REACTION OF LANTHANIDE DERIVATIVES WITH VINYL BROMIDE IN THE PRESENCE OF COBALT CHLORIDE

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The reactions of PhMgBr with vinyl bromide in the presence of 5 mole % of $CoCl_2$ (the Kharasch reaction) for 12 h at 20°C gives styrene (I) in a yield of 56-75% and biphenyl (17%) [1].

We studied the cross-combination reaction of PhLnI (Ln = Yb, Eu, Sm, Ce), obtained in situ by the action of PhI on zero-valent lanthanides in THF, with vinyl bromide under the Kharasch reaction conditions. For Ln = Yb, the yield of (I) is 90% after 2 h (biphenyl is a side product). In the absence of $CoCl_2$, styrene is not formed. The reactivity decreases sharply on transition to other lanthanides: after 2 h, the yield of (I) was 10% for Eu and 4% for Sm; with Ce, the cross-combination reaction does not proceed. However, the yield of biphenyl in all cases does not exceed 10% (all yields are based on PhI). Surprisingly, (I) was formed in the absence of $CoCl_2$, in the reactions with PhEuI and PhSmI, although in a low yield (2-3%). The difference in the behavior of the phenyl derivatives of lanthanides in this reaction may be due to their ability to reduce $CoCl_2$.

Compound C_6F_5YbBr, obtained by the action in situ of C_6F_5Br on a zero-valent ytterbium in THF, undergoes the reaction with vinyl bromide under the same conditions. The yield of $C_6F_5CH{=}CH_2$ (II) is 80%. Thus, this reaction is of interest as a method for the synthesis of (II) [2]. We should note that the oxidative addition of lanthanide with the participation of aryl bromide was carried out for the first time.

LITERATURE CITED

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