USE OF ALUMINUM OXIDE AS A HYDROALUMINATING AGENT

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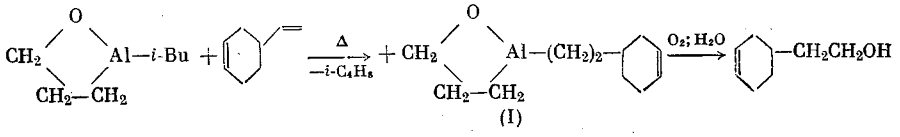
It is known that trialkyl- and dialkylaluminum hydrides are used for the hydroalumination of olefins [1]. There are no data in the literature on the use of aluminum oxides for this purpose.

We have found that Al-isobutylcylcopentanaluminum oxide, obtained by the method of [2], hydroaluminates 4-vinylcyclohexene (150°C, 8 h), forming isobutylene and Al-ethylcyclohexenylcyclopentanaluminum oxide (I) in 100% yield. (Found: C 59.6; H 10.8; Al 18.9%. $C_7H_{15}AlO$. Calculated: C 59.22; H 10.64; Al 18.97%).



Oxidation of (I) with oxygen with subsequent hydrolysis gave 1,3-propandiol and 2-(3-cyclohexenyl)ethanol [3], bp 84-86° (3 mm); n_D^{20} 1.4832.

The investigated reaction reveals a way of using aluminum oxide as an olefin hydroaluminating agent.

LITERATURE CITED

1. A. N. Nesmeyanov and R. A. Sokolik, Methods of Heteroorganic Chemistry. Boron, Aluminum, Gallium, Indium, Thallium [in Russian], Nauka, (1964).
2. L. I. Zakharkin and L. A. Savina, Izv. Akad. Nauk SSSR, Otd. Khim. Nauk, 824 (1962).
3. V. P. Vur'ev, G. A. Gailyunas, and G. A. Tolstikov, Zh. Obshch. Khim., 42, 2111 (1972).

HIGH ACTIVITY OF $MoCl_5$ IN CLEAVAGE OF THE Si–C BOND IN TETRAALKYL- AND ARYLSILANES

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Compounds of transition metals of a high degree of oxidation are very inert in relation to the Si–Alk bond [1], with the exception of metals of the Pt group. The unexpectedly high activity of $MoCl_5$ in cleavage of Si–Alk and Si–Ph bonds is reported in this paper. Thus, Me_4Si, Me_3SiEt, Me_3SiBu, and Me_3SiPh react easily with $MoCl_5$ at 20°C in such solvents as nitrobenzene, benzene, chloroform, and formamide. The solvents in their activating effect are arranged in the sequence: nitrobenzene > benzene > formamide > chloroform. In 2 h at 10° Me_4Si reacts by 72% with $MoCl_5$ (0.25 M in $CHCl_3$) with the formation of mainly Me_3SiCl and MeH. The reaction does not go in pentane, ether, and mesitylene at 20°. Cleavage of both Me and Et groups is observed upon reaction of $MoCl_5$ and Me_3SiEt (formation of MeH, EtH, MeCl, EtCl, and the corresponding chlorosilanes). The phenyl group is cleaved predominantly in Me_3SiPh.

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