

An Aryl Stevens Migration

By W. E. TRUCE and D. L. HEURING

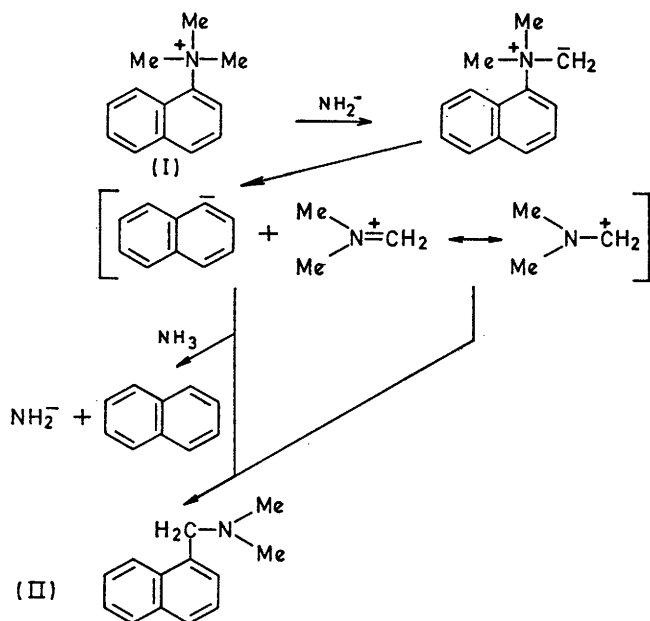
(Department of Chemistry, Purdue University, West Lafayette, Indiana 47907)

Summary A Stevens rearrangement in which the migrating group is α -naphthyl has been observed in high yield.

THE recent communication¹ of a Stevens rearrangement with aryl migration prompts us to report our findings in this area. Aryl migration occurs in high yield when the migrating aryl

grouping is α -naphthyl, *i.e.*, treatment of α -naphthyltrimethylammonium iodide (I) with two equivalents of sodium amide in liquid ammonia under reflux, yields quantitatively a mixture of 76% α -naphthylmethyldimethylamine (II), 23% naphthalene, and 1% or less of the dealkylation product, *NN*-dimethyl- α -naphthylamine (III).

The fact that naphthalene is observed in conjunction with rearrangement product is consistent with the following ion-pair mechanism:²



However, a radical-pair mechanism³ would also account for these products.

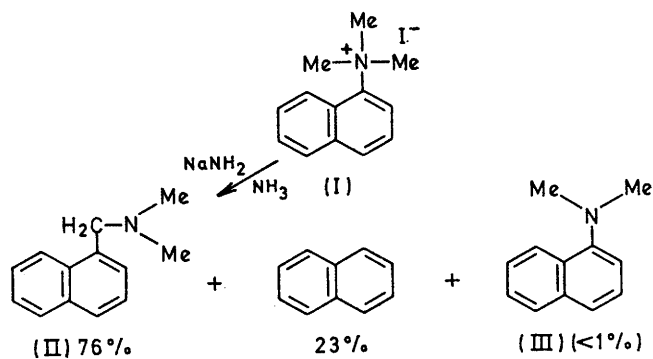
¹ H. Heaney and T. J. Ward, *Chem. Comm.*, 1969, 810.

² S. W. Kantor and C. R. Hauser, *J. Amer. Chem. Soc.*, 1951, **73**, 4122.

³ U. Schöllkopf, U. Ludwig, G. Ostermann, and M. Patsch, *Tetrahedron Letters*, 1969, **39**, 3415.

⁴ E. N. Yurigina, P. P. Alikhanov, E. A. Izrailevich, P. N. Manochkina, and A. I. Shatenstein, *Zhur. fiz. Khim.*, 1960, **34**, 587; A. I. Shatenstein, *Adv. Phys. Org. Chem.*, 1963, **1**, 182.

When β -naphthyltrimethylammonium iodide was subjected to the rearrangement conditions, the major product was β -naphthylamine, apparently resulting from NH_3 addition to naphthyne. No rearranged product could be



detected by n.m.r. as shown by the total absence of signals in the vicinity of δ 2.1. A trace of the dealkylation product NN -dimethyl- β -naphthylamine could be detected by n.m.r. The α -hydrogen of naphthalene is more acidic than the β -hydrogen,⁴ possibly accounting in part for naphthyne formation being dominant with the β -quaternary salt.

We thank the National Science Foundation for financial support.

(Received, October 27th, 1969; Com. 1618.)