

Studies on Nitroaromatic Compounds. Part VI.¹ Synthesis of Polynitro-1,5- and -1,8-dimethylnaphthalenes

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The nitration of 1,5- and 1,8-dimethyl-4-nitronaphthalene has been studied in different media and a number of new polynitro-1,5- and -1,8-dimethylnaphthalenes have been prepared.

MANY of the explosives used in space research are required to be thermally stable and of low volatility since they may have to be sterilised by thermal means prior to transportation in spacecraft² and may be subjected to high temperature and low pressure under conditions of use.³ 2,2',4,4',6,6'-Hexanitrostilbene has found wide application as an explosive for use in space^{2,3} and is prepared for such purpose by treatment of 2,4,6-trinitrotoluene with base.⁴ Since polynitro-1,5- and -1,8-di-

methylnaphthalenes are structurally similar to polynitrotoluenes, they are of interest as possible intermediates in the preparation of thermally stable explosives of low volatility. The nitration of 1,5- and 1,8-dimethylnaphthalene has been relatively little studied, and only mononitro-derivatives have been reported to date.⁵ In view of this, we have investigated the nitration of 1,5- and 1,8-dimethyl-4-nitronaphthalene [(I) and (VI)] in relation to the preparation of polynitro-derivatives. The conditions used for the nitrations are shown in

¹ Part V, B. C. Webb, C. H. J. Wells, and J. A. Wilson, *J.C.S. Perkin II*, 1973, 156.

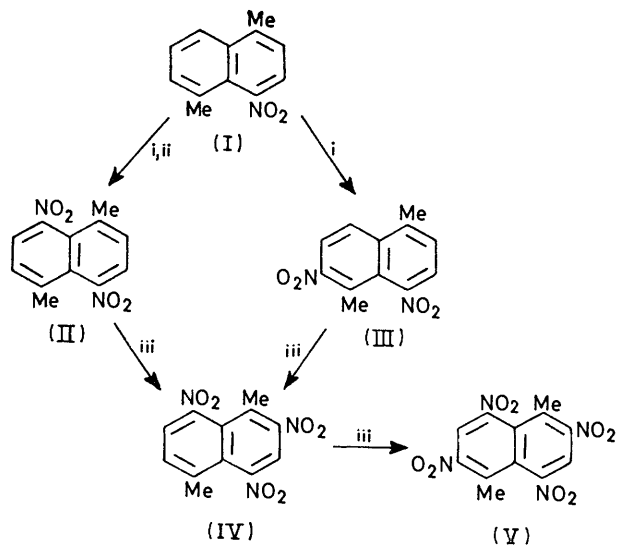
² N. J. Bowman and E. F. Knippenberg, *J. Spacecraft*, 1966, **3**, 1542.

³ E. E. Kilmer, *J. Spacecraft*, 1968, **5**, 1216.

⁴ K. G. Shipp and L. A. Kaplan, *J. Org. Chem.*, 1966, **31**, 857.

⁵ A. Davies and K. D. Warren, *J. Chem. Soc. (B)*, 1969, 873.

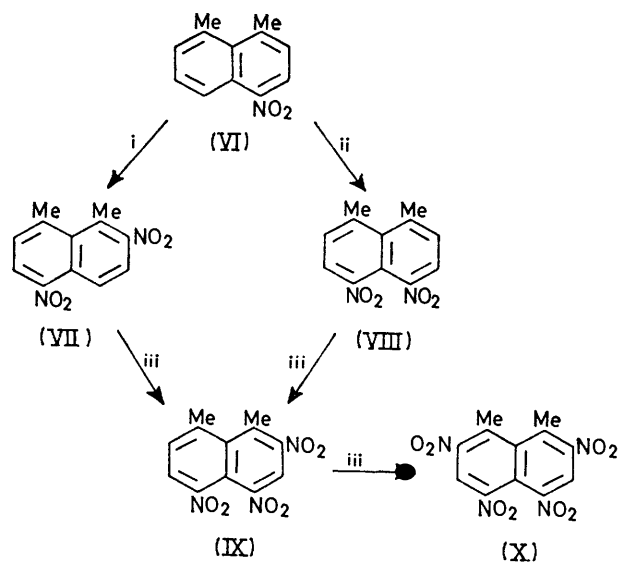
Schemes 1 and 2, as are the new compounds (II)—(V) and (VII)—(X) which have been synthesised.



SCHEME 1 Reagents: i, $\text{HNO}_3\text{-Ac}_2\text{O}$; ii, fuming $\text{HNO}_3\text{-(CH}_2\text{Cl)}_2$; iii, $\text{HNO}_3\text{-H}_2\text{SO}_4$

EXPERIMENTAL

Details are available as Supplementary Publication No. SUP 21104 (6 pp.).*



SCHEME 2 Reagents as Scheme 1

We thank the Ministry of Defence for financial support and for a maintenance grant (to B. C. W.).

[4/526 Received, 18th March, 1974]

* For details of Supplementary Publications see Notice to Authors No. 7 in *J.C.S. Perkin I*, 1973, Index issue.