Syntheses of 2-(2-Quinoxalyl)-1-phenylethanone and Related Ethanones

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Nine 2-(2-quinoxalyl)-1-phenylethanones were synthesized by the condensation of 2-methylquinoxaline and the requisite methyl benzoate ester with sodium hydride as the condensing agent. Substituents in the 3 or 4 positions of the phenyl ring were methyl, methoxy, chloro, or trifluoromethyl.

In connection with our interest in enolizable ketones (*1*) we recently had need of some 2-(2-quinoxalyl)-1-phenylethanones which carried substituents in the 3 or 4 position of the phenyl moiety, the substituent being methyl, methoxy, chloro, or trifluoromethyl. The parent compound has been prepared by Hayashi et al. (*2*) and Wolfe et al. (*3*). The method of Rauch et al. (4) was found to be a suitable procedure to produce the requisite ketones in adequate yield.

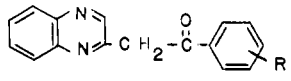
Table I lists the 2-(2-quinoxalyl)-1-phenylethanones prepared, as well as the melting points and yields.

Experimental Section

The 2-methylquinoxaline was obtained commercially as well as the substituted benzoic acids which were converted into the individual methyl esters by the method of Clinton and Laskowski (*5*). Elemental analyses were performed by Huffman Microanalytical Laboratories, Wheatridge, CO. Melting points were determined on a Thomas-Hoover melting point apparatus and were corrected. Yields represent single preparations and the yields increased as experience in the preparations was gained. The following example will illustrate the synthesis of the 2-(2-quinoxalyl)-1-phenylethanones.

For 2-(2-quinoxalyl)-1-(3-methylphenyl)ethanone, 75 mL of anhydrous toluene and 24.6 g (0.50 mol) of sodium hydride (50% oil dispersion) were placed in a stirred flask. There was added 14.4 g (0.10 mol) of 2-methylquinoxaline in 120 mL of anhydrous toluene, and the reaction mixture heated to 70 °C. A solution of 15.0 g (0.10 mol) of methyl *m*-methylbenzoate in 20 mL of anhydrous toluene was added dropwise while maintaining the temperature at approximately 70 °C. The reaction mixture was heated to reflux, refluxed overnight, and cooled in an ice bath.

Table I. 2-(2-Quinoxalyl)-1-phenylethanones[a]



R	% yield	mp, °C
H	29	156.5–157.5[b]
m-CH_3	42	133–134
p-CH_3	39	153–154.5
m-OCH_3	58	124.5–125.5
p-OCH_3	quant.	153–153.5
m-Cl	quant.	168–169
p-Cl	quant.	181–182
m-CF_3	50	127–129
p-CF_3	52	131–132

[a] Elemental analyses (C, H, and N) in agreement with theoretical values have been obtained and submitted for review. [b] Reported mp 155–156 °C (*2*), mp 152–153 °C (*3*).

Fifteen milliliters of acetic acid was cautiously added dropwise, followed by a similarly added 30 mL of a 50–50 acetic acid–water mixture. With caution initially, 150 mL of water was then added to the reaction mixture. At this point some of the 2-(2-quinoxalyl)-1-(3-methylphenyl)ethanone precipitated out of solution and was removed by filtration. The toluene layer was separated, dried, and rotary evaporated resulting in the formation of an additional quantity of product. A total quantity of 11.1 g (42% yield) of 2-(2-quinoxalyl)-1-(3-methylphenyl)ethanone was obtained, which after recrystallization from toluene had a melting point of 133–134 °C.

Literature Cited

(1) Wursthorn, K. R., Sund, E. H., *J. Heterocycl. Chem.*, **11**, 123 (1974).
(2) Hayashi, E., Miyageshima, T., *Yakugahu Zasshi*, **88**, 303 (1968); *Chem. Abstr.*, **69**, 59199 (1968).
(3) Wolfe, J. F., Portlock, D. E., Feuerback, D. J., *J. Org. Chem.*, **39**, 2006 (1974).
(4) Rauch, E. B., Dickinson, P., Welsh, J. A., U.S. Patent 3 375 258 (1968).
(5) Clinton, R. O., Laskowski, S. C., *J. Am. Chem. Soc.*, **70**, 3135 (1948).

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