Short Communication

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SYNTHESIS OF SOME ALKYL-2-NAPHTHYL ETHERS

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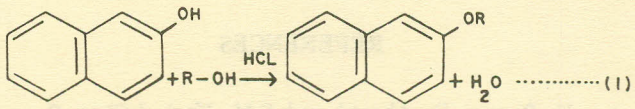
Alkyl-2-naphthyl ethers form an important and useful class of compounds. Some are used in perfume industry [1] others have been reported to be effective insecticides [2]. Their methods of preparation described in the literature require rather drastic conditions and involve cumbersome procedures [3-5]. We report here a new convenient method for synthesis of the alkyl-2-naphthyl ethers involving relatively mild conditions. The method consists of the reaction of 2-naphthol with an alcohol in the presence of aqueous hydrochloric acid as illustrated by equation (1)



..... (1)

R = Methyl, ethyl, *n*-propyl, isopropyl, *n*-butyl, *iso*-butyl, *n*-amyl, *iso*-amyl.

Using this method eight alkyl-2-naphthyl ethers were prepared. In general the method of preparation of the ethers was as follows. A mixture of 2-naphthol (7.2g.),

Table 1. Melting points of some alkyl-2-naphthyl ethers and their picrates.

Compound No.	Alkyl group	% Yield of ether	M.P. of ether C°[a]		M.P. of picrates C°[a]	
			Observed	Literature	Observed	Literature
1.	Methyl	65	72.0	72.5-73.0[b] 71.5[c]	114.5	116.5-117.0[b] 113.0-113.5[c]
2.	Ethyl	62	36.0	35.5-36.0[b] 37.0[c]	100	101.0-101.5[b] 99.0-100.5[c]
3.	n-Propyl	60	39.5	39.5-40.0[b] 39.5[c]	76	80.5-81.5[b] 76.0[c]
4.	Iso-propyl	55	40.0	40.0[b,d]	92.0	95.0-95.5[b] 91.5[c]
5.	n-Butyl	55	35.0	33.0-33.5[b] 35.5[c]	67.0	67.0-67.5[b] 67.0[c]
6.	Iso-Butyl	80	32.5	33.0-33.5[b] 33.0[c]	80.0	84.0-85.0[b] 80.5[c]
7.	B-Amyl	40	25.0	24.5[b] 25.0[c]	63.5	66.5-67.0[b] 64.0[c]
8.	Iso-Amyl	45	26.0	28.0-28.5[b] 26.0[c]	91.0	93.0-94.0[b] 90.5[c]

a. All observed melting points are uncorrected; b. Reference 7; c. Reference 3; d. Reference 8; e. Reference 9.

Table 2. NMR spectral data of some alkyl-2-naphthyle ethers.

Compound No.	Alkyl group	NMR data δ (CCl_4)
1.	Methyl	7.15-8.15 (7 H, m), 4.15 (3 H, s)
2.	Ethyl	7.00-8.00 (7 H, m), 41.5 (2 H, q), 1.60 (3 H, t).
3.	n-Propyl	7.10-8.10 (7 H, m), 4.25 (2 H, t), 2.16 (2 H, m), 1.35 (3 H, t).
4.	Iso-Propyl	7.10-8.10 (7 H, m), 4.35 (1 H, m), 1.75 (6 H, d).
5.	n-Butyl	7.15-8.15 (7 H, m), 4.12 (2 H, t), 2.00-2.30 (4 H, m) 1.35 (3 H, t).
6.	Iso-Butyl	7.15-8.15 (7 H, m), 4.12 (2 H, d) 2.40-2.60 (1 H, m), 1.50 (6 H, d).
7.	n-Amyl	7.00-8.00 (7 H, m), 4.10 (2 H, t), 1.40-2.20 (6 H, m), 1.25 (3 H, t).
8.	Iso-Amyl	7.00-8.00 (7 H,m), 4.10 (2 H, t) 2.30-2.60 (2 H, m), 1.90-2.10 (1 H, m) 1.50 (6 H, d).

the respective alcohol (40ml) and concentrated hydrochloric acid (15 ml, 10N) was heated under reflux for seven hours. The reaction mixture was then cooled, treated with excess of aqueous sodium hydroxide solution (12%, 80 ml) and heated for about fifteen minutes. Most of the ureacted alcohol was distilled off under reduced pressure. The reaction mixture was then allowed to stand overnight. On cooling, in most of the cases, the crude ether precipitated which was filtered off and recrystallised from 50% aqueous methanol. In case of *n*-butyl-2-naphthyl ether and *iso*-amyl-2-naphthyl ether, the ethers did not precipitate out and were extracted with diethyl ether (2 x 40 ml). After removal of the solvent, the ethers were re-crystallised from aqueous methanol. The picrate derivative of each of the ether was also prepared. The melting points of ethers and their picrates given in Table 1.

In the IR spectrum of each ether the characteristic strong C–O–C streching[6] peaks at 1255 and 1040 cm^{-1} were observed. In addition, the NMR spectra of all the ethers were recorded and reported in Table 2.

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