

Preliminary communication

Disproportionation of dimethylaluminium acetylacetonate by Lewis bases

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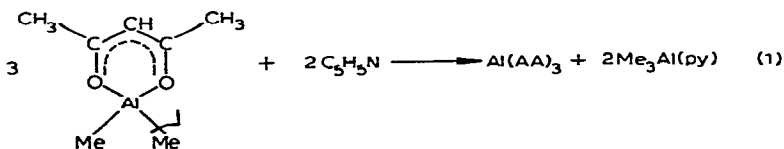
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Reactions of alkylaluminium acetylacetonates with Lewis bases are of particular interest because such compound systems have often been constituents of catalytic systems.

According to Kroll *et al.*¹, alkylaluminium acetylacetonates yield no stable complexes with Lewis bases such as ether, phosphine, tetrahydrofuran, and tertiary amines.

This study is concerned with complexing dimethylaluminium acetylacetonate with pyridine and with benzophenone. A disproportionation reaction represented by eqn. (1) was found to occur as supported by NMR evidence (Table 1).



(AA = acetylacetonate and py = pyridine)

TABLE 1^a

Compound	Chemical shift τ (ppm) ^b		
	CH ₃ — (in ring)	—CH—	CH ₃ —Al
Al(AA) ₃	8.05	4.56	
Me ₂ Al(AA)	8.18	4.75	10.31
Me ₃ Al(py)			10.20
Al(AA) ₃ + 2Me ₃ Al(py)	8.08	4.57	10.20
3Me ₂ Al(AA) + 2C ₅ H ₅ N	8.09	4.55	10.20

^a The spectra were run in toluene as solvent on a JEOL-C-60H (60 MHz) spectrometer at room temperature. ^b The shift was measured by taking τ 7.66 as the signal due to toluene methyl hydrogens.

Dimethylaluminium acetylacetonate reacted with pyridine at room temperature at a mole ratio of 3/2. After 5.9 mmoles of pyridine had been added to 8.9 mmoles of dimethylaluminium acetylacetonate, in a few hours crystals were deposited from the yellow solution. The crystals were separated from the mother liquor in a nitrogen atmosphere. The resulting aluminium triacetylacetonate, $\text{Al}(\text{AA})_3$, was found to melt at $192\text{--}197^\circ$ ².

As evident from the data presented in Table 1, eqn. (1) is irreversible. Addition of a trimethylaluminium-pyridine complex to the aluminium triacetylacetonate was found to have no effect on the chemical shifts of the compounds.

Again, benzophenone was found to effect disproportionation of dimethylaluminium acetylacetonate to aluminium triacetylacetonate.

Studies on reactions of methylaluminium acetylacetonate chloride [$\text{MeClAl}(\text{AA})$] and aluminium acetylacetonate dichloride [$\text{Cl}_2\text{Al}(\text{AA})$] with Lewis bases are in progress.

REFERENCES

- 1 W.R. Kroll, J. Kuntz and E. Birnbaum, *J. Organometal. Chem.*, 26 (1971) 313.
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