

THE FIRST SYNTHESIS AND CATALYTIC PROPERTIES OF HYDROPHOSPHORANES SERIES BASED ON (+)-3-CARENE

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ABSTRACT. The present study focuses on the synthesis of novel chiral hydrophosphoranes derived from natural monoterpene (+)-3-carene and the evaluation of their catalytic activity in Pd-catalyzed asymmetric allylic substitution reactions. The synthesized compounds were characterized by IR, ^1H , ^{13}C , and ^{31}P NMR spectroscopy, as well as by elemental analysis. The hydrophosphoranes were found to coordinate with Pd(II), exhibiting P,N-bidentate coordination behaviour. Their catalytic properties were investigated in the allylic alkylation and amination of (*E*)-1,3-diphenylallyl acetate. The catalytic systems demonstrated significant stereoselectivity, with enantiomeric excesses reaching 92% under optimized conditions. In the allylic alkylation reaction, the *S* enantiomer was preferentially formed irrespective of the solvent and cationic complex employed. These findings indicate that carene-derived spiro-hydrophosphoranes constitute promising chiral ligands for asymmetric Pd-catalyzed transformations.

Keywords: monoterpene (+)-3-carene, hydrophosphorane, Pd-catalyzed reaction, asymmetric reaction.