NOTES

Derivatives of Furfuryl and Tetrahydrofurfuryl Alcohols

By Richard D. Kleene and Sherman Fried

As an aid in the identification of furfuryl and tetrahydrofurfuryl alcohols, the following esters have been prepared following the method of Shriner and Fuson.[1] They were obtained as colorless crystals by recrystallization from ethanol. The original alcohols were furnished through the courtesy of the Quaker Oats Company, Chicago.

Furfuryl *p*-Nitrobenzoate.—Needles, m. p. 75–77°. *Anal.* Calcd. for $C_{12}H_9O_5N$: N, 5.67. Found: N, 6.16.

Tetrahydrofurfuryl *p*-Nitrobenzoate.—Glistening white leaflets, m. p. 46–48°. *Anal.* Calcd. for $C_{12}H_{13}O_5N$: N, 5.58. Found: N, 5.70.

Tetrahydrofurfuryl 3,5-Dinitrobenzoate.—Small needles, m. p., 83–84°. *Anal.* Calcd. for $C_{12}H_{12}O_7N_2$: N, 9.46. Found: N, 9.52.

The analyses were performed by Dr. T. S. Ma.

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[1] Shriner and Fuson, "Identification of Organic Compounds," John Wiley and Son, New York, N. Y., 1935, p. 142.

Department of Chemistry
University of Chicago
Chicago, Illinois
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The Decrease in Resistance of Constantan with a Magnetic Field at Temperatures between 1 and 20°K.

By W. F. Giauque and J. W. Stout

In various magnetic experiments at the temperatures of liquid hydrogen and helium we have employed a coil of no. 40 Constantan wire ("advance" wire, Driver Harris Co., Harrison, N. J.) as a heater to evaporate liquid helium so that liquid hydrogen could be added for work at the higher temperatures. It seemed worth while to take the opportunity to measure the effect of a magnetic field on the resistance of Constantan, especially since the resistance decreases with magnetic field strength. This effect has been measured down to 90°K. by Obata.[1] The observations, which were made with a current of 2.5×10^{-4} ampere, are given in Table I. Although the coil was not placed carefully with respect to field direction, the current was approximately at right angles to the field.

Table I

Decrease in the Resistance of Constantan in a Magnetic Field

		$(\Delta R/R) \times 10^3$, H in gauss				
T, °K.	R(H = 0) ohms	H = 850	H = 1600	H = 3000	H = 4100	H = 8300
1.47	220.804	−0.72	−1.61	−2.77	−3.47	−5.38
4.22	221.441	− .66	−1.55	−2.78	−3.54	−5.63
10.67	223.412	− .87	−1.88	−3.33	−4.28	−7.05
20.34	226.613	−1.59	−2.94	−4.84	−6.02	−9.51

At the temperatures of this investigation the change of resistance is proportional to somewhat more than the first power of the field strength at the lower fields and decreases to considerably less than the first power at the higher fields. Some very rough observations near the temperature of liquid air indicated a proportionality to the square of the field strength, as was the case in the observations of Obata.

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[1] Obata, "I. C. T.," Vol. VI, p. 422.

Chemical Laboratory
University of California
Berkeley, Calif.
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Polarographic Determination of Certain Natural Products

By E. B. Hershberg, John K. Wolfe and Louis F. Fieser

In a recent report[1] a method was described for the quantitative determination of ketosteroids, consisting in condensation with excess Girard's reagent and polarographic analysis of a suitably buffered aqueous solution of the reaction mixture. The method is well adapted to the determination of the 17-ketosteroids in urinary extracts, for among the saturated compounds those having a single carbonyl group at C_3 are indifferent and those with a lone ketonic group at C_{20} give a somewhat different polarographic response. Δ^4-3-Ketosteroids are determinable by the same method and are distinguishable from the 17-keto compounds because discharge occurs at a significantly lower potential.

We have now found that the method can be extended to the determination of non-ketonic alcohols of the sterol group by oxidation of these substances to the corresponding ketones with aluminum *t*-butoxide according to Oppenauer.[2] Thus 100 mg. of dehydroisoandrosterone was

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[1] Wolfe, Hershberg and Fieser, *J. Biol. Chem.*, in press.

[2] Oppenauer, *Rec. trav. chim.*, **56**, 137 (1937).