Some Reactions of Phenylazirine

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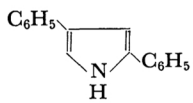
Recently, Smolinsky and Feuer[1] reported interesting findings concerning the reaction of phenylazirine (I) with amines. We would like now to report on some reactions of phenylazirine (I) with anionoid and cationoid reagents.

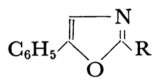
We have found that phenylazirine reacts with acetophenone in the presence of methylsulfinyl carbanion to afford 2, 4-diphenylpyrrole (II), mp 178—179°C.[2] (Found: C, 87.28; H, 6.09; N, 6.63%) 5-Nitroso deriv. (picrate),[2] mp 188—189°C (dec.).

The reaction of I and ethyl benzoyl acetate under essentially the same conditions gave 3-benzoyl-4-phenylpyrrolidone, mp 188—189°C. Found: C, 75.97; H, 5.22; N, 5.25%. Calcd for $C_{16}H_{15}NO_2$: C, 76.47; H, 5.22; N, 5.57%.

It was found that phenylazirine reacted with acid chlorides and anhydrides in the presence of triethylamine to afford the corresponding 2, 5-disubstituted oxazole derivatives (III). They were identified by a comparison of their properties with those of authentic samples. The experimental results are summarized in Table 1.

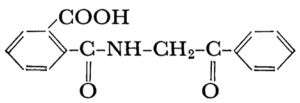


II

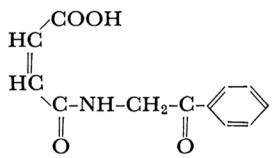


III

The reaction with phthalic and maleic anhydrides, however, proceeded through a different route to give compounds IV and V, with melting points of 163—164°C and 161—162°C respectively. IV; Found: C, 67.80; H, 4.61; N, 4.97%. Calcd for $C_{16}H_{13}NO_4$: C, 67.84; H, 4.63; N, 4.95%. V; Found: C, 60.99; H, 4.72; N, 5.88%. Calcd for $C_{12}H_{11}O_4N$: C, 61.80; H, 4.75; N, 6.01%. Their compositions as well as their infrared spectra (3290, 3060, 1720 and 1690 cm^{-1}) suggest their structures to be IV and V respectively.



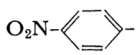
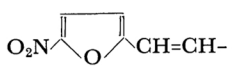
IV



V

Compound IV was converted with diazomethane into *N*-phenacylphthalimide, which was identified by comparison with an authentic specimen.[6]

TABLE I

R	Mp, °C	Formula	Anal. (Found), %		
			C	H	N
CH_3	55—57[3]				
	155—156 (picrate)	$C_{16}H_{12}O_8N_4$	49.55	5.13	14.56
C_6H_5	71—72[4]	$C_{15}H_{11}ON$	81.41	5.13	6.42
	172—173 (picrate)	$C_{21}H_{14}O_8N_4$	56.33	2.99	12.43
	206—207[5]	$C_{15}H_{10}O_3N_2$	67.82	3.76	10.80
	199—201 (dec.)	$C_{15}H_{10}O_4N_2$	63.62	3.62	10.25

1) G. Smolinsky and B. I. Feuer, *J. Org. Chem.*, **31**, 1413 (1966).
2) M. A. Rogers, *J. Chem. Soc.*, **1943**, 590.
3) S. Gabriel, *Ber.*, **43**, 1284 (1910).
4) E. Fischer, *ibid.*, **29**, 207 (1896).
5) J. Lister and R. Robinson, *J. Chem. Soc.*, **1912**, 1312.
6) S. Gabriel, *Ber.*, **41**, 1132 (1908).