

1,3-DIPHENYLQUINOXALINO [2,3-C] FURAN: A STABLE REACTIVE DIENE

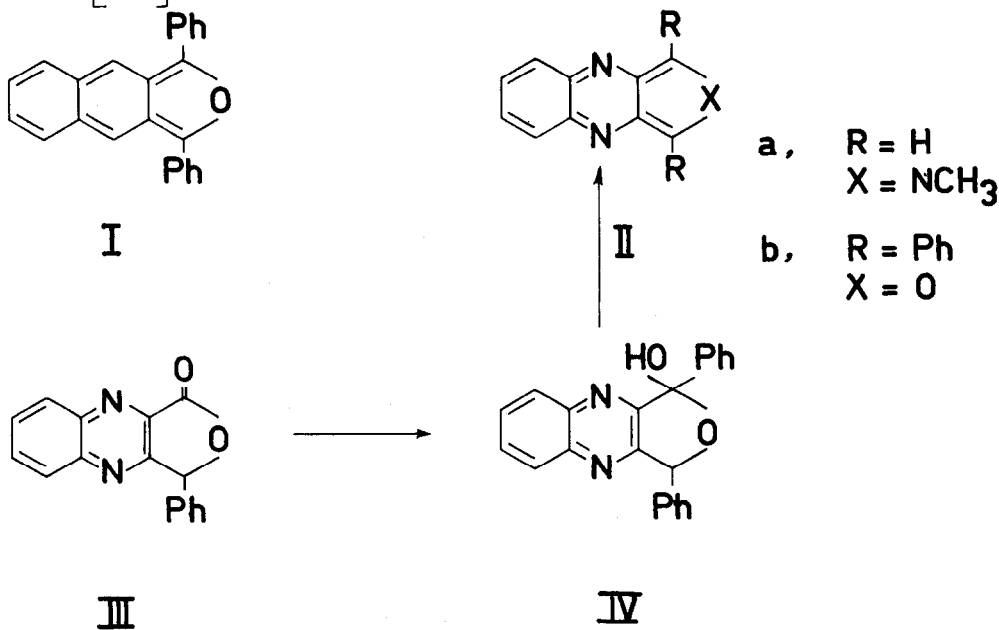
Makhluf J. Haddadin, Andre Yavrouian, and Costas H. Issidorides

Department of Chemistry, American University of Beirut,

Beirut, Lebanon

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The recent reports of Cava and Van Meter<sup>1</sup> on the synthesis and reactions of 1,3-diphenyl-naphtho [2,3-C] furan (I), and of Anderson and Fleming<sup>2</sup> on the preparation of pyrro [3,4-b] quinoxaline (IIa), prompt us to report the synthesis of a related analog - 1,3-diphenylquinoxalino [2,3-C] furan (IIb).



Treatment of lactone III<sup>3</sup> with phenyl magnesium bromide yielded lactol IV which, upon heating in acetic acid at reflux temperature, gave 1,3-diphenylquinoxalino [2,3-C]furan (IIb) in 20% yield. The product precipitated from the hot acetic acid solution as a green crystalline solid melting at 244-246°. Furan IIb is almost insoluble in most organic solvents at room temperature but dissolves readily when heated in moderately high boiling solvents (dimethoxyethane, dimethylformamide, and dimethylsulfoxide), with no immediate precipitation on cooling.

The deep blue solution of IIb in dimethylsulfoxide is instantaneously decolorized at room temperature by addition of the dienophiles listed in Table I. The resulting adducts, when heated to or above their melting points, decompose giving a blue color presumably due to reversal of the Diels-Alder reaction.

Table I

Dienophile	M.P. of Adduct	Strong IR bands of Adduct (cm <sup>-1</sup> )
Maleic Anhydride	105-107	1790, 1660, 1230, 1080, 1000, 940, 770, 745, 700.
Maleimide	138-141	1730, 1660, 1185, 1000, 940, 870, 765, 740, 700.
N-Phenylmaleimide	117-121	1720, 1185, 1000, 770, 700.
Dimethylacetylene di carboxylate	198-202	1720, 1630, 1320, 1265, 1125, 1010, 960, 770, 740, 700.
1,4-Naphthoquinone	186-192	1680, 1590, 1290, 1240, 1000, 760, 740, 700.

Although extremely reactive in solution, 1,3-diphenylquinoxalino [2,3-C] furan is a recrystallizable and quite stable solid, unlike its naphtho analog (I)<sup>1</sup>, which cannot be recrystallized and decomposes slowly even in the solid state.

Further work on the reactions of IIb will be reported later.

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#### References

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2. R.C. Anderson and R.H. Fleming, Tetrahedron Letters, 1581 (1969).
3. M.J. Haddadin and C.H. Issidorides, *ibid*, 4609 (1968).