

Department of Chemistry, The University, Manchester M13 9PL, U.K.

Figure 1. Crystal structure of *N*¹,*N*¹-dimethyl-*N*²-methylthio-benzamidine (**2a**).

sulphenamidine, like its precursor,¹ can be used as a sulphenylating agent.

All the above compounds give satisfactory elemental analyses. These sulphenamidines are, apparently, the first to be reported, and so we determined the crystal structure of compound (**2a**).† The X-ray diffraction data, collected at 178 K, yielded the structure shown in Figure 1. Although a detailed description will be published later, comparison with the structure of the parent triazene (**1a**)² shows that the backbone R³-S-N=C-N remains a (nearly) planar zig-zag chain, but the amino-group is no longer planar.

† Crystal data: C₁₀H₁₄N₂S, *M* = 194.3, orthorhombic, *a* = 5.894(4), *b* = 8.227(4), *c* = 21.067(6) Å, *U* = 1021.5 Å³, *D*_c = 1.26, *Z* = 4, *F*(000) = 416, Mo-*K*_α radiation, λ = 0.71069 Å, μ(Mo-*K*_α) = 3.0 cm⁻¹, space group *P*2₁2₁2₁ (No. 19), 1457 reflexions with *F* > 3σ(*F*), *R* = 3.9%.

The atomic co-ordinates for this work are available on request from the Director of the Cambridge Crystallographic Data Centre, University Chemical Laboratory, Lensfield Road, Cambridge CB2 1EW. Any request should be accompanied by the full literature citation for this communication.

Under analogous conditions, the aliphatic triazene (**1**; R¹ = R² = Me, R³ = Et) likewise gave nitrogen evolution, but the solution darkened owing to the formation of a copper complex, which was then decomposed with aqueous ethylenediamine solution. The organic layer gave no sulphenamidine, but diethyl disulphide was isolated in fair yield. This may indicate that the mechanism involves free radicals which form a tight pair in the case of the aryl triazenes, but which dimerise with the aliphatic precursor. A copper derivative, acting in a redox system, may take part.

We are grateful to Professor J. K. Sutherland and to Dr. T. L. Gilchrist for useful discussions, and to the University of Manchester for facilities.

Received, 10th January 1983; Com. 048

References

- 1 S. I. Mathew and F. Stansfield, *J. Chem. Soc., Perkin Trans. 1*, 1974, 540.
- 2 R. L. Beddoes and O. S. Mills, *J. Chem. Res.*, 1981, (S) 132, (M) 1701; G. L'abbé, A. Willcox, J.-P. Declercq, G. Germain, and M. Van Meerssche, *Bull. Soc. Chim. Belg.*, 1979, **88**, 107.