p-Phenylphenacyl α-methyl-γ-phenylbutyrate, m. p. 62–63°. *Anal.* Calcd. for $C_{25}H_{24}O_3$: C, 80.65; H, 6.45. Found: C, 80.74; H, 6.56.

p-Phenylphenacyl β-methyl-δ-phenylvalerate, m. p. 66–67°. *Anal.* Calcd. for $C_{26}H_{26}O_3$: C, 80.83; H, 6.73. Found: C, 80.76; H, 6.79.

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HERBERT E. CARTER

RECEIVED MAY 18, 1940

6-METHYL-5-NITRO-2-NAPHTHOIC ACID

Five grams of 1-nitro-2,6-dimethylnaphthalene[1] (m. p. 67–68°) was refluxed for two days in 50 cc. of water with 45 cc. of nitric acid added in portions. The crude product (5 g.) was collected by filtration and extracted with sodium bicarbonate to give 2 g. of 6-methyl-5-nitro-2-naphthoic acid; the neutral residue was a mixture of dinitrodimethylnaphthalenes. On recrystallization from 95% acetic acid, the acid formed rosets of colorless needles, m. p. 258–259°, neutral equivalent 230 (calcd. 231).

Anal. Calcd. for $C_{12}H_9O_4N$: C, 62.31; H, 3.94. Found: C, 62.61; H, 4.08.

The isomeric 6-methyl-1-nitro-2-naphthoic acid was prepared according to Meyer and Alken[1] in 3% yield, m. p. 238–239°.

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[1] Meyer and Alken, *Ber.*, **55**, 2280 (1922).

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URBANA, ILLINOIS
CHARLES C. PRICE

RECEIVED JUNE 27, 1940

DERIVATIVES OF METHACROLEIN

The sample of methacrolein used for the preparation of the derivatives had the following physical constants: b. p. 73.5°; $n^{20}{}_D$ 1.4191; $d^{20}{}_4$ 0.830; M_D calcd., 21.37; M_D found, 21.31. The usual methods were used for the preparation of the derivatives.[1]

Semicarbazone of Methacrolein.—Colorless plates from 25% ethanol, m. p. 197.5–198°.

Anal. Calcd. for $C_5H_9ON_3$: N, 33.06. Found: N, 33.09.

p-Nitrophenylhydrazone of Methacrolein.—Orange crystals from xylene, m. p. 161–163°.

Anal. Calcd. for $C_{10}H_{11}O_2N_3$: N, 20.48. Found: N, 19.99.

2,4-Dinitrophenylhydrazone of Methacrolein.—Orange crystals from xylene, m. p. 206–206.5°

Anal. Calcd. for $C_{10}H_{10}O_4N_4$: N, 22.30. Found: N, 22.05.

1-Phenyl-4-methyl-Δ^2-pyrazoline.—Phenylhydrazine reacted with methacrolein to produce the pyrazoline and not the phenylhydrazone. It was recrystallized from petroleum ether, m. p. 73–74°.

Anal. Calcd. for $C_{10}H_{12}N_2$: N, 17.49. Found: N, 17.24.

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[1] Shriner and Fuson, "Systematic Identification of Organic Compounds," 2nd Edition, John Wiley and Sons, N. Y., 1940.

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UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS
R. L. SHRINER
A. G. SHARP

RECEIVED JUNE 28, 1940

COMMUNICATIONS TO THE EDITOR

CONVERSION OF CANNABIDIOL TO A PRODUCT WITH MARIHUANA ACTIVITY. A TYPE REACTION FOR SYNTHESIS OF ANALOGOUS SUBSTANCES. CONVERSION OF CANNABIDIOL TO CANNABINOL

Sir:

Cannabidiol, which has been shown in previous papers to have structure I with doubt merely as to the position of the double bond in the left-hand ring, isomerizes in the presence of pyridine hydrochloride, ethanolic hydrogen chloride, hydrogen chloride in ether, sulfamic acid, ethanolic phosphoric acid or zinc chloride to give tetrahydrocannabinol (II). Undoubtedly other reagents of a similar character will be found to be equally effective for the isomerization. The tetrahydrocannabinol (II) is a colorless highly viscous oil (b. p. 188–190° (2.5 mm.), found: C, 79.90; H, 9.52). It has a constant boiling point regardless of the method of synthesis, but its rotation varies depending on the conditions used; under specified conditions two products of constant rotation are produced, $[\alpha]^{27}{}_D$ $-160°$ and $[\alpha]^{32}{}_D$ $-240°$. Apparently the reagents sometimes cause a shift in the double bond or an interchange of diastereoisomers. The structure of compound II was demonstrated by dehydrogenation to cannabinol (m. p. 75–76.5°) (III) which has been proved by synthesis to have that formula,