



Rh(I) AND Ir(I) CATALYZED ASYMMETRIC HYDROGENATION WITH NEW BULKY PHOSPHITE AND PHOSPHORAMIDITE LIGANDS

I.S. Mikhel^a, S.E. Lyubimov^b, K.P. Birin^a, V.A. Davankov^b

^aA.N. Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Moscow, Russia

^bA.N. Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences, Moscow, Russia

Enantioselective homogenous hydrogenation catalyzed by chiral transition metal complexes has become one of the most widespread methods for obtaining of optically active organic compounds, more commonly utilizing complexes based on Ru, Rh or Ir and including phosphorous-containing chiral ligands. Tetrahydro-1*H*-benzodiazepinones represent a novel, currently developed class of bioactive compounds displaying antiasthmatic, antitumor, and neuroprotective activities. New bulky phosphite and phosphoramidite (L1 - L4) ligands were synthesized and tested in the asymmetric Rh-catalyzed hydrogenation of a series of substrates, including dimethyl itaconate, *a*- and *b*-dehydroamino acid derivatives and in the Ir-catalyzed hydrogenation of 2-methylindole (Figure 1).¹ In Ir-catalyzed asymmetric hydrogenation of a series of 4-*R*-1,3-dihydro-2*H*-1,5-benzodiazepin-2-ones up to 74% *ee* was achieved.^{2,3}

The structure of obtained compounds was determined based on one- and two-dimensional NMR spectroscopy data (¹H, ¹³C, ³¹P, ¹H-¹H COSY, ¹H-¹H ROESY, ¹H-¹³C HSQC and ¹H-¹³C HMBC).

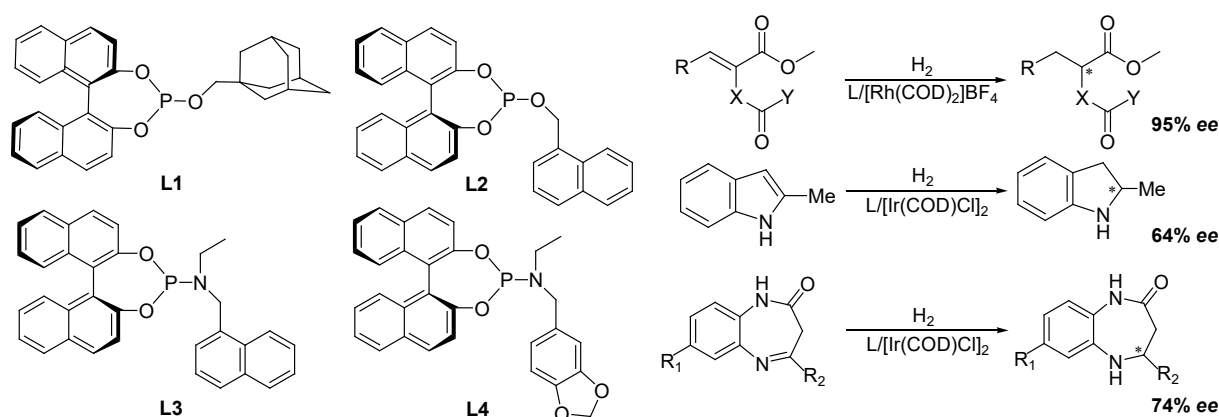


Figure 1. Rh(I) and Ir(I) catalyzed hydrogenation of different substrates with ligands L1-L4.

[1] M.V. Sokolovskaya, S.E. Lyubimov, I.S. Mikhel, K.P. Birin, V.A. Davankov, *J. Organomet. Chem.*, **2018**, 861, 230-233.

[2] M.V. Sokolovskaya, S.E. Lyubimov, I.S. Mikhel, K.P. Birin, V.A. Davankov, *Russ. Chem. Bull.*, **2018**, 67, 260-264.

[3] S.E. Lyubimov, M.V. Sokolovskaya, I.S. Mikhel, K.P. Birin, V.A. Davankov, *Russ. Chem. Bull.*, **2019**, 68, 1429-1434.

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e-mail: i_mikhel@rambler.ru