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$Mg(C_7H_{13}N_2)_2$ – a Main Group Metal Vinamidine Complex

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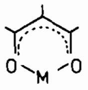
Metal β-diketonates (**1**) have been subject of numerous investigations both in the main group element and in transition metal chemistry [1]. Only a limited number of vinamidine metal chelates (**2**) has been described, all of them containing transition metal centres [2, 3]. In the course of our investigations on main group element chelates [4] we report the synthesis and some properties of a vinamidine magnesium complex.

Experimental

$Mg(C_7H_{13}N_2)_2$ (4)

2.52 g (0.02 mol) $C_7H_{14}N_2$ (**3**) [5] in 20 ml ether were added to 15.6 ml (0.01 mol) of a 0.64 M $Mg(CH_3)_2$ ether solution in the course of 20 min. The resulting solid was filtered off and dried *in vacuo*, 58% yield. Subl. at 100 °C (0.1 torr), pale yellow crystals. ^1H NMR (CD_2Cl_2): δ CCH_3 1.97, δ NCH_3 2.97, δ CH 4.47 ppm. ^{13}C NMR (C_6D_6): δ $C\mathit{C}H_3$ 21.46, δ NCH_3 35.95, δ CH 93.91, δ $\mathit{C}CH_3$ 169.37 ppm. MS (70 eV): *m/e* (%) 274 (54) [M^+], 259 (12) [$M^+ - CH_3$], 244 (4) [$M^+ - 2CH_3$], 149 (46) [$M^+ - C_7H_{13}N_2$], 124 (46) [$C_7H_{13}N_2^+$], 109 (12) [$C_7H_{13}N_2^+ - CH_3$], 95 (77) [$C_7H_{13}N_2^+ - NCH_3$], 56 (100) [$CH_3NCCH_3^+$]. *Anal.* Found (calc.): C, 60.77 (61.16); H, 9.3 (9.55); Mg, 9.05 (8.85)%.



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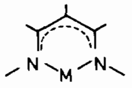

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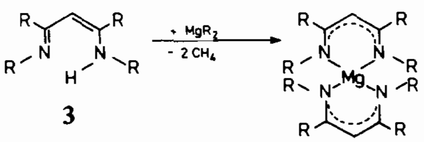

3

4

R = CH_3

Results

2-Methylamino(4-methylimino)-2-pentene (**3**), a tetramethylvinamidine [6], reacts with dimethylmagnesium to give the title compound **4** in moderate yield. **4** is well soluble in benzene and dichloromethane. The yellow colour observed on standing the solutions for some hours does not influence the NMR spectra. Vapour pressure osmometry shows this compound to be monomeric in these solvents as well as in the vapour phase as indicated by the mass spectrum.

These results are in marked contrast to those reported for the acetylacetonate complex. For $Mg(acac)_2$ molecular weights 28000 in dichloromethane have been observed [7] as well as intensive mass peaks corresponding to polymeric species in the mass spectrum [8]. Solvation by methanol [9] and other polar solvents [10] indicates the tendency to form $Mg(acac)_2L_2$ solvates of D_{2h} symmetry.

Apparently, the vinamidine complex **4** fails in doing so both as a consequence from changing the oxygen *versus* nitrogen donor atoms and from steric hindrance caused by the tetragonal planar arrangement of the NCH_3 groups well documented for vinamidine nickel complexes [2]. Thus, the title compound is more familiar with $Be(acac)_2$ than with its magnesium analogue.

Acknowledgements

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