

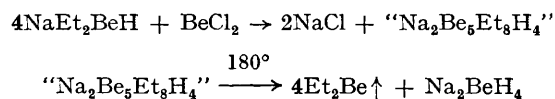
## Sodium Beryllium Hydride

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THE disproportionation of ethylberyllium hydride, brought about by pyrolysis under reduced pressure in the presence of sodium diethylberyllium hydride, has already been mentioned.<sup>1</sup> We now find that such pyrolysis of a mixture, in which the ratio of sodium to hydridic hydrogen is 1 : 2, results in the

evaporation of diethylberyllium leaving a colourless involatile residue of sodium beryllium hydride.



<sup>1</sup> N. A. Bell and G. E. Coates, *J. Chem. Soc.*, 1965, 692.

We do not wish to imply that " $\text{Na}_2\text{Be}_3\text{Et}_3\text{H}_4$ " is an individual chemical species; the formula only represents the overall composition of the material in ether solution after separation of sodium chloride.

Unlike beryllium hydride, prepared by described methods, either from di-*t*-butylberyllium<sup>2</sup> or from beryllium borohydride,<sup>3</sup> which is amorphous by *X*-ray diffraction, sodium beryllium hydride gives a very clear *X*-ray powder pattern which contains none of the lines characteristic of sodium hydride. Sodium beryllium hydride is insoluble in benzene, diethyl ether, tetrahydrofuran, or 1,2-dimethoxyethane. It is thermally more stable than beryllium hydride, does not melt below 360°, and decomposes between 380° and 400° under reduced pressure with evolution of hydrogen and sodium vapour.

We prefer to regard sodium beryllium hydride as an electron-deficient polymer with strongly polarized metal-hydrogen bonds, rather than as a salt  $\text{Na}_2[\text{BeH}_4]$  analogous to  $\text{NaBH}_4$ . We take this view partly on account of the  $\cdots \text{Be}_2\text{HNa}_2\text{HBe}_2 \cdots$  chains, in which each hydrogen is surrounded in a distorted tetrahedral arrangement by two beryllium and two sodium atoms, which occur in the structure of the diethyl ether complex of sodium diethylberyllium hydride.<sup>4</sup> Similar structural elements, in which the positions of sodium and beryllium atoms with respect to bridging hydrogen are rather similar, could well occur in sodium beryllium hydride.

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<sup>2</sup> G. E. Coates and F. Glockling, *J. Chem. Soc.*, 1954, 1526; E. L. Head, C. E. Holley, and S. W. Rabideau, *J. Amer. Chem. Soc.*, 1957, 79, 3687.

<sup>3</sup> L. Banford and G. E. Coates, *J. Chem. Soc.*, 1964, 5591.

<sup>4</sup> G. W. Adamson and H. M. M. Shearer, *Chem. Comm.*, 1965, 240.