NEW 1,2-AMINOALCOHOL DERIVATIVE LIGANDS OF RHODIUM ASYMMETRIC HYDROGENATION CATALYSTS

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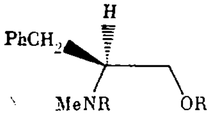
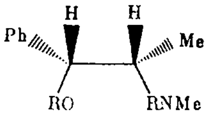
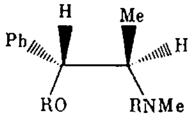
We have obtained new chiral phosphinaminophosphinite ligands (I)-(III) for rhodium complexes used for asymmetric hydrogenation [1, 2] starting from 2S-(IV), 1R,2S-(V), and 1S,2S-(VI) by their phosphorylation by Ph_2PCl in benzene in the presence of NEt_3 at 20°C in an argon atmosphere.



(I), (IV)



(II), (V)



(III), (VI)

R = PPh_2, (I) — (III); R = H (IV) — (VI).

(I)-(III) are transparent, viscous oils which are readily oxidized in the air. ^{31}P NMR spectra (δ, ppm): 114.9 and 59.8 (I), 112.5 and 64.6 (II) and 110.5 and 63.1 (III). The Rh[(COD)-(I)]ClO_4 complex, where COD is 1,5-cyclooctadiene, was obtained according to Schrock and Osborn [3]. The hydrogenation of N-acetylaminocinnamic acid (VII) to give N-acetylphenylalanine (VIII) was carried out in situ with $[Rh(COD)Cl]_2$ and (I), (II), or (III) in 1:1 benzene–methanol at 20°C, [Rh] = 0.08 mmole, (VII)/catalyst = 35 at 100 atm and in the presence of the catalytic complex under the same conditions with [Rh] = 0.1 mmole, (VII)/catalyst = 35 at 1 atm. The optical yields, p (%), and configurations of (VIII) upon in situ hydrogenation in the presence of (I), (II), and (III) were 4% (R), 2% (R), and 4% (R), respectively. In the presence of the complex with (I), p was 51% and the configuration was R.

LITERATURE CITED

1. V. A. Pavlov and E. I. Klabunovskii, Izv. Akad. Nauk SSSR, Ser. Khim., 2015 (1983).
2. E. Cesarotti, A. Chiesa, and G. D'Alfonso, Tetrahedron Lett., No. 23, 2995 (1982).
3. R. R. Schrock and J. A. Osborn, J. Am. Chem. Soc., 93, 2397 (1971).

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