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2,2'-Binaphthylene phosphorochloridite (BINOL-PCI) as a bulky and efficient reagent for the conversion of primary and secondary alcohols into iodides, and tertiary alcohols stereo- and/or regioselectively into olefin(s)

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Abstract: Primary and secondary alcohols were transformed in high yield to corresponding iodides by 4-chloro-3,5-dioxaphosphacyclohepta [2,1- α ; 3,4- α'] dinaphthalene (BINOL-PCI) at room temperature. The tertiary alcohols formed corresponding alkenes by stereo- and/or regioselective elimination reactions. (E)-1,2-Diphenyl-1-propene and 2,3-diphenyl-1-propene were stereoselectively obtained from 1,2-diphenyl-2-propanol, as representative. No (Z)-1,2-diphenyl-1-propene was observed. 2-Methyl-1-phenylcyclopentene and 3-methyl-2-phenylcyclopentene were regioselectively obtained from 2-methyl-1-phenylcyclopentanol. ^{13}C chemical shifts for the α -methylene carbon of some alkyl iodides empirically calculated through a very simple additive relationship lead to similar or even better values than the reported values. All primary alkyl iodides showed the iodine heavy atom effect on the α -methylene carbon chemical shift.

Key Words: Alkyl iodide, 2,2'-dihydroxy-1,1'-dinaphthalene (BINOL), 2,2'-binaphthylene phosphorochloridite (BINOL-PCI), stereoselective, anti-E2 elimination reaction, heavy atom effect.

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