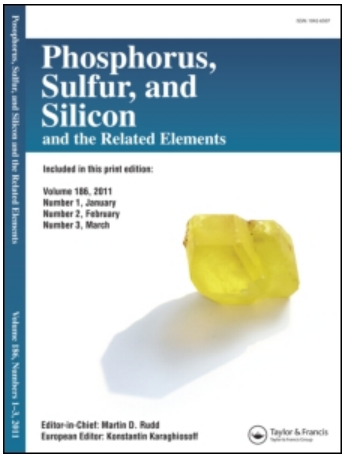

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Synthesis of Chiral 3-(o -Diphenylphosphinophenyl)-Butanoic Acid and Its Palladium Complex Catalyzed Asymmetric Allylic Alkylation

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SYNTHESIS OF CHIRAL 3-(*o*-DIPHENYLPHOSPHINOPHENYL)-BUTANOIC ACID AND ITS PALLADIUM COMPLEX CATALYZED ASYMMETRIC ALLYLIC ALKYLATION

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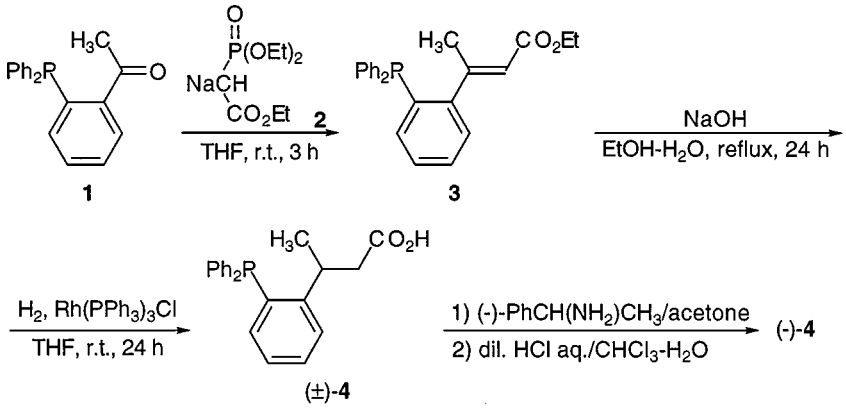
We report on the synthesis of a novel type of chiral phosphine ligands bearing carboxyl group and have shown that the carboxyl group plays an important role in the asymmetric induction.[1] We now report synthesis of chiral 3-(*o*-diphenylphosphinophenyl)butanoic acid and its palladium complex catalyzed asymmetric allylic alkylation.

Reaction of (*o*-diphenylphosphino)acetophenone **1** with triethyl sodiophosphonoacetate **2** gave ethyl 3-(*o*-diphenylphosphinophenyl)-but-2-enoate **3** in 89% yield. Alkaline hydrolysis of **3** and subsequent hydrogenation in the presence of $Rh(PPh_3)_3Cl$ under H_2 atmosphere



SCHEME 1

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gave racemic 3-(*o*-diphenylphosphinophenyl)butanoic acid (±)-**4** in 67% yield. Resolution of (±)-**4** with (−)-α-methylbenzylamine gave the optically active (−)-**4**, $[\alpha]_{D^{34}} = -10.51$ (c 1.7, $CHCl_3$).

Reaction of 3-acetoxy-1,3-diphenyl-1-propene with **2** in the presence of catalytic amount of $Pd(OAc)_2$·(−)-**4** complex (1.5% mol) gave the allylic alkylation product in quantitative yield (38% ee).

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[1] T. Minami, Y. Okada, T. Otaguro, S. Tawaraya, T. Furuichi, and T. Okauchi, *Tetrahedron: Asymmetry*, **6,** 2469 (1995).