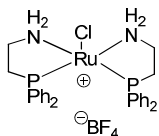
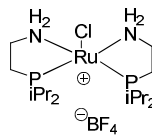


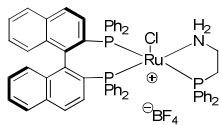
Cationic Ruthenium Catalysts



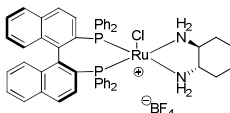
K44-0076
[RuCl(PGly)₂]BF₄, ≥97%
Chloro(bis(2-(diphenylphosphino)-ethanamine))ruthenium(II)tetrafluoroborate
 C₂₈H₃₂BClF₄N₂P₂Ru; F.W: 681.84



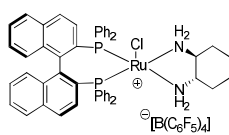
K44-0121
[RuCl(P*i*Pr)₂(CH₂)₂NH₂]BF₄, ≥97%
Chloro(bis(2-(diisopropylphosphino)-ethanamine))ruthenium(II)
 C₁₆H₄₀BClF₄N₂P₂Ru; F.W: 546.14



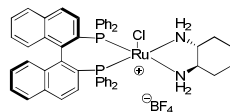
K44-0072
[RuCl(*R*-BINAP)(PGly)]BF₄, ≥97%
Chloro((*R*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)(2-(diphenylphosphino)-ethanamine)ruthenium(II)tetrafluoroborate
 C₅₈H₄₈BClF₄NP₃Ru; F.W: 1075.26



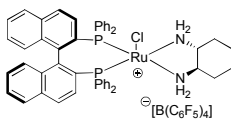
K44-0129
[RuCl(*S*-BINAP)(*S,S*-dach)]BF₄, ≥97%
Chloro((*S*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*S,S*)-cyclohexane-1,2-diamine)ruthenium(II)tetrafluoroborate
 C₅₀H₄₆BClF₄N₂P₂Ru; F.W: 960.19



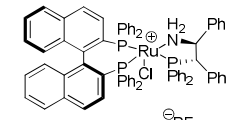
K44-0130
[RuCl(*S*-BINAP)(*S,S*-dach)]FABA, ≥97%
Chloro((*S*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*S,S*)-cyclohexane-1,2-diamine)ruthenium(II) tetrakis(pentafluorophenyl)borate
 C₇₄H₄₆BClF₂₀N₂P₂Ru; F.W: 1552.42



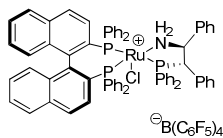
K44-0065
[RuCl(*R*-binap)(*R,R*-dach)]BF₄, ≥97%
Chloro((*R*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*R,R*)-cyclohexane-1,2-diamine)ruthenium(II)tetrafluoroborate
 C₅₀H₄₆BClF₄N₂P₂Ru; F.W: 960.19



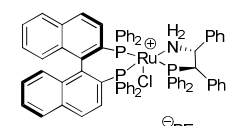
K44-0068
[RuCl(*R*-binap)(*R,R*-dach)]FABA, ≥97%
Chloro((*R*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*R,R*)-cyclohexane-1,2-diamine)ruthenium(II)tetrakis(pentafluorophenyl)borate
 C₇₄H₄₆BClF₂₀N₂P₂Ru; F.W: 1552.42



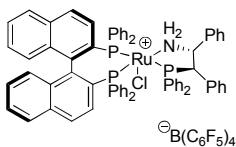
K44-0074
Chloro((*S*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*S,S*)-2-(diphenylphosphino)-1,2-diphenylethanamine)ruthenium(II)-tetrafluoroborate, ≥97%
 C₇₀H₅₆BClF₄NP₃Ru; F.W: 1227.45



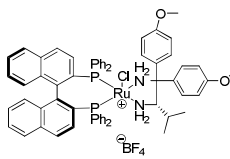
K44-0132
Chloro((*S*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*S,S*)-2-(diphenylphosphino)-1,2-diphenylethanamine)ruthenium(II)-tetrakis(pentafluorophenyl)borate
 C₉₄H₅₆BClF₂₀NP₃Ru; F.W: 1819.68



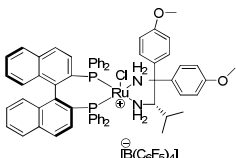
K44-0131
Chloro((*R*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*R,R*)-2-(diphenylphosphino)-1,2-diphenylethanamine)ruthenium(II)-tetrafluoroborate
 C₇₀H₅₆BClF₄NP₃Ru; F.W: 1227.45



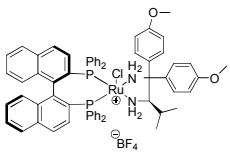
K44-0126
Chloro((*R*)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl)((*R,R*)-2-(diphenylphosphino)-1,2-diphenylethanamine)ruthenium(II)-tetrakis(pentafluorophenyl)borate
 C₉₄H₅₆BClF₂₀NP₃Ru; F.W: 1819.68



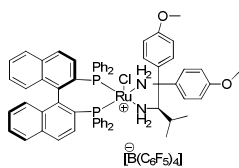
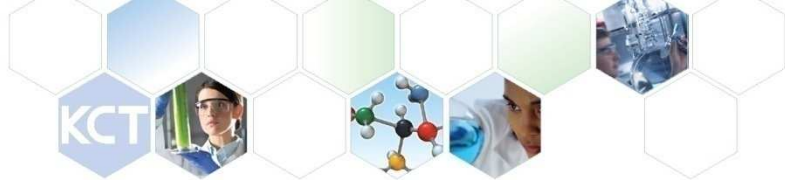
K44-0098
[RuCl(*S*-binap)(*S*-daipen)]BF₄, ≥97%
Chloro((*S*)-(-)-2,2'-bis[diphenylphosphino]-1,1'-binaphthyl)((*S*)-1,1-bis(4-methoxyphenyl)-3-methylbutane-1,2-diamine)-ruthenium(II)tetrafluoroborate
 C₆₃H₅₈BClF₄N₂O₂P₂Ru; F.W: 1160.40



K44-0099
[RuCl(*S*-binap)(*S*-daipen)]FABA, ≥97%
Chloro((*S*)-(-)-2,2'-bis[diphenylphosphino]-1,1'-binaphthyl)((*S*)-1,1-bis(4-methoxyphenyl)-3-methylbutane-1,2-diamine)ruthenium(II)tetrakis(pentafluorophenyl)borate
 C₈₇H₅₈BClF₂₀N₂O₂P₂Ru; F.W: 1752.70



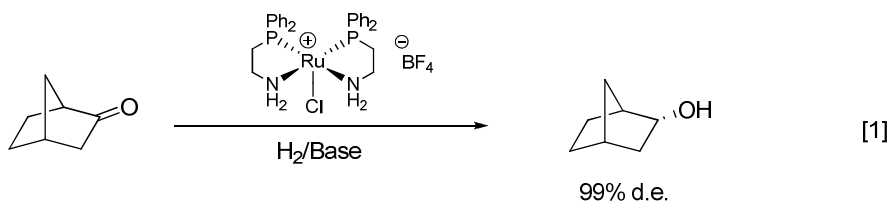
K44-0127
Chloro((*R*)-(-)-2,2'-bis[diphenylphosphino]-1,1'-binaphthyl)((*R*)-1,1-bis(4-methoxyphenyl)-3-methylbutane-1,2-diamine)-ruthenium(II)tetrafluoroborate
 C₆₃H₅₈BClF₄N₂O₂P₂Ru; F.W: 1160.40



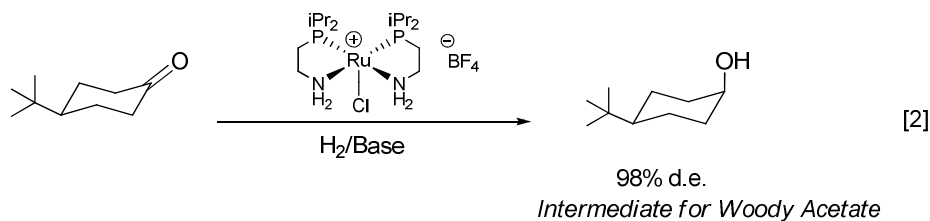
K44-0128
Chloro((R)-(-)-2,2'-bis[diphenylphosphino]-1,1'-binaphthyl)((R)-1,1-bis(4-methoxyphenyl)-3-methylbutane-1,2-diamine)-ruthenium(II)tetrakis(pentafluorophenyl)borate
 $C_{87}H_{58}BClF_{20}N_2O_2P_2Ru$; F.W.: 1752.70

Ruthenium catalysts are the preferred systems for hydrogenation of ketones and imines because of their high activity and selectivity. Kanata Chemical Technologies has developed new classes of cationic Ru catalysts using various ancillary ligands including diphosphines, aminophosphines, and diamines. Stellar loading with typical 100% conversion are observed and higher stereoselectivities are obtained in comparison to their neutral analogues.

Asymmetric Hydrogenation of Norcamphor:



Asymmetric Hydrogenation of *tert*-Butylcyclohexanone:



Enantioselective Hydrogenation of Ketones:

