Dedicated to Full Member of the Russian Academy of Sciences B.A. Trofimov on the 65th Anniversary of His Birth

Catalytic Hydrogenation of Acetophenone with Hydrogen Transfer over Chiral Diamine Rhodium(I) Complexes

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Abstract - The catalytic activity and stereoselectivity of Rh(I) complexes with C_2-symmetric chiral diamines, (4*S*,5*S*)-3,4-isopropylidenedioxy-1,4-butanediamine and (4*S*,5*S*)-*N*,*N*,N′,*N*′-tetramethyl-3,4-isopropylidenedioxy-1,4-butanediamine [skeletal analogs of 2,3-dihydroxy-2,3-*O*-isopropylidene-1,4-bis(diphenylphosphino)-butane (DIOP)], were studied in hydrogen transfer from 2-propanol to acetophenone in the presence of KOH or *t*-BuOK. The product, (*S*)-(–)-2-phenylethanol, was thus obtained with an optical yield of 67%. Covalent chloride rhodium complexes with the above ligands give rise to the same stereoisomer, whereas the opposite stereoselectivity is observed under catalysis by cationic trifluoromethanesulfonate rhodium(I) complexes. X-Ray phase analysis showed formation of nanosize particles in the precipitate of metallic rhodium.