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Crystallographic report

[*N*,*N*-Methylethylaminopropylalane]$_2$

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Dimeric and centrosymmetric [MeEtN(CH$_2$)$_3$AlH$_2$]$_2$ comprises aluminum centers, coordinated in a distorted trigonal bipyramidal fashion by three hydrogen atoms, one nitrogen atom and one carbon atom. The aluminum atoms are bridged by hydrogen atoms, creating a planar, four-membered Al$_2$H$_2$ ring. Copyright © 2005 John Wiley & Sons, Ltd.

KEYWORDS: crystal structure; aluminum; hydride

COMMENT

The chemistry of compounds containing Al–N bonds has flourished over the past several years due mainly to current interest in developing optimum AlN precursors.[1–3] The title compound **I** (Fig. 1) was prepared by reaction of MeEtN(CH$_2$)$_3$AlCl$_2$ with LiH and exists as dimeric and centrosymmetric molecules exhibiting trigonal bipyramidal coordinated aluminum atoms. A central, planar, four-membered Al$_2$H$_2$ ring is formed due to the brigding effect of the hydrogen atoms situated between the aluminum atoms. The nitrogen atom of the ligand molecule is coordinated to the aluminum atom creating a bipyramide (Al–N 1.985(3) Å).

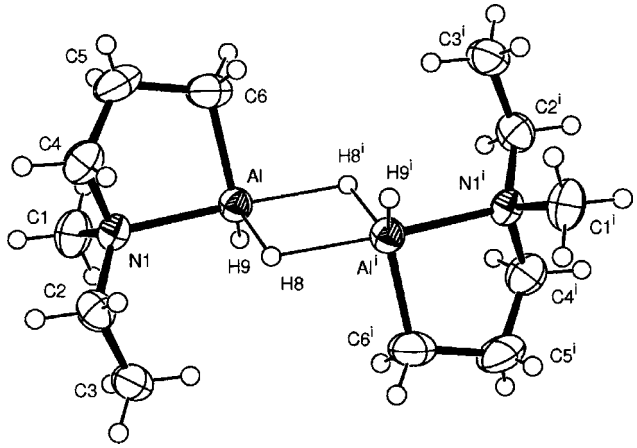

Figure 1. Molecular structure of **I**. Key geometric parameters: Al–N1 1.985(3), Al–C6 1.985(3), Al–H8 1.57(3), Al–H9 1.51(1), Al–Al^i 2.7870(14), Al–H8^i 1.93(1) Å; N1–Al–C6 87.44(11), N1–Al–H8 95(1), N1–Al–H9 98(1), C6–Al–H8 117(1), C6–Al–H9 125(1), H8–Al–H9 117(2)°. Symmetry operation: i = 1 − *x*, −*y*, −*z*.

EXPERIMENTAL

[MeEtN(CH$_2$)$_3$AlH$_2$]$_2$ (**I**) was prepared according to literature procedures.[1,2] To a solution of MeEtN(CH$_2$)$_3$AlCl$_2$ (2.0 g, 0.01 mol) in diethyl ether (30 ml), LiH (0.2 g, 0.02 mol) was added with continuous stirring. After stirring for 8 h, the solvent was removed. The solid obtained was collected and dried *in vacuo*. Yield: 0.5 g (35% yield). Intensity data for **I** were collected at 213 K on a Bruker SMART CCD diffractometer for a colorless crystal 0.20 × 0.25 × 0.30 mm^3; $C_{12}H_{32}Al_2N_2$, $M = 258.4$, monoclinic, $P2_1/n$, $a = 6.8281(1)$, $b = 15.7832(1)$, $c = 8.2090(1)$ Å, $\beta = 101.36(1)°$, $V = 867.35(4)$ Å^3, $Z = 2$ (dimers), 1808 unique data ($\theta_{max} = 27.2°$), $R = 0.059$ (1508 data with $[I \geq 2\sigma(I)]$), $wR = 0.162$ (all data). Programs used: SAINT, SHELXS97, SHELXL97, WinGX, and ORTEP3. CCDC deposition number: 249088.

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REFERENCES

1. McMahon CN, Francis JA, Bott SG, Barron AR. *J. Chem. Soc. Dalton Trans.* 1999; 67.
2. Dümichen U, Gelbrich T, Sieler J. *Z. Anorg. Allg. Chem.* 1999; **625**: 262.
3. Tang CY, Coxall RA, Downs AJ, Greene TM, Parsons S. *J. Chem. Soc. Dalton Trans.* 2001; 2141.