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LETTERS
TO THE EDITOR

Metallation of 1,3-Diphenyl-2-benzylpropene with Diphenylytterbium

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Metallation of 1,3-diphenyl-2-benzylpropene with *n*-butyllithium yields dilithium salt of tribenzylidenemethane [1, 2]. Several examples of complexes of early transition metals (Zr, Ta) with tribenzylidenemethane dianion are known [3, 4], but no attempts to prepare such complexes with Group II or III elements, in particular, with rare-earth elements, were made up to now. In this connection, we examined some routes to organoytterbium derivatives containing tribenzylidenemethane dianion.

We found that the complex of ytterbium with tribenzylidenemethane dianion formed by the exchange reaction of YbI_2 with tribenzylidenemethane dilithium salt exhibits low reactivity and does not further react with 3-methylbenzyl bromide or with organotin or organogermanium halides.

Therefore, we attempted metallation of 1,3-diphenyl-2-benzylpropene with organic derivatives of Yb(II) which, as shown by the example of PhYbI and MeYbI, react with CH and NH acids RH (pK_a 18–26) to form organoytterbium compounds RYbI [5]. Evidently, the CH acidity of 1,3-diphenyl-2-benzylpropene is unsufficient for its metallation with both these reagents. Nevertheless, the desired result is achieved by the reaction of 1,3-diphenyl-2-benzylpropene with diphenylytterbium prepared by the reaction of Yb(0) with Ph_2Hg [6]. Two methods of metallation in THF were tested: addition of Ph_2Yb prepared in advance to a solution of 1,3-diphenyl-2-benzylpropene and addition of ytterbium metal to a mixture of 1,3-diphenyl-2-benzylpropene with Ph_2Hg (i.e., use of Ph_2Yb generated *in situ*). After the addition of triphenyltin chloride to the reaction mixture, in both cases the distannyl derivative of 1,3-diphenyl-2-benzylpropene, $(PhCHSnPh_3)_2C{=}CHPh$, was isolated in 40% and 17% yield, respectively. This result, suggesting transformation of 1,3-diphenyl-2-benzylpropene into tribenzylidenemethane dianion under the action of Ph_2Yb, means that organoytterbium(II) derivatives can be prepared by metallation of CH acids with diphenylytterbium.

All the reactions involving organolithium and organolanthanide derivatives were carried out under dry argon in Schlenk vessels. Organic solvents of pure grade were refluxed over sodium/benzophenone and distilled just before the experiment. 1,3-Diphenyl-2-benzylpropene was prepared as described in [7]. Solutions of YbI_2 and organoytterbium compounds (RYbI, Ph_2Yb) were prepared in absolute THF. The metal was preliminarily activated by the addition of CH_2I_2 [6, 8, 9].

$(PhCHSnPh_3)_2C{=}CPh$, mp 204–207°C (from benzene). Found, %: C 69.39; H 4.87; Sn 24.15. $C_{57}H_{48}Sn_2$. Calculated, %: C 70.92; H 4.89; Sn 24.48.

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