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Some Esters of 2-Furanacetic Acid

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Until recently the synthesis of 2-furanacetic acid has been accomplished only with considerable difficulty. It has been shown,¹ however, that it may be obtained from furfural in quite good yield by the rhodanine method. Probably because of its former inaccessibility very few of its functional derivatives are known. The anilide² has been

Experimental⁴

The esters were all prepared by refluxing 5-g. samples of the acid with twenty equivalents of the alcohol in the presence of 3.5 g. of concd. sulfuric acid. The reaction products were worked up in the usual manner. Table I gives the physical data.

TABLE I

Ester	Yield, %	B. p., °C.	Press., mm.	n_D^{25}	d_4^{25}	MR_D	
						(Obsd.) ^a	(Calcd.) ^{b,c}
Methyl	74	87–88	21	1.4638	1.1250	34.31	34.689 (I)
Ethyl	80	88	15	1.4571	1.0763	38.88	39.307 (II)
Propyl	75	115–116	34	1.4558	1.0436	43.75	43.925 (III)
Isopropyl	62	92–93	17	1.4511	1.0338	43.76	43.925 (IV)
<i>n</i> -Butyl	65	110–111	13	1.4558	1.0232	48.33	48.543 (V)
Isobutyl	62	112–113	21	1.4518	1.0168	48.27	48.543 (VI)

^a By use of the Lorenz-Lorentz equation. ^b From the revised values of Eisenlohr (Landolt-Börnstein, "Physikalische-chemische Tabellen," 5th ed., Vol. II, 1923, p. 985). ^c Hughes and Johnson, *THIS JOURNAL*, **53**, 737 (1931), have shown that for furan derivatives having no external double bond conjugated with the ring, the value MR_D obsd. – MR_D calcd. is minus and averages (for twelve compounds) –0.479.

used as a solid derivative, an intermediate in its preparation being the acid chloride.² The methyl ester³ has been previously prepared also.

We have taken advantage of the necessity for preparing the ethyl ester to extend the series to the other esters derived from some of the low molecular weight aliphatic alcohols. The ethyl ester has been found to be capable of reduction by the method of Bouveault and Blanc to 2- α -furylethanol, more about which we hope shortly to report.

The present paper records the preparation and physical properties of some esters of 2-furanacetic acid. These compounds are mobile colorless liquids of pleasant odor. On standing they slowly develop a light straw color.

(1) Plucker and Amstutz, *THIS JOURNAL*, **62**, 1512 (1940).

(2) T. Reichstein, *Ber.*, **63B**, 749 (1930).

(3) Reichstein and Morsman, *Helv. Chim. Acta*, **17**, 1119 (1934).

TABLE II

ANALYSES

	Carbon, %		Hydrogen, %	
	Calcd.	Found	Calcd.	Found
I	59.9	59.7	5.75	6.35
II	62.3	62.2	6.54	6.78
III	64.2	63.7	7.20	7.58
IV	64.2	63.7	7.20	7.38
V	65.9	65.8	7.74	7.74
VI	65.9	65.9	7.74	7.91

Summary

Several esters of 2-furanacetic acid and the lower aliphatic alcohols have been prepared and some of their physical constants determined.

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