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

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Seven 2-(2-benzoxazolyl)-1-phenylethanones were synthesized by the condensation of 2-methylbenzoxazole and the requisite methyl benzoate ester with sodium hydrate as the condensing agent. Substituents in the 3- or 4-positions of the phenyl ring were methyl, methoxy, and chloro.

Recently we had need of some 2-(2-benzoxazolyl)-1-phenylethanones which carried a substituent in the 3- or 4-positions of the phenyl moiety, the substituent being methyl, methoxy, or chloro. The parent compound has been prepared by several investigators, Stepanov and Davydowa,[1] Stachel,[2] Nardi, Tajana, and Pennini,[3] and Rauch, Dickinson, and Welch.[4] The latter method, Rauch et al., appeared to offer the most straightforward synthesis in highest yield.

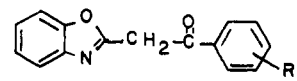
Table I lists the 2-(2-benzoxazolyl)-1-phenylethanones prepared, as well as the melting points and yields.

Experimental Section

The 2-methylbenzoxazole was obtained commercially as well as the substituted benzoic acids which were converted into their methyl ester 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-benzoxazolyl)-1-phenylethanones.

In the synthesis of 2-(2-benzoxazolyl)-1-(4-methylphenyl)-ethanone, 75 mL of anhydrous toluene and 26.6 g (0.50 mol) of sodium hydride (50% oil dispersion) were placed in a stirred flask. There was added 13.1 g (0.10 mol) of 2-methylbenzoxazole in 120 mL of anhydrous toluene and the reaction mixture heated to 70 °C. A solution of 16.4 g (0.10 mol) of ethyl *p*-methylbenzoate in 20 mL of anhydrous toluene was added dropwise while maintaining the temperature at approximately 70 °C. (The ethyl ester was used in this instance because of the low solubility of the methyl ester.) The reaction mixture was heated to reflux, refluxed overnight, and cooled in an ice bath and 15 mL of acetic acid was added, followed by 30 mL of a 50–50 acetic acid–water mixture cautiously added dropwise. To the reaction mixture, cautiously initially, 150 mL of water was added. At this point some of the 2-(2-benzoxazolyl)-1-(4-methylphenyl)ethanone precipitated out and was removed by filtration. The toluene layer was separated, dried, and rotary evaporated resulting in the formation of an additional quantity of product. There was obtained a total quantity of 21.2 g (84% yield) of 2-(2-benzoxazolyl)-1-(4-methylphenyl)-ethanone which, after recrystallization from 95% ethyl alcohol, had mp 97.5–8.5 °C.

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



R	% yield	mp, °C
H	36	93.5-94.5[b]
p-CH_3	84	97.5-98.5
m-CH_3	91	67-8
p-OCH_3	85	107.5-108.5
m-OCH_3	61	59.5-60
p-Cl	90	168.5-170
m-Cl	35	144-145

[a] Elemental analyses (C, H, and N) in agreement with theoretical values have been obtained and submitted for review. [b] Reported mp 88–8.5 °C,[1] mp 87–88 °C,[2] mp 97–98 °C,[3] and mp 90–91 °C.[4]

Literature Cited

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