TABLE I

MELTING POINT AND NITROGEN VALUES

	$(COCl)_2$ plus crude α-methylnaphthalene A	$(COCl)_2$ plus indole B	M. p. of 90% A and 10% B	Oddo, etc.	Giua
Acid chloride	132d	135–136d	133d		138–139
Acid	214d	215d	213d	215d	224–225d
Amide	249–251	251–252	249–252	248	
Ethyl ester	184–185			186	
Acid chloride, N %	6.88			6.74 calcd,	
Amide, N %	14.78			14.89 calcd.	
Ester, N %	6.49			6.45 calcd.	
Acid, N %	7.10			7.41 calcd.	
Amide, C %	64.33			63.83 calcd.	
Amide, H %	4.47			4.26 calcd.	

compounds were prepared by Oddo and Albanese[2] and Majima and Shigematsu.[3] These authors had prepared the ethyl ester of 3-indole-glyoxalic acid by treatment of ethyl oxalyl chloride with the magnesium derivative of indole. Note, however, that Giua[4] claims that indole dissolved in absolute ether reacts with oxalyl chloride to give 2-indole-glyoxalyl chloride.

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[2] Oddo and Albanese, *Gazz. chim. ital.*, **57**, 827 (1927).

[3] Majima and Shigematsu, *Ber.*, **57B**, 1449 (1924).

[4] Giua, *Gazz. chim. ital.*, **54**, 593 (1924).

JONES CHEMICAL LABORATORY
THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS

RECEIVED JUNE 10, 1940

4-Phenylcyclohexene

BY CHARLES C. PRICE AND JOSEPH V. KARABINOS

Since the 3-phenylcyclohexene formed from the dehydration of *trans*-2-phenylcyclohexanol[1] gave no satisfactory degradation products with permanganate or ozone, while dilute nitric acid oxidation gave β-phenyladipic acid, it seemed desirable to ascertain whether it was indeed the 3-isomer by comparison with a sample of the 4-isomer, which might have been formed by a shift in the double bond. The latter compound has already been prepared from styrene and butadiene[2] but its physical properties were not reported.

We have, therefore, repeated this preparation, obtaining 4-phenylcyclohexene in a yield of 8%. (*Anal.* Calcd. for $C_{12}H_{14}$: C, 91.08; H, 8.92. Found: C, 91.32; H, 9.16.) Its physical properties, b. p. (16 mm.) 88–90°, n^{20}_D 1.5420, d^{20}_4 0.9715, differ markedly from those of the 3-isomer.

To confirm its structure, 2.6 g. of the hydrocarbon was oxidized with 5.5 g. of potassium permanganate in 50 cc. of water for twenty-four hours. Filtration, acidification and cooling gave crystals of β-phenyladipic acid, m. p. 147–148°. The neutral equivalent was 114, in agreement with the calculated value of 111.

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[1] Price and Karabinos, THIS JOURNAL, **62**, 1159 (1940).

[2] Alder and Rickert, *Ber.*, **71**, 379 (1938).

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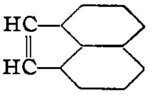
RECEIVED MAY 23, 1940

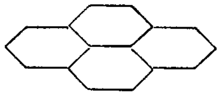
The Isolation and Identification of Fluoranthene from Carbon Black

BY JOHN REHNER, JR.

When carbon black is produced by the thermatomic[1] process a waxy material is observed to deposit from the hydrogen stream during the cracking of the natural gas. It has been shown[2] that this wax consists partly of acenaphthylene and pyrene.

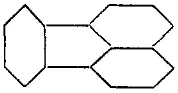


Acenaphthylene



Pyrene

We were interested in this Laboratory in determining whether compounds of similar polycyclic structure exist in the hydrocarbon-soluble fraction of carbon produced by the above process. A 5-kg. sample of thermatomic carbon (of the commercial brand known as "P-33") was saturated overnight at room temperature with 20 liters of benzene and the extract filtered and evaporated to dryness, 14 g. of residue being obtained. This was distilled in the temperature range of 150–230° at 4 mm. pressure and yielded 3.5 g. of orange-colored crystals. These were recrystallized three times from hexane and were identified as fluoranthene by the following analysis: C, 95.08, 95.13; H, 5.02, 5.05 observed; C, 94.97; H, 5.03 calcd.; molecular weight 179 (in benzene), 198 (in 1,4-dioxane); 202, calcd. The hydrocarbon was further purified by con-



Fluoranthene

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[1] Moore, *Ind. Eng. Chem.*, **24**, 21 (1932).

[2] Campbell, Cromwell, and Hager, THIS JOURNAL, **58**, 1051 (1936).