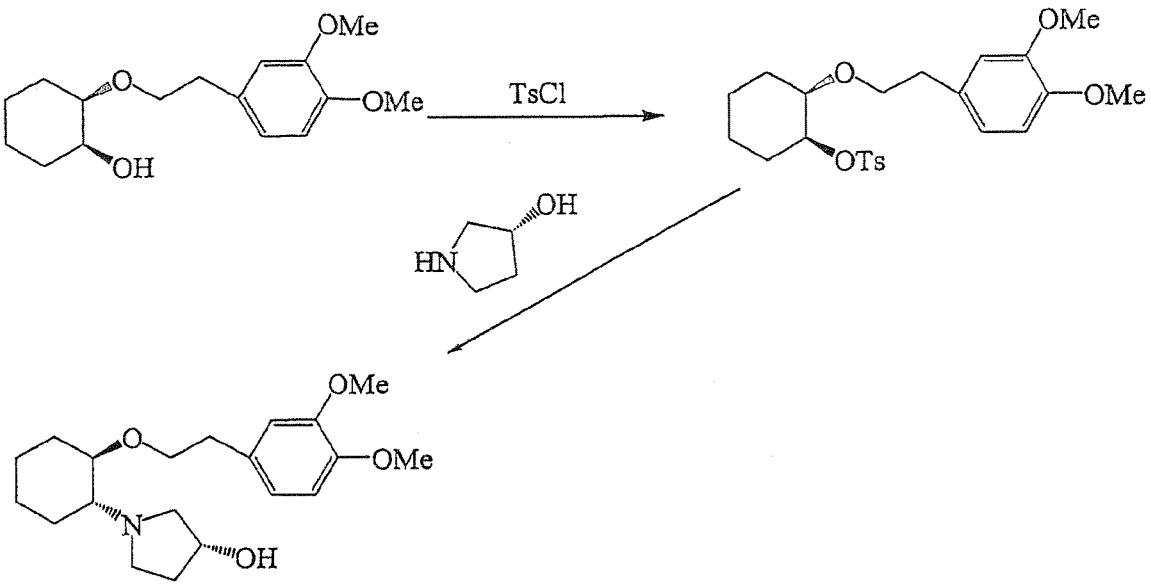


Figure 138

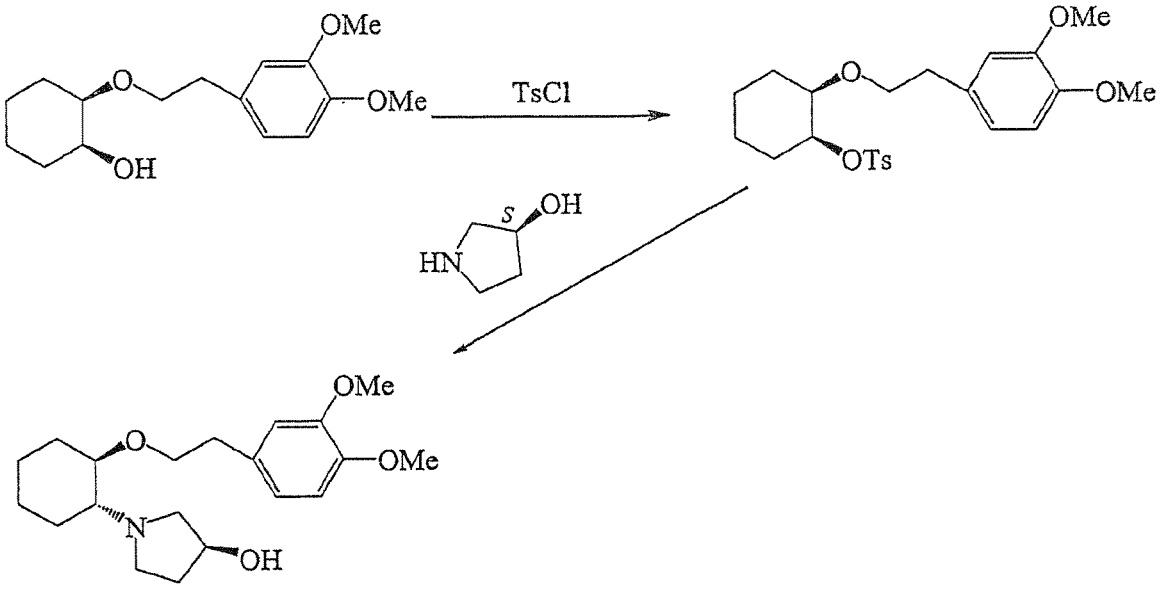


Figure 139

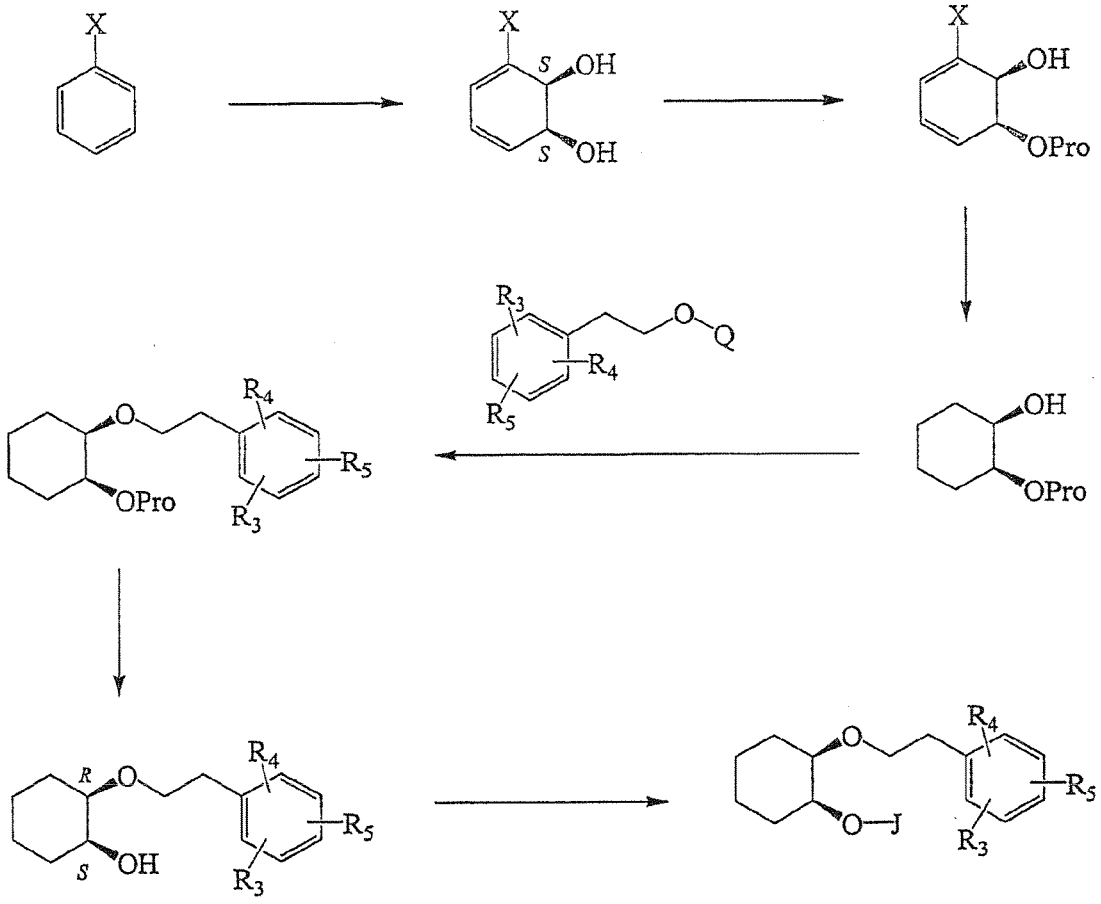

X
X
S
OH
S
OH
X
OH
OPro
R3
O
Q
R4
R5
OH
OPro
R4
O
R5
OPro
R3
R4
R
O
R5
S
OH
R3
R4
O
R5
O
J
R3

Figure 140

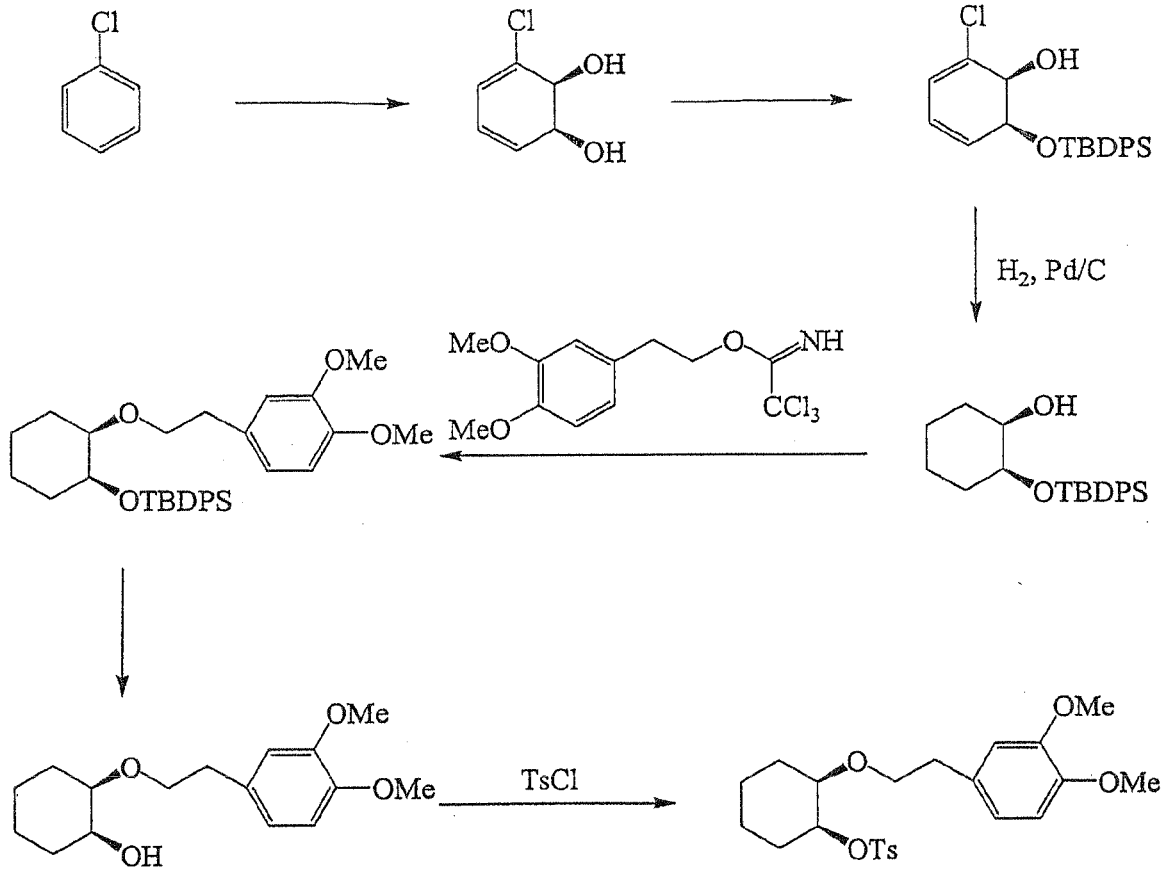

Cl
Cl
OH
OH
Cl
OH
OTBDPS
H2, Pd/C
OH
OTBDPS
MeO
O
NH
CCl3
MeO
OMe
O
OMe
OTBDPS
OMe
O
OMe
OH
TsCl
OMe
O
OMe
OTs

Figure 141

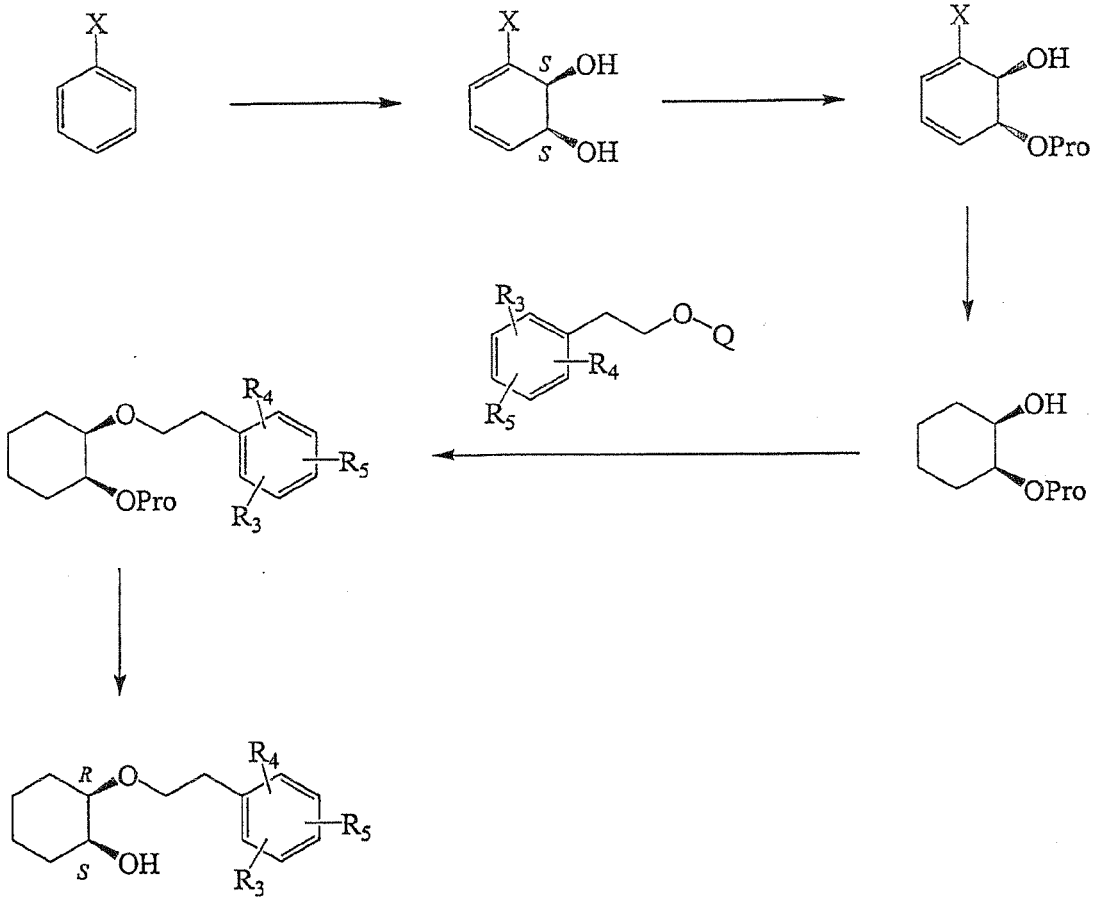

X
X
S
OH
S
OH
X
OH
OPro
R3
O
Q
R4
R5
OH
OPro
R4
O
R5
OPro
R3
R
O
R4
R5
S
OH
R3

Figure 142

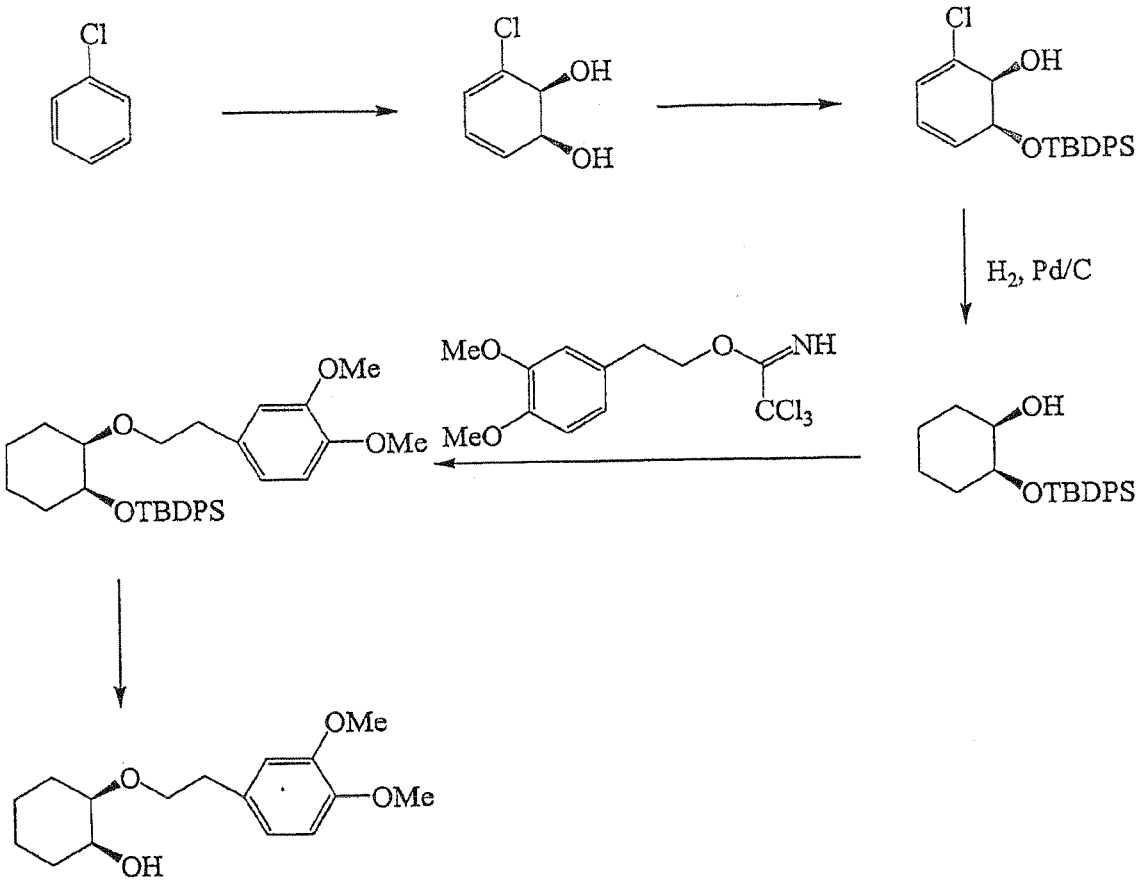

Cl
Cl
OH
OH
Cl
OH
OTBDPS
H2, Pd/C
OH
OTBDPS
MeO
O
NH
CCl3
MeO
OMe
O
OMe
OTBDPS
OMe
O
OMe
OH

Figure 143

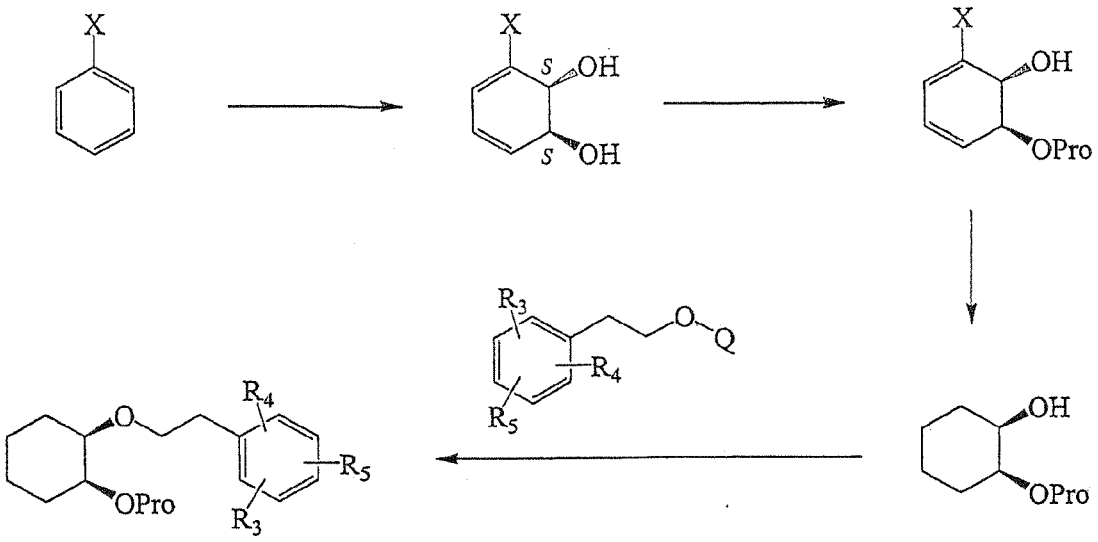


Figure 144

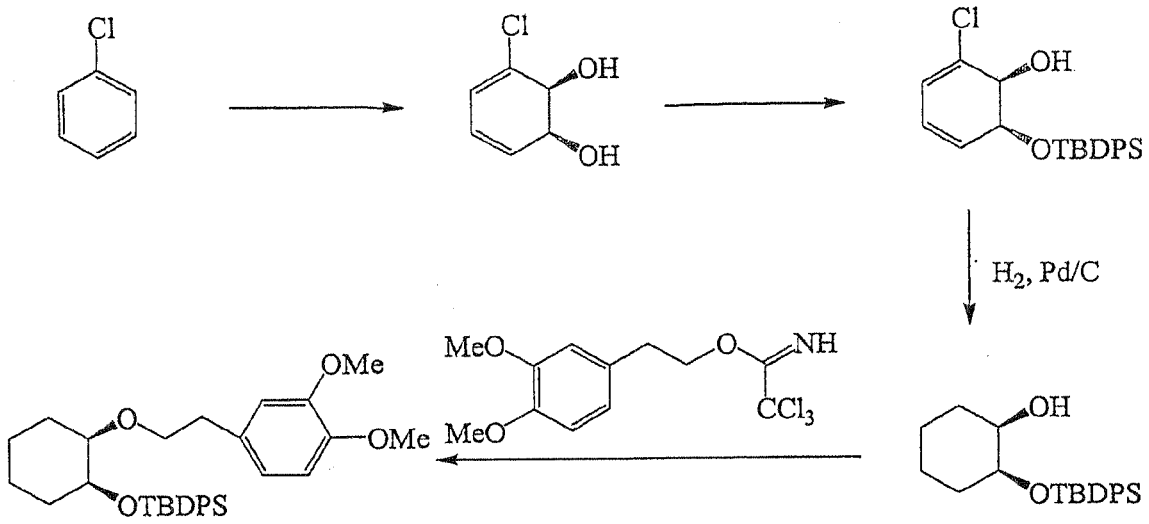

Cl
Cl
OH
OH
Cl
OH
OTBDPS
H_2, Pd/C
OH
OTBDPS
MeO
O
NH
CCl_3
MeO
OMe
OMe
O
OTBDPS

Figure 145

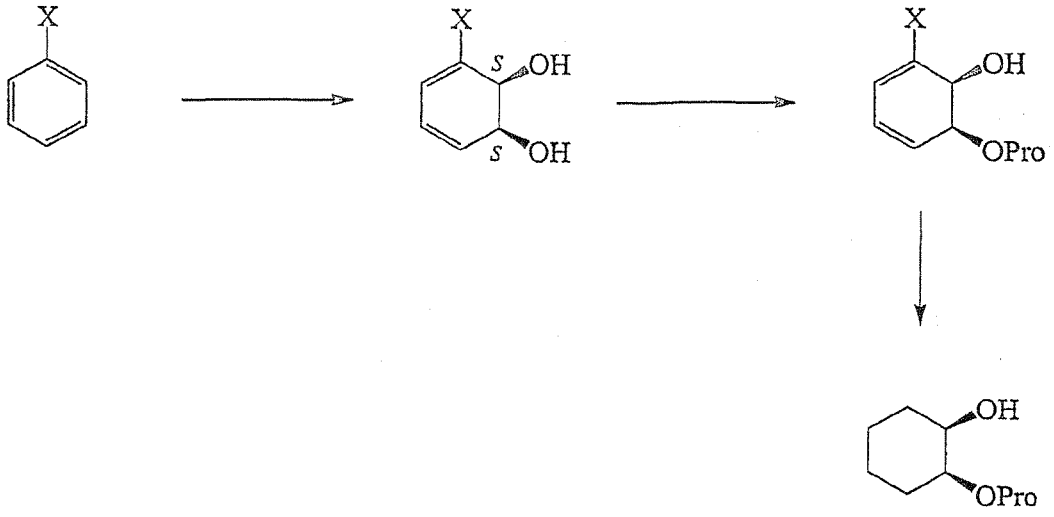


Figure 146

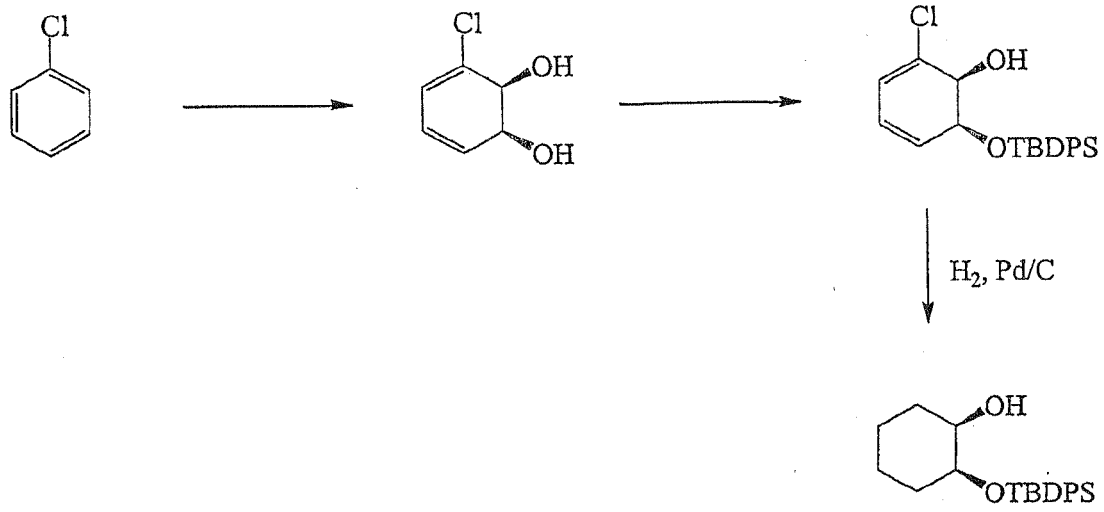


Figure 147

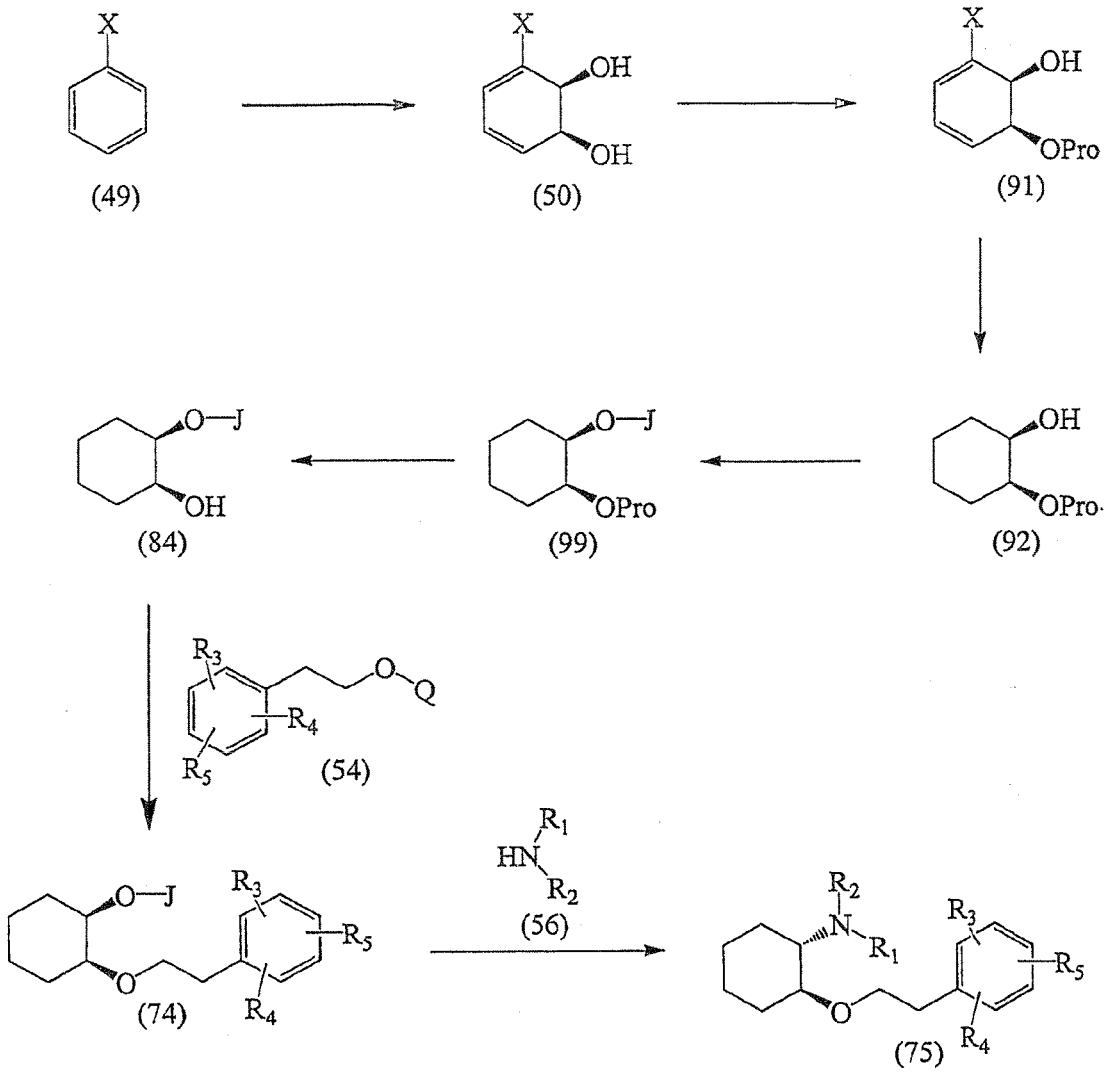


Figure 148

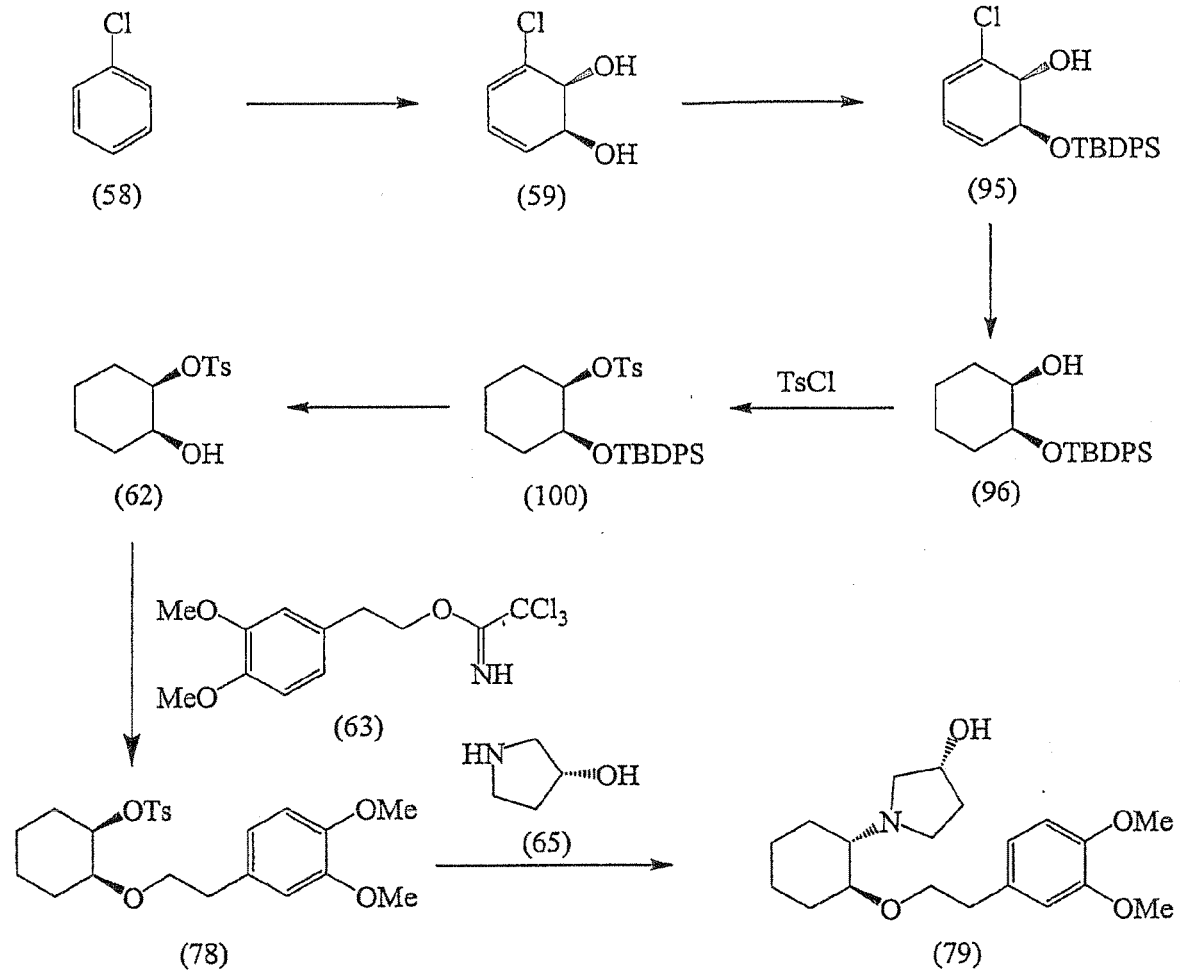

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OTBDPS
(95)
OH
OTBDPS
(96)
TsCl
OTs
OTBDPS
(100)
OTs
OH
(62)
MeO
MeO
O
CCl3
NH
(63)
HN
OH
(65)
OTs
OMe
OMe
O
(78)
OH
N
OMe
OMe
O
(79)

Figure 149

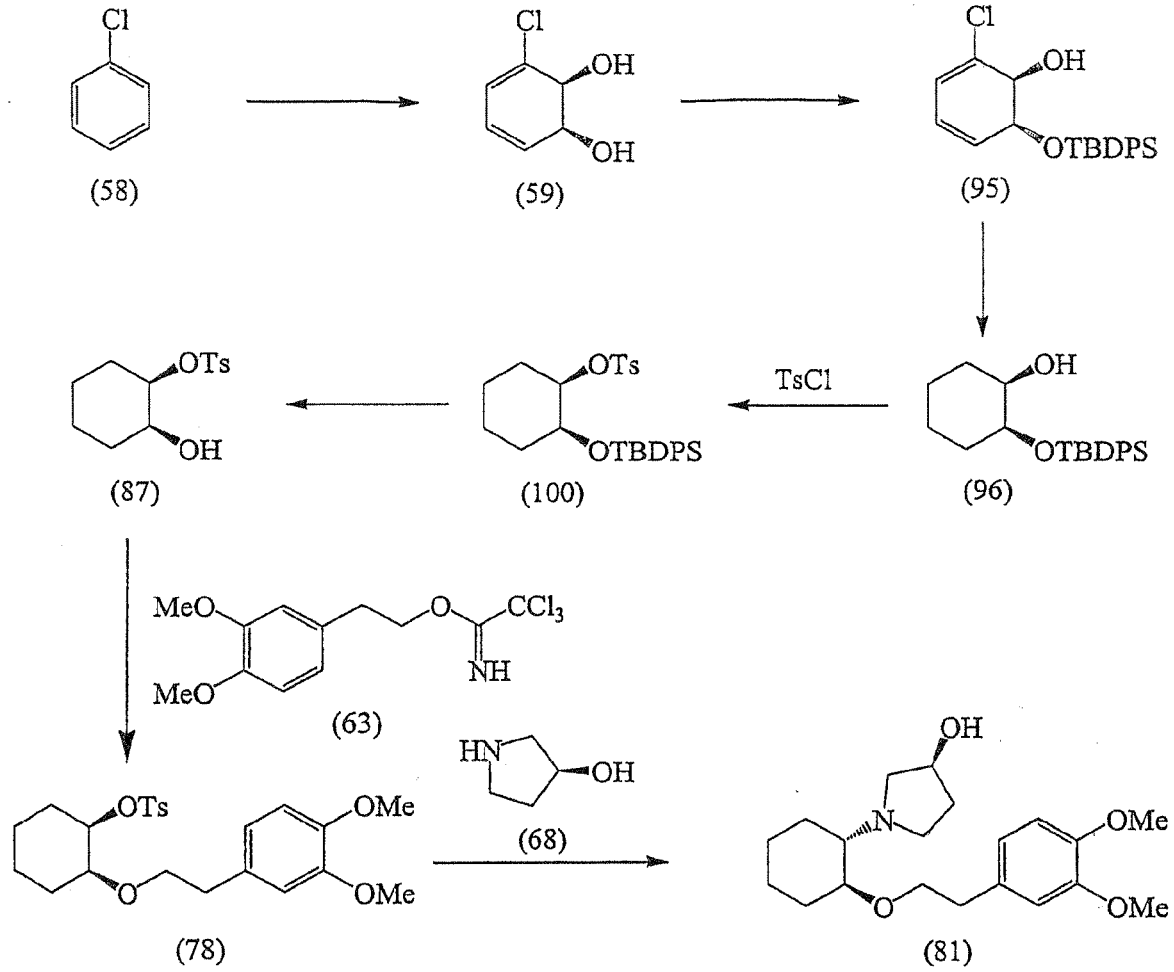

Cl
(58)
Cl
OH
OH
(59)
Cl
OH
OTBDPS
(95)
OH
OTBDPS
(96)
TsCl
OTs
OTBDPS
(100)
OTs
OH
(87)
MeO
MeO
O
CCl3
NH
(63)
HN
OH
(68)
OTs
OMe
OMe
O
(78)
OH
N
OMe
OMe
O
(81)

Figure 150

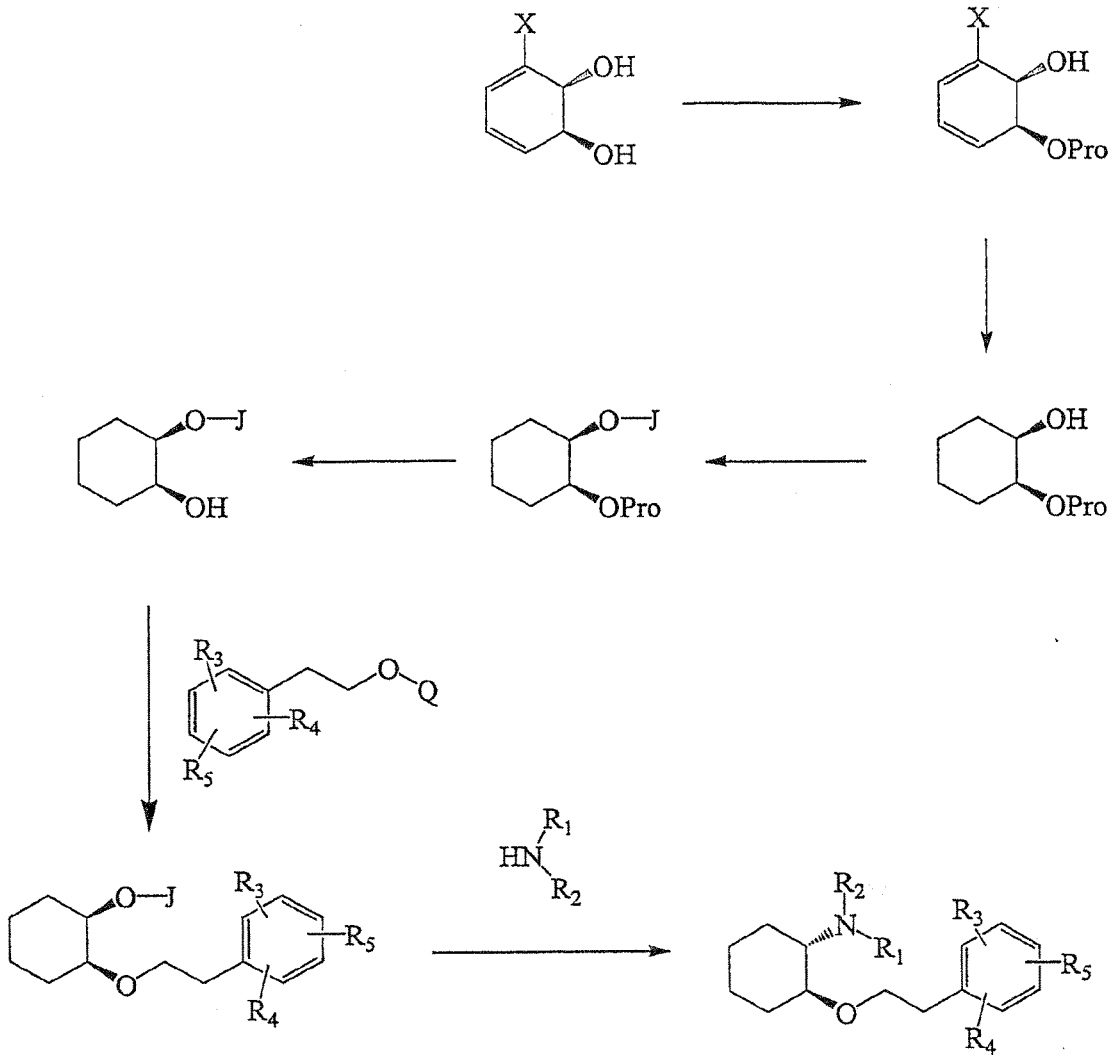

X
OH
OH
X
OH
OPro
OH
OPro
O—J
OPro
O—J
OH
R3
O
Q
R4
R5
R1
HN
R2
O—J
R3
R5
O
R4
R2
N
R1
R3
R5
O
R4

Figure 151

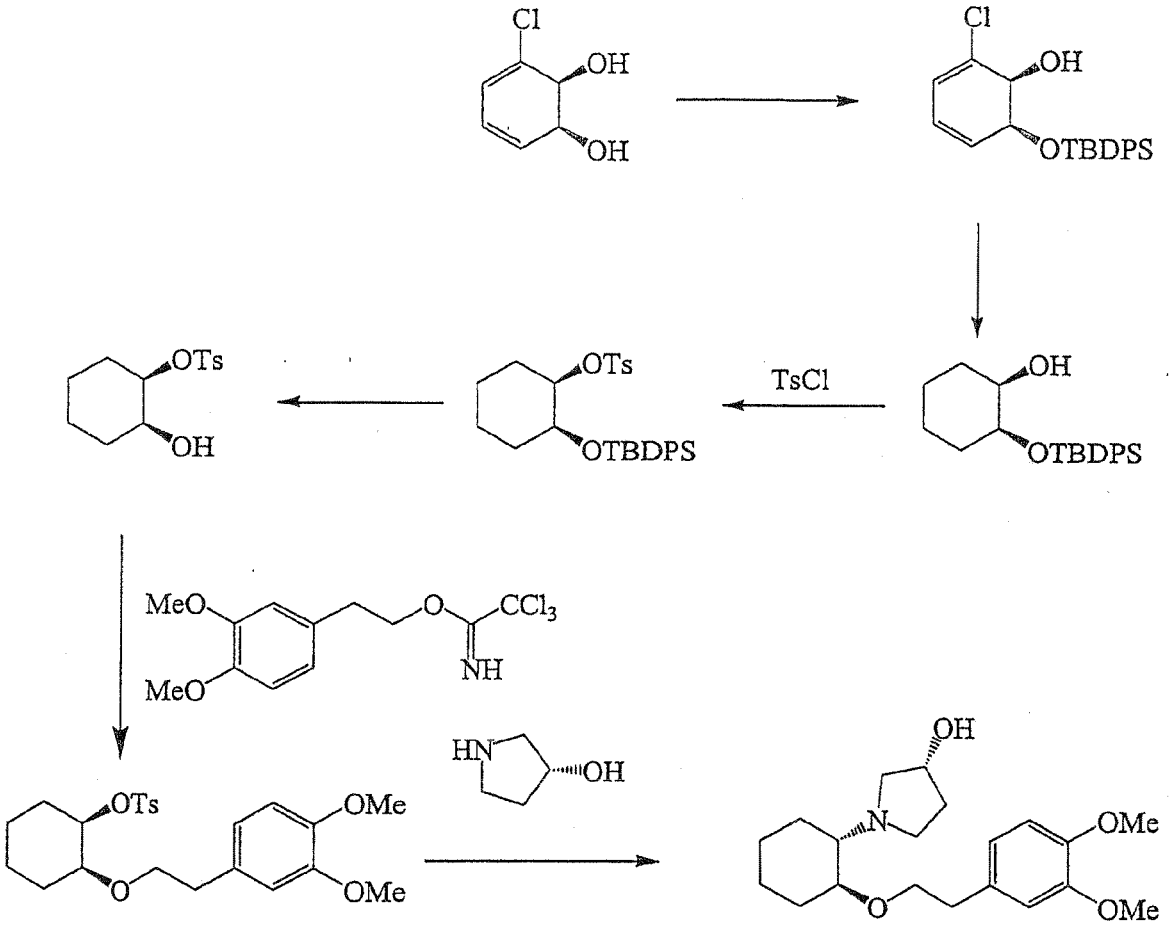

Cl
OH
OH
Cl
OH
OTBDPS
OH
OTBDPS
TsCl
OTs
OTBDPS
OTs
OH
MeO
MeO
O
CCl3
NH
HN
OH
OTs
O
OMe
OMe
OH
N
O
OMe
OMe

Figure 152

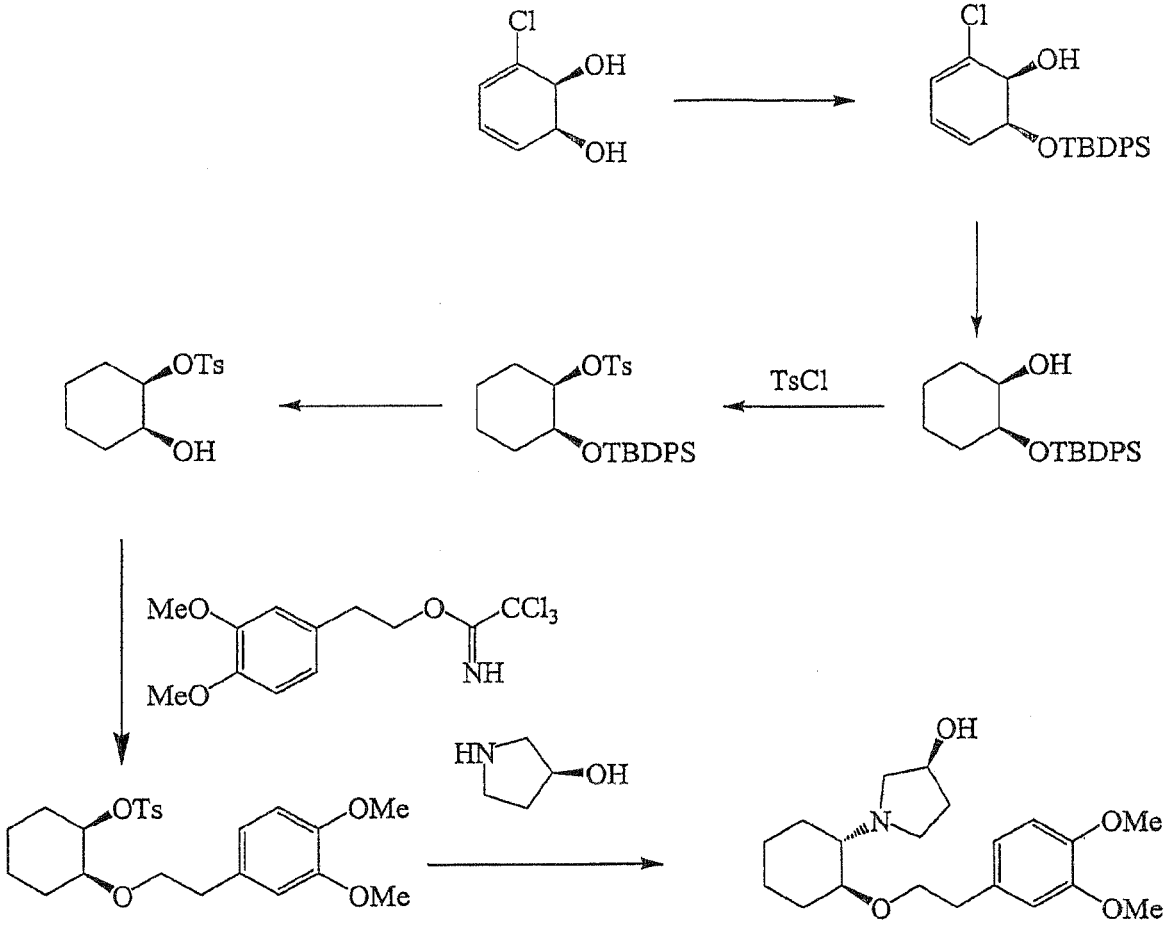

Cl
OH
OH
Cl
OH
OTBDPS
OH
OTBDPS
TsCl
OTs
OTBDPS
OTs
OH
MeO
MeO
O
CCl3
NH
HN
OH
OTs
O
OMe
OMe
OH
N
O
OMe
OMe

Figure 153

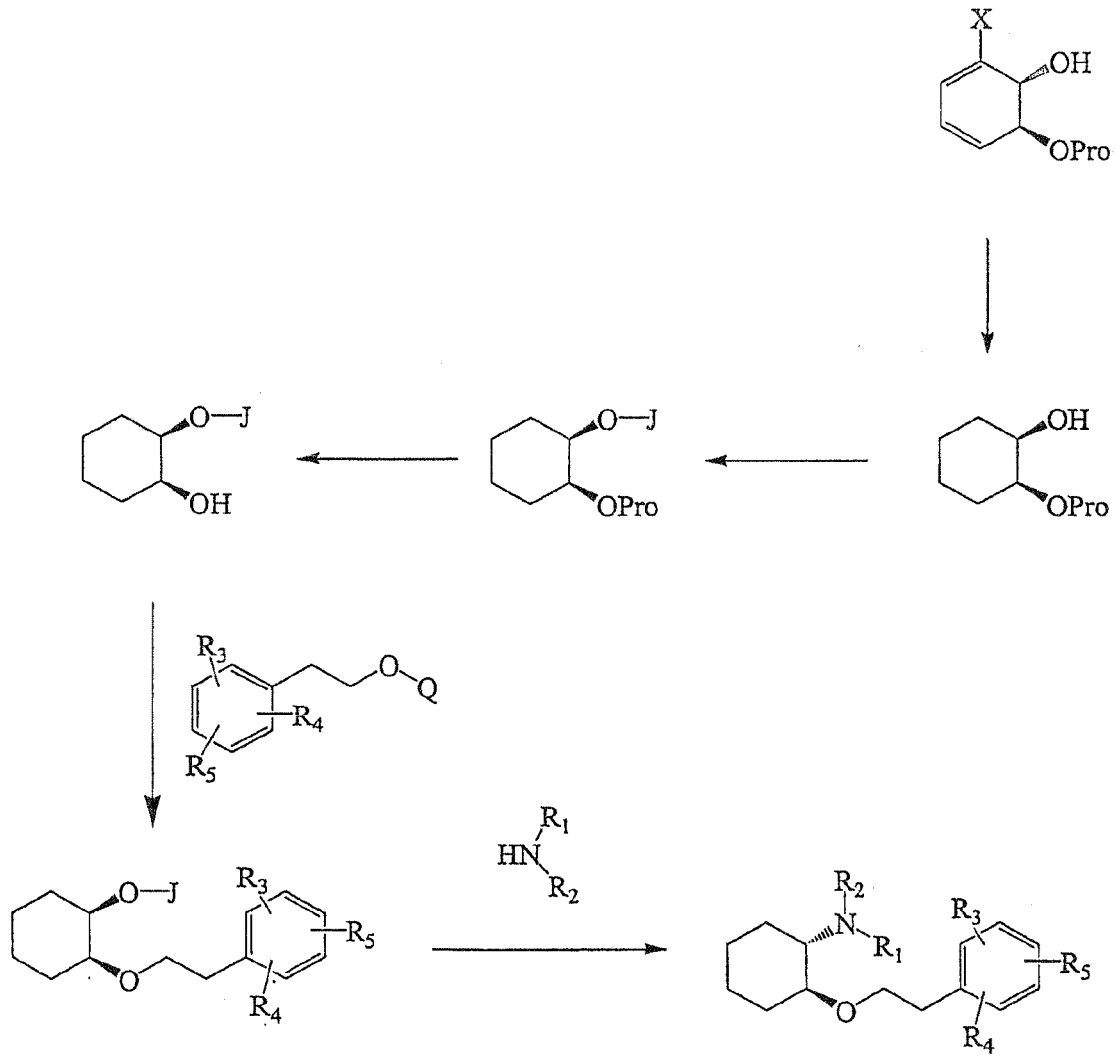

X
OH
OPro
OH
OPro
O—J
OPro
O—J
OH
R3
O
Q
R4
R5
R1
HN
R2
O—J
R3
R5
O
R4
R2
N
R1
R3
R5
O
R4

Figure 154

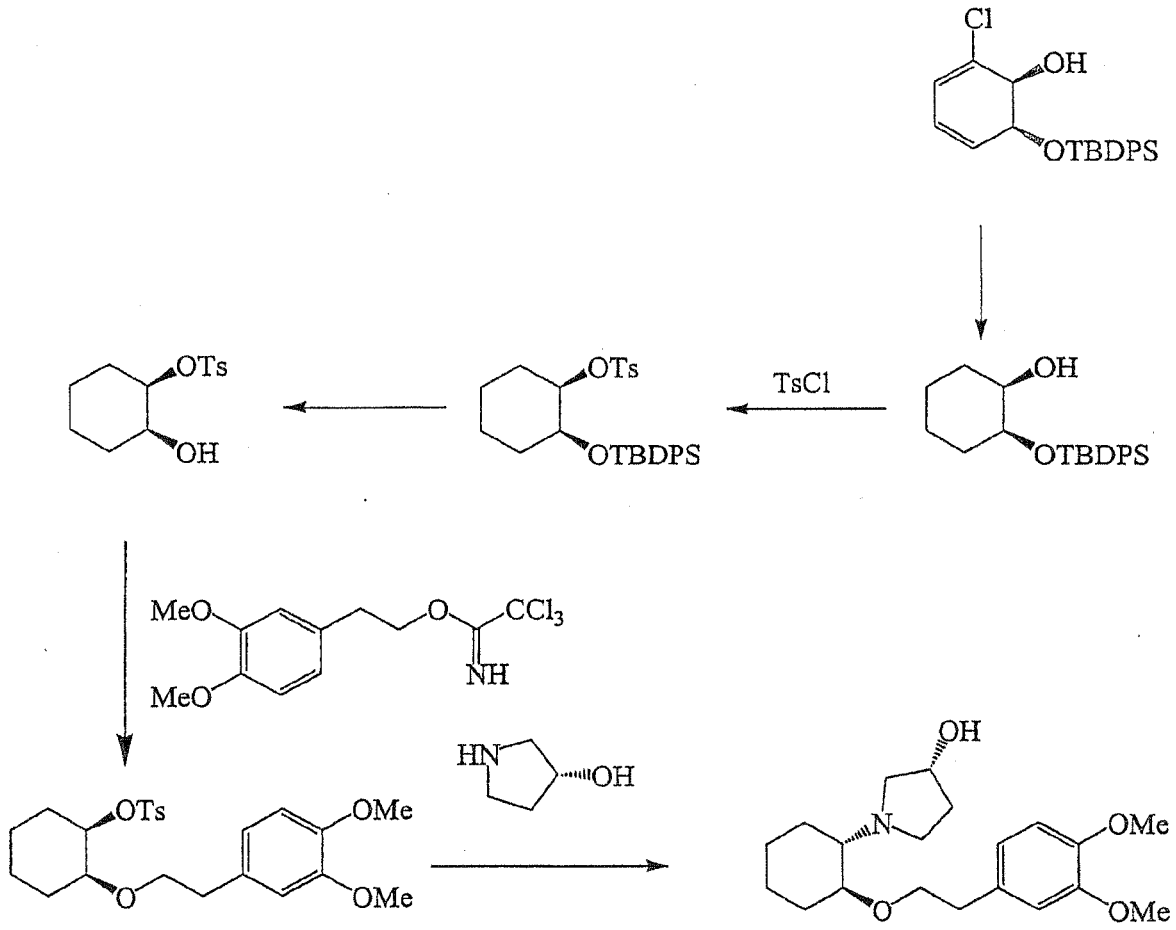

Cl
OH
OTBDPS
OH
OTBDPS
TsCl
OTs
OTBDPS
OTs
OH
MeO
MeO
O
CCl3
NH
HN
OH
OTs
O
OMe
OMe
OH
N
O
OMe
OMe

Figure 155

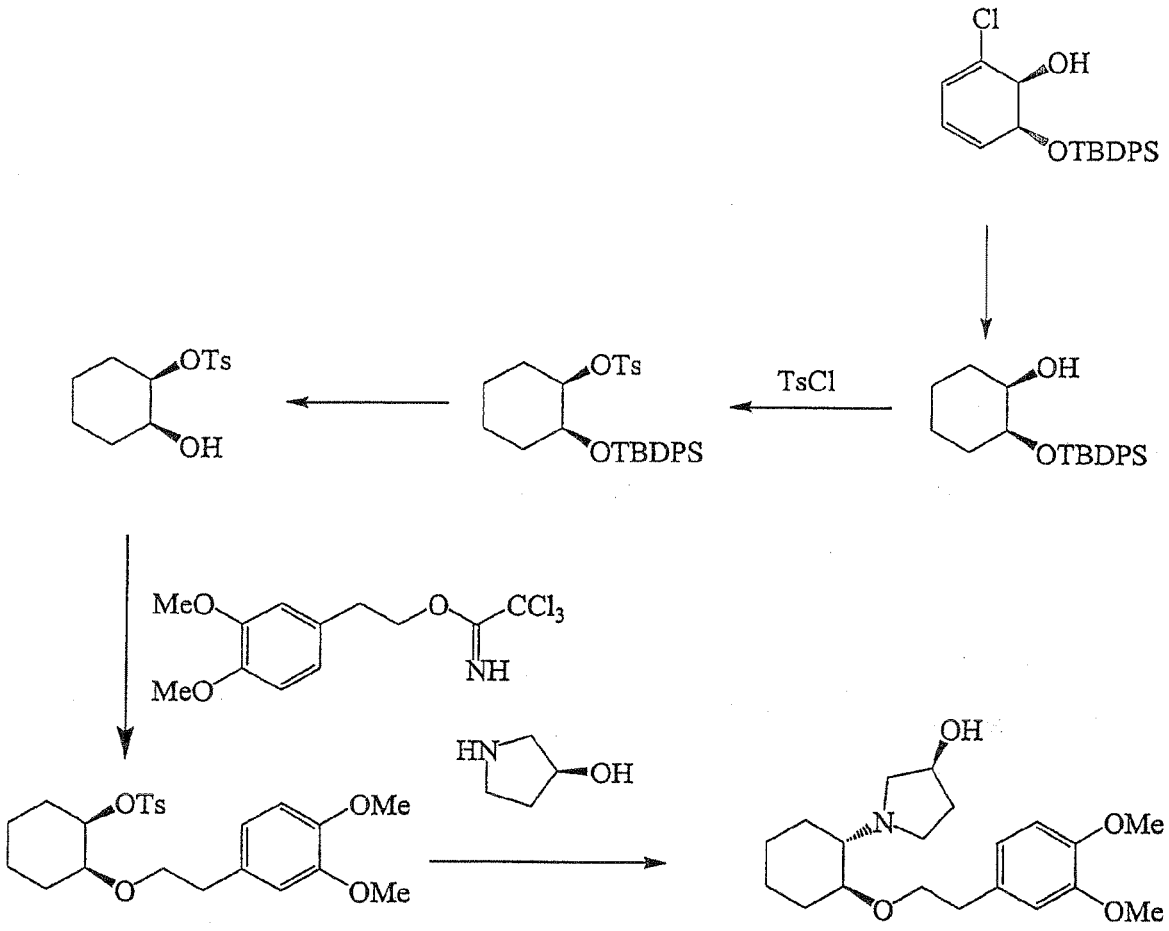

Cl
OH
OTBDPS
OH
OTBDPS
TsCl
OTs
OTBDPS
OTs
OH
MeO
MeO
O
CCl3
NH
HN
OH
OTs
OMe
OMe
O
OH
N
OMe
OMe
O

Figure 156

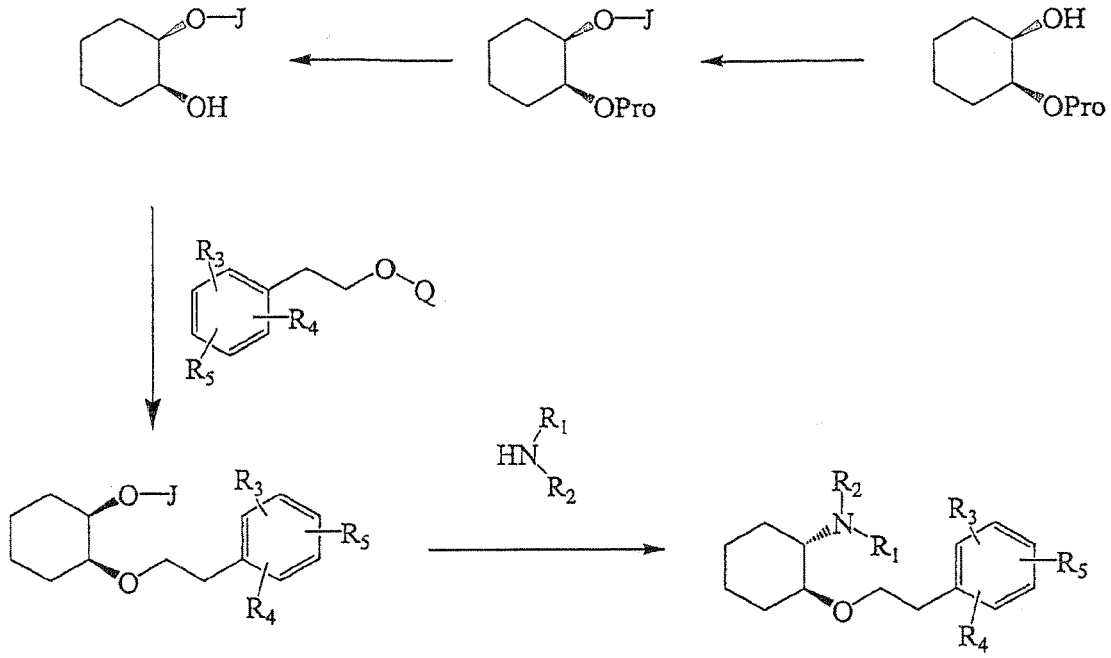

O—J
OH
O—J
OPro
OH
OPro
R3
O
Q
R4
R5
R1
HN
R2
O—J
R3
R5
O
R4
R2
N
R1
R3
R5
O
R4

Figure 157

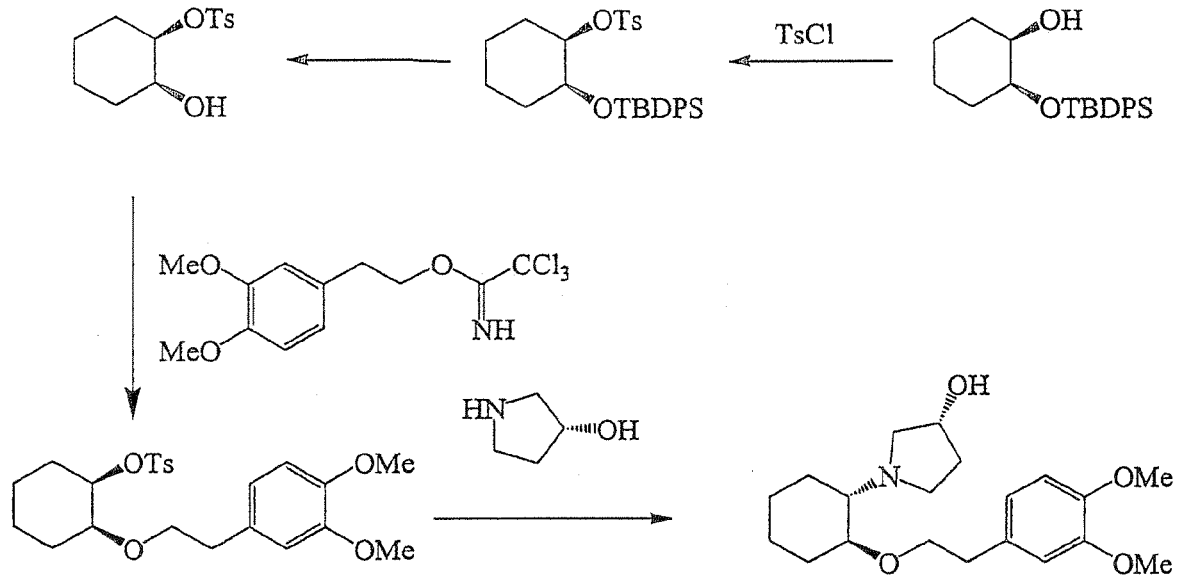

OTs
OH
OTs
OTBDPS
TsCl
OH
OTBDPS
MeO
MeO
O
CCl3
NH
HN
OH
OTs
OMe
OMe
O
OH
N
OMe
OMe
O

Figure 158

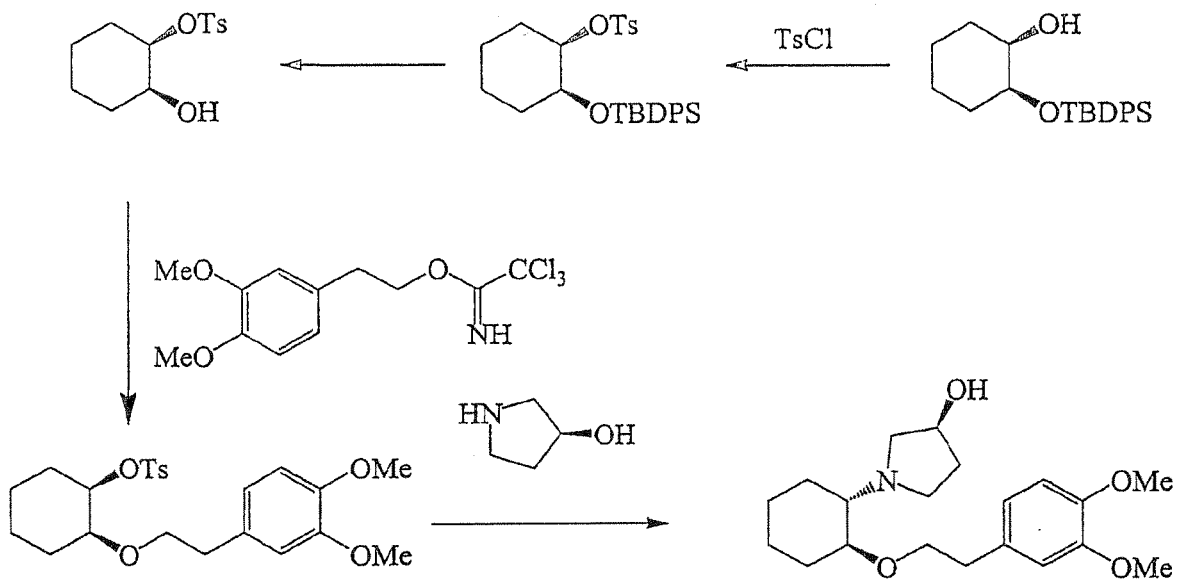

OTs
OH
OTs
OTBDPS
TsCl
OH
OTBDPS
MeO
MeO
O
CCl3
NH
HN
OH
OTs
OMe
OMe
O
OH
N
OMe
OMe
O

Figure 159

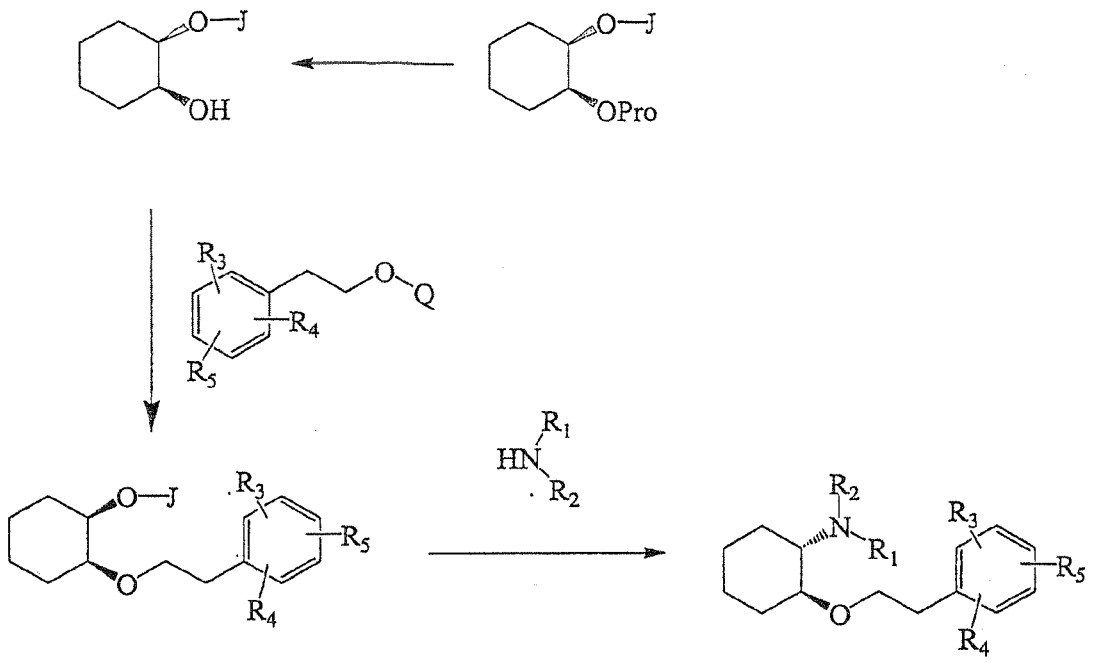


Figure 160

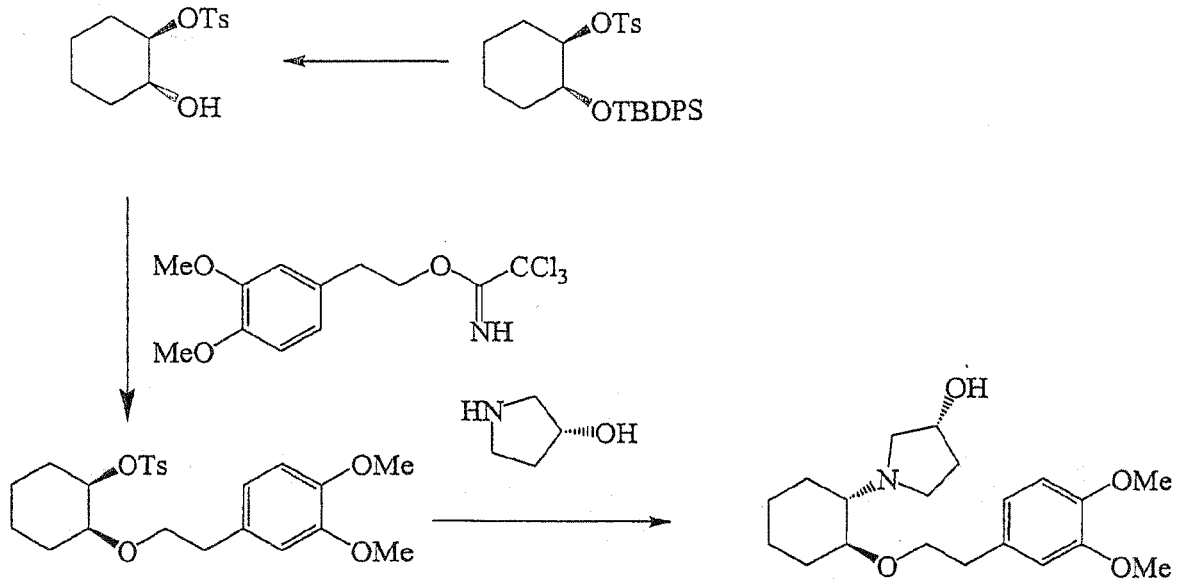

OTs
OH
OTs
OTBDPS
MeO
MeO
O
CCl3
NH
HN
OH
OTs
OMe
OMe
O
OH
N
OMe
OMe
O

Figure 161

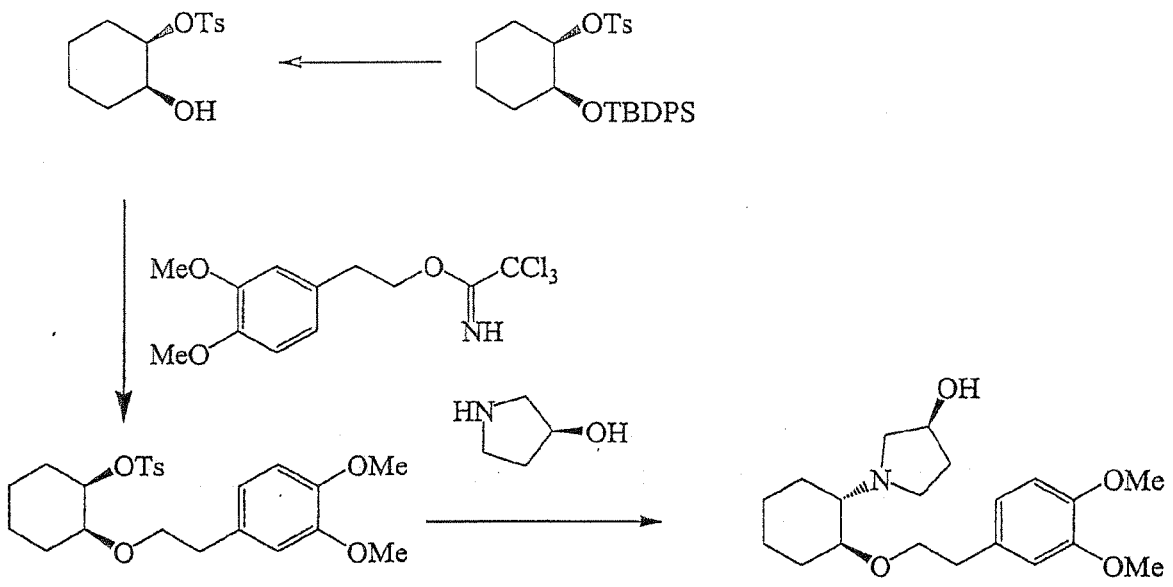

OTs
OH
OTs
OTBDPS
MeO
MeO
O
CCl3
NH
HN
OH
OTs
O
OMe
OMe
OH
N
O
OMe
OMe

Figure 162

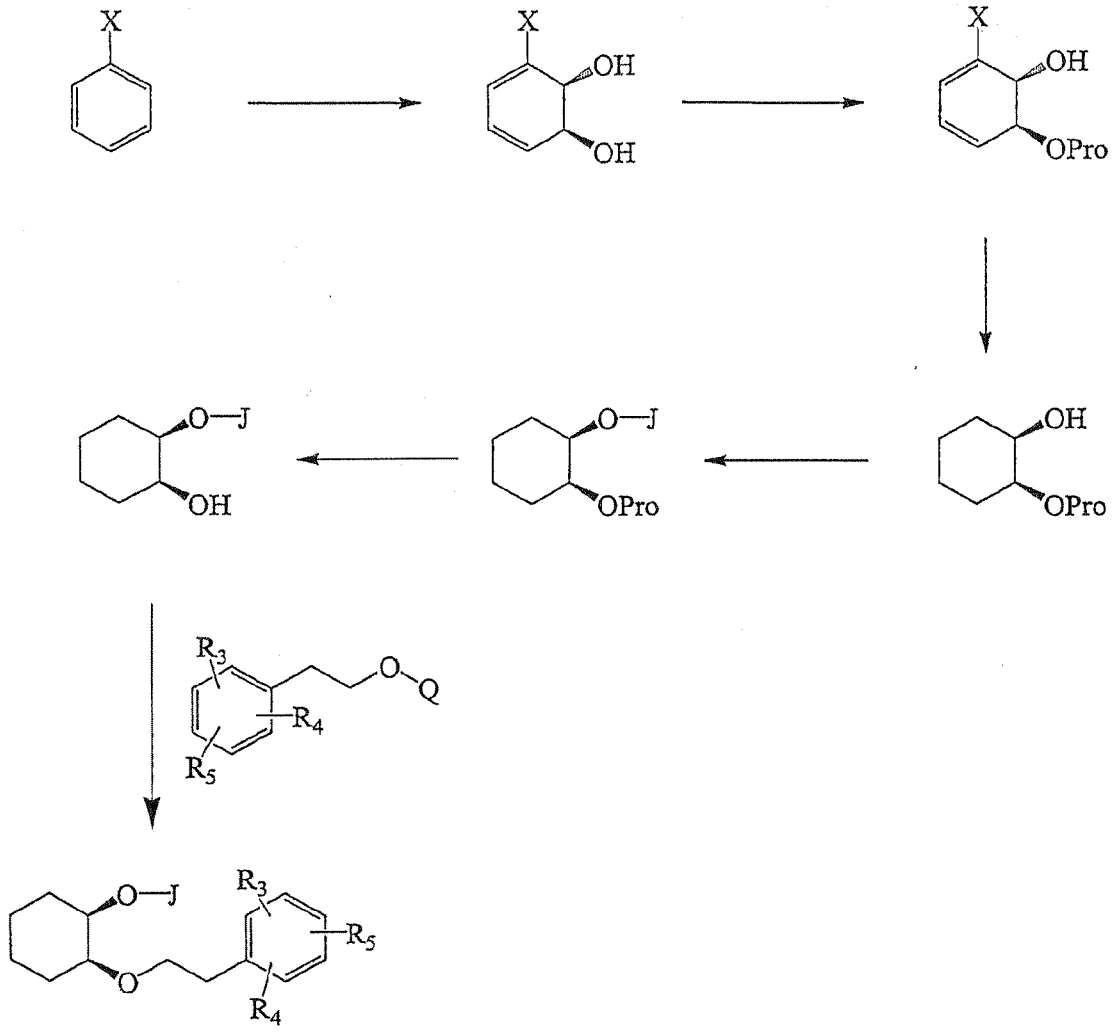


Figure 163

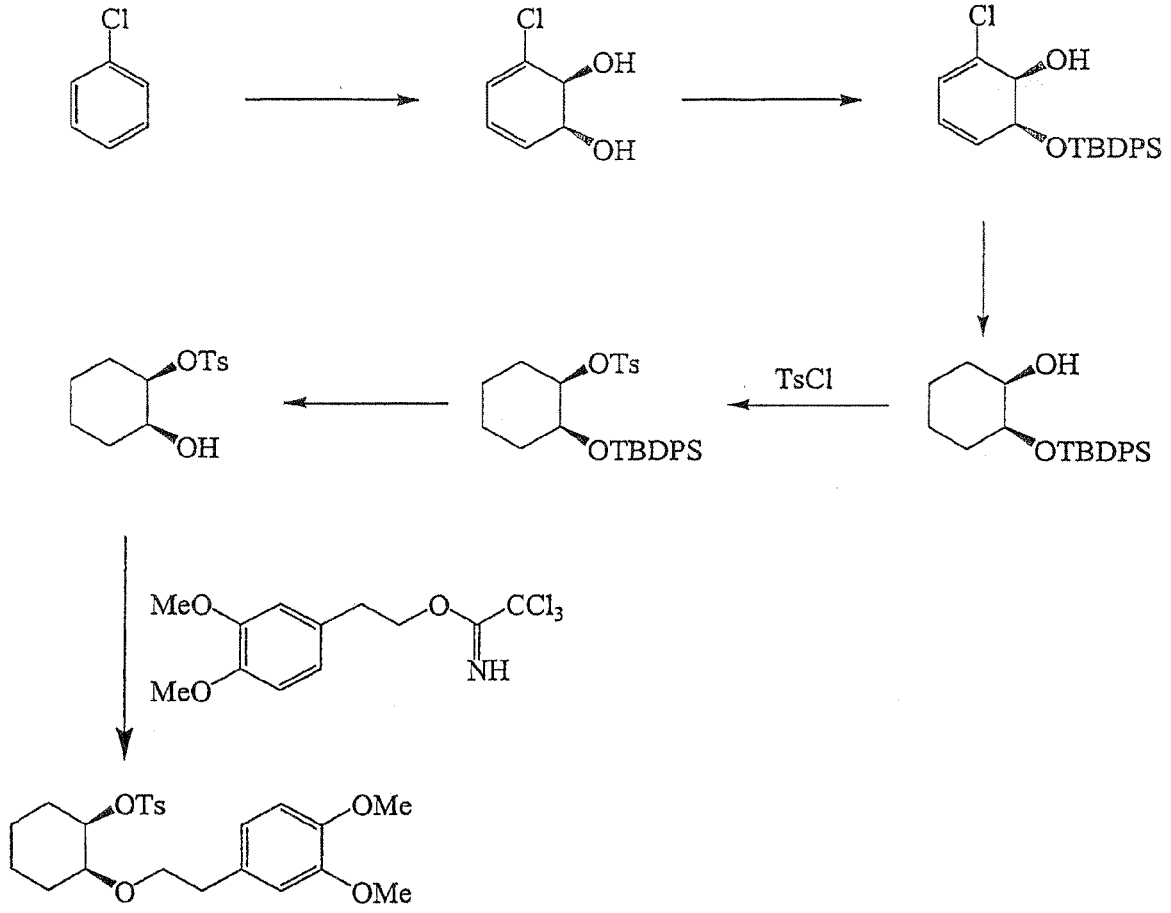

Cl
Cl
OH
OH
Cl
OH
OTBDPS
OH
OTBDPS
TsCl
OTs
OTBDPS
OTs
OH
MeO
MeO
O
CCl3
NH
OTs
O
OMe
OMe

Figure 164

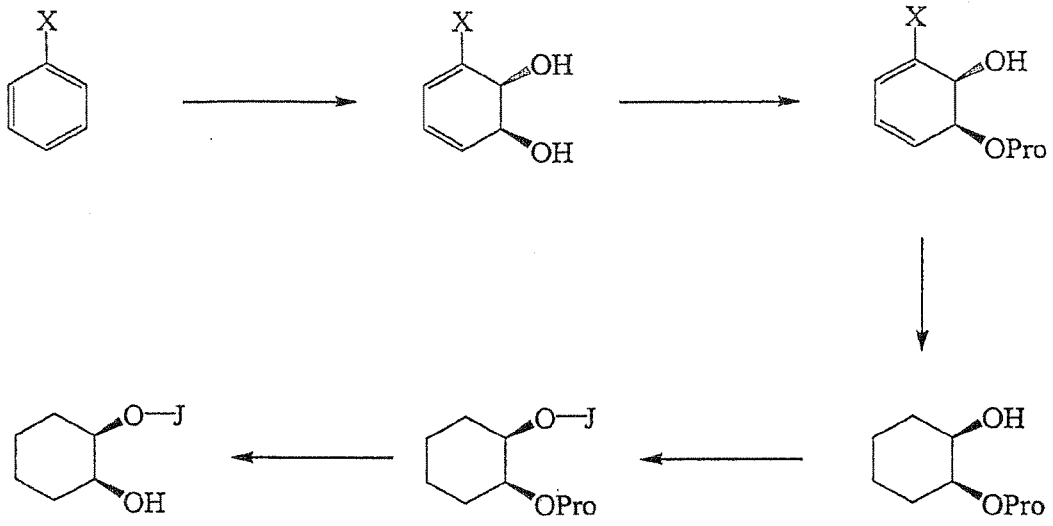


Figure 165

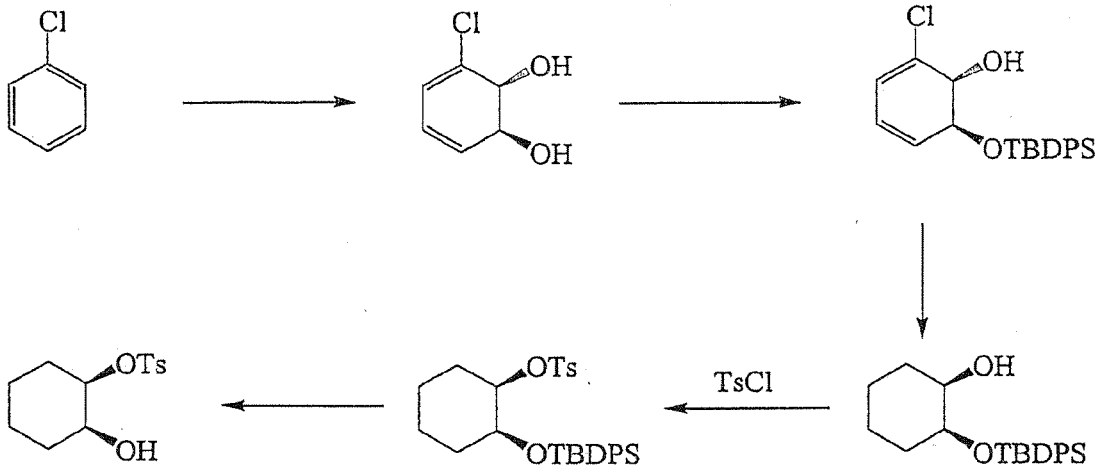


Figure 166

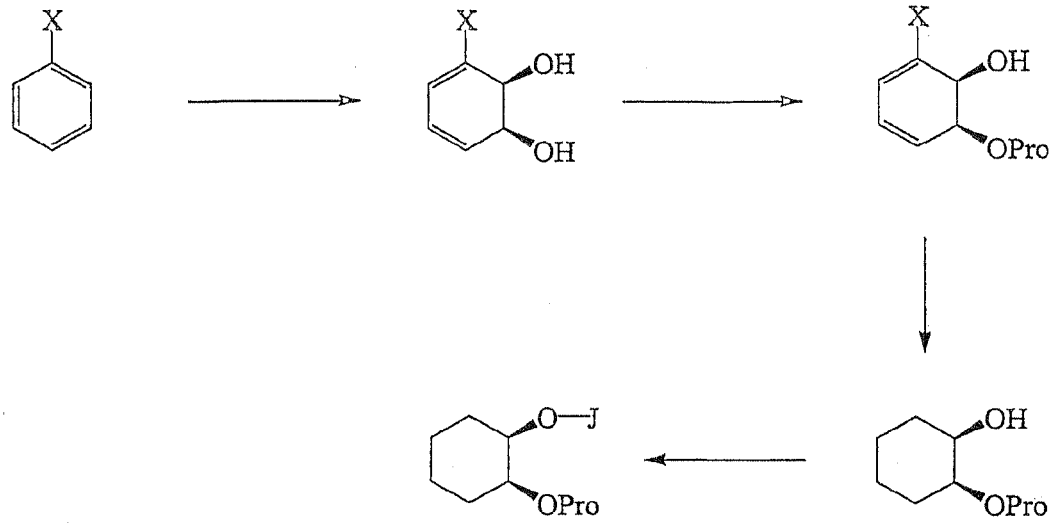


Figure 167

