

FARADAY'S
ENCYCLOPEDIA
OF
HYDROCARBON COMPOUNDS
 $C_{12}H_{18-26}$

Compiled by
Dr. JOSEPH ESCOTT FARADAY

The Information in this volume covers the Literature up to 1 January 1955 and comprises:

The ORIGINAL VOLUME up to 1 January 1951

The FIRST REPLACEMENT-ADDITION ISSUE for $C_{12}H_{18-26}$ up to 1 January 1955

VOLUME 11

CHEMINDEX LIMITED
76 CROSS STREET
MANCHESTER 2, ENGLAND

THE PURPOSE OF FARADAY'S ENCYCLOPEDIA OF HYDROCARBON COMPOUNDS

To survey the chemical literature for all available published information on an organic compound comprehensively it is necessary to consult Beilstein's Handbuch der Organischen Chemie and the three abstract journals, namely Chemical Abstracts, British Abstracts and Chemisches Zentralblatt. Although each abstract journal aims at complete coverage of the literature, information appears in one that does not appear in the other two and therefore to use anything less than all three may lead to the omission of some vital information.

The survey involves a search through some thirty to forty different indexes—the number varying from time to time on publication of new or cumulative indexes—and then except for Beilstein turning to text pages of the abstract journals themselves for original references. The work involved varies from compound to compound depending on the information sought; a general opinion is that an exhaustive survey may easily mean a week's search of the literature.

The purpose of this ENCYCLOPEDIA is to reduce tedious labour in the case of hydrocarbons. Under each compound is gathered the material in or a reference to Beilstein and the material in the three abstract journals relating to the most useful features, namely:—

The molecular formula	Melting points
The structural formula	Freezing points
The names	Boiling points
The occurrence in Nature	Densities
All known methods of preparation	
Recommended laboratory methods of preparation	
Refractive Indexes	
Methods of detection and determination	
Derivatives for identification.	

Due to the loose leaf system the material regarding each compound is gathered into one place and consultation is thus confined to a reference to this one place instead of a search through the thirty to forty indexes. Additionally actual references to the original literature are quoted in this one place. Further by publication of Replacement-Addition Issues at frequent intervals the information is kept up to date and the new matter joins the old in its one fixed place in the ENCYCLOPEDIA.

The greatest saving of time made by the use of the ENCYCLOPEDIA would be when it is desired to ascertain if a compound has yet been described. Consulting the ENCYCLOPEDIA will give the answer in a few minutes. Without it the full search of the literature is necessary.

The aim has naturally been to make the ENCYCLOPEDIA complete but errors and omissions are possible in a work of this magnitude. The publishers would be grateful if users would point out any errors or omissions they find for such imperfections can be corrected through future Replacement-Addition Issues.

~~Chemindex Ltd., 76 Cross St., Manchester 2, England.~~

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FOREWORD

As announced in the Foreword to the C₁₁ volumes, from C₁₂ onwards the ENCYCLOPEDIA will no longer present in tabulated form the information available in Beilstein's *Organische Chemie*.

It has been felt that Beilstein and Egloff's "Physical Constants of Hydrocarbons" will be readily available to users of the ENCYCLOPEDIA and that the advantage of completing the work more expeditiously and in fewer volumes will outweigh the disadvantage of asking users to consult Beilstein and Egloff as well.

The volume, supplement and page references to Beilstein and the volume and page references to Egloff are presented just below the names on the first sheet describing a compound.

The information presented in detail in the ENCYCLOPEDIA in this volume onwards is that information which has appeared in the original literature, as quoted in the Abstract Journals, British Abstracts, Chemical Abstracts and *Chemisches Zentralblatt*, since the closing dates of the appropriate sections of the standard works, Beilstein and Egloff.

The ENCYCLOPEDIA thus remains a standard record of all known hydrocarbons with enough detail about each compound to direct workers to the particular original papers which best suit their purpose.

JOSEPH E. FARADAY.

THE REPLACEMENT-ADDITION ISSUES

The information in this volume covers the chemical literature as reported in Beilstein and the Abstract Journals up to 1 January 1955.

Further REPLACEMENT-ADDITION ISSUES will be published for this volume at intervals so that the information will be only a year or two behind the published literature.

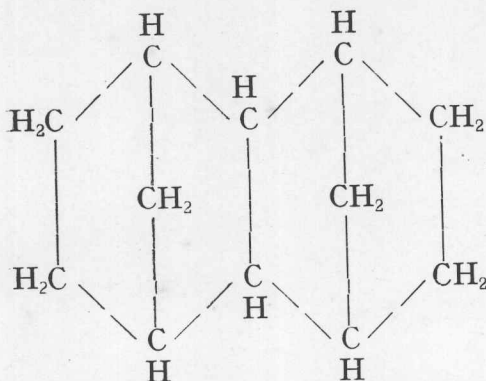
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FIRST REPLACEMENT-ADDITION ISSUE for
Volume 11 up to 1 January 1955 inserted :

Librarian.



$C_{12}H_{18}$
F 000

**TETRACYCLO-PENTANE-1,2,3,4,5-(1,2,3)-PENTANE-
1,2,3,6,7-(6,7)-PENTANE-6,7,8,9,10-(8,9,10)-
PENTANE-8,9,10,11,12**
1-4,5-8-BIS-ENDOMETHYLENE-DECAHYDRO-
NAPHTHALENE
1-4,5-8-BIS-ENDOMETHYLENE-DECALIN

PREPARED :

SHEET 1

P1 by heating the semicarbazone of the corresponding
2-decalone in a sealed tube at 190-200° with sodium
and ethanol (*Ber.* 1938, **71**, 2409 ; *CA* 1939, **33**, 977)
(A) ;

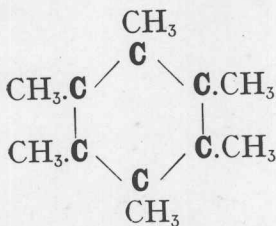
PROPERTIES :

CM1 Mp 36-37° (*item P1*) ;

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HEXAMETHYL-BENZENE

Beilstein 5, MW, 450 ;
 Beilstein 5, SI, 213 ;
 Beilstein 5, SII, 341 ;
 Egloff III, 139 ;

PREPARED :

SHEET 1

- P1 preparation (*Organic Synthesis* 1930, 10, 32) (A) ;
P2 by thermal decomposition of methanol at 400°, with other products (*Bull. Chem. Soc. Japan* 1929, 4, 177 ; C. 1930, I, 193) (C) ;
 P3 from hexabromo-benzene or hexaiodo-benzene with methyl-magnesium-iodide (C. r. 1930, 191, 1460) (C) ;
P4 from technical xylene and methyl-chloride in presence of aluminium-chloride (*Organic Syntheses* 1930, 10, 32) (C) ;
 P5 by dehydrogenation with sulphur at 180-200° of dimeric-1,2,3,4-tetramethyl-butadiene-(1,3) (*Koninkl. Akad. Wetensch. Amsterdam* 1931, 34, 224 ; C. 1931, I, 3348) (C) ;
 P6 from mesidine-hydrochloride with methanol at 240-270° (*JCS* 1931, 1581) (C) ;
 P7 improved preparation (*Rec.* 1935, 54, 745 ; *BCA* 1935 A 1487) (B) ;
 P8 by condensation of xylene with methyl-chloride in presence of aluminium-chloride, with other products (C. r. 1936, 202, 425 ; C. 1936, II, 969) (C) ;
 P9 by passing phenol and methanol over alumina at 400-450° in 41% yield (*Rec.* 1935, 54, 745 ; *CA* 1936, 30, 2938 ; C. 1936, I, 2074) (A,C) ;

HEXAMETHYL-BENZENE

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F 061

PREPARED :

SHEET 2

- P10 from xylenes with methyl-chloride in presence of aluminium-chloride (*J. Gen. Chem. USSR* 1937, 7, 722; *CA* 1937, 31, 5771) (A);
- P11 by the reaction of chloromethyl derivatives of pentamethyl-benzene with chloromethyl-ether (?) (*C. r.* 1937, 204, 1826; *C.* 1937, II, 2986) (C);
- P12 from propionaldehyde, pentamethyl-bromo-benzene, methyl-iodide and magnesium in small yield (*Rev. faculte sci. univ. Istanbul (N.S.)* 1938, 3, 164; *CA* 1938, 32, 5795) (A);
- P13 progressively from mesitylene by addition of the CH_2Br group and reduction with PtO_2 , (*Bl.* 1939, (5), 6, 1025; *CA* 1939, 33, 7286) (A);
- P14 from 2,2,4,4,6,6-hexamethyl-1,3,5-cyclo-hexane-triol with 85% phosphoric-acid, in small yield (*JACS* 1942, 64, 2461; *CA* 1943, 37, 347) (A);
- P15 from 1,1,3,3,4,5-hexamethyl-cyclo-hexane-2,4,6-triol with concentrated sulphuric-acid at 0° in 19.4% yield (*JACS* 1942, 64, 461) (B);
- P16 from phenol and a large excess of methanol dropped on to activated alumina at 375° in an electrically heated silica tube in 70% yield, with other products (*JCS* 1945, 821; *BA* 1946 AII 79; *CA* 1946, 40, 1153/9) (A,B);
- P17 by treating phenol with methanol at 375° in presence of alumina (*BP* 600838; *CA* 1948, 42, 7334/e; *BA* 1948 BII 455) (A,B);
- P18 by dehydration condensation of divinyl-acetylene and methanol over alumina gel at $400-420^\circ$ (*J. Chem. Soc. Japan* 1946, 67, 134; *CA* 1951, 45, 538/i) (A);
- P19 by reaction of equivalent amounts of isopropanol and methanol in the gaseous phase with titanium-oxide at 35° (*J. Chem. Soc. Japan, Pure Chem. Sect.* 1948, 69, 110; *CA* 1951, 45, 539/a) (A);
- P20 by catalytic reaction of benzene and methanol for 4 hours at 400° and 100 atms., with other products (*USP* 2447599; *BA* 1950 BII 896) (B);

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Replace it with this

HEXAMETHYL-BENZENE

$C_{12}H_{18}$
F 061

PREPARED :

SHEET 3

- P21 from benzene and methyl-iodide over an aluminium-chloride catalyst at 40° (*Zhur. Obshchei Khim.* 1951, **45**, 8464/f) (A);
P22 preparation (*Rec.* 1953, **72**, 329; C. 1954, 2593) (C);

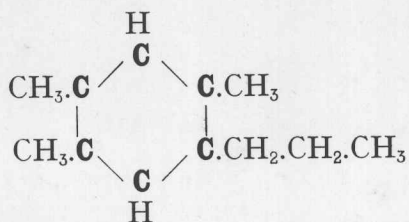
PRPPERTIES :

- CX1 Crystals from benzene (*item P3*);
CX2 Crystals from acetone (*item P5*);

- CME Mp 165.3° (Egloff);
CM1 Mp 165° (*item P16*);
CM2 Mp $160-161^{\circ}$ (*item P18*);
CM3 Mp $166.0-166.5^{\circ}$ (*item P21*);
CM4 Mp $164.4-165.0^{\circ}$ (*item P22*);

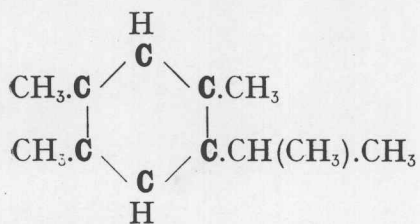
CBE Bp 263.8° at 760 mm. (Egloff);

CP1 Physical constants (Egloff **III**, 128) (E);



1,2,4-TRIMETHYL-5-PROPYL-BENZENE
5-PROPYL-PSEUDO-CUMENE

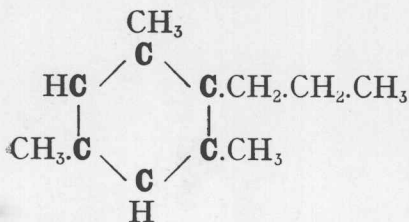
Beilstein **5**, SII, 341 ;
 Egloff **III**, 138 ;



$\text{C}_{12}\text{H}_{18}$
F 061

1,2,4-TRIMETHYL-5-ISOPROPYL-BENZENE

Beilstein 5, MW, 450 ;
Egloff III, 138 ;



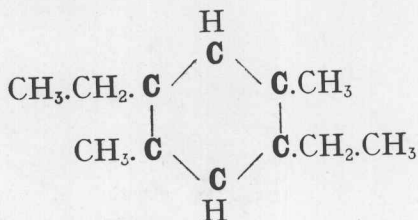
1,3,5-TRIMETHYL-2-PROPYL-BENZENE
2,4,6-TRIMETHYL-PROPYL-BENZENE
PROPYL-MESITYLENE

Beilstein **5**, MW, 449 ;
 Egloff **III**, 138 ;

PREPARED :

SHEET 1

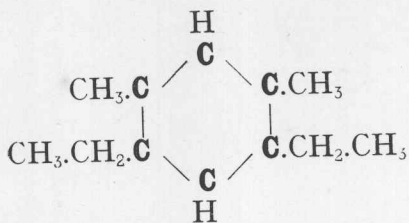
P1 by reduction of 2,4,6-trimethyl-phenyl-ethyl-ketone
 with a $\text{CuO Cr}_2\text{O}_3$ catalyst at 300-400 atms. hydrogen
 pressure and at 250° in 82% yield (*J. Org. Chem.*
 1949, **14**, 1089 ; *CA* 1950, **44**, 3462/h) (A) ;



$\text{C}_{12}\text{H}_{18}$
F 061

1,4-DIMETHYL-2,5-DIETHYL-BENZENE
2,5-DIETHYL-*p*-XYLENE

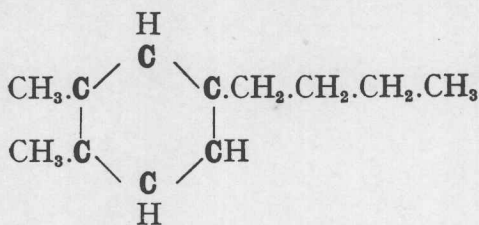
Beilstein **5**, SI, 213 ;
Beilstein **5**, SII, 341 ;
Egloff **III**, 139 ;



$\text{C}_{12}\text{H}_{18}$
F 061

1,5-DIMETHYL-2,4-DIETHYL-BENZENE
1,3-DIMETHYL-4,6-DIETHYL-BENZENE
4,6-DIETHYL-*m*-XYLENE

Beilstein **5**, SII, 341 ;
 Egloff **III**, 139 ;



$\text{C}_{12}\text{H}_{18}$
F 061

1,2-DIMETHYL-4-BUTYL-BENZENE
3,4-DIMETHYL-BUTYL-BENZENE
4-BUTYL-o-XYLENE

PREPARED :

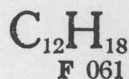
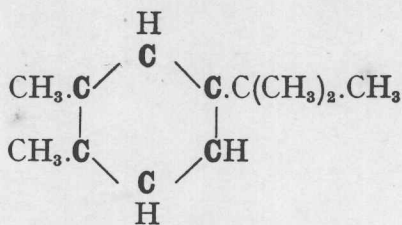
SHEET 1

P1 by reduction of 3,4-dimethyl-phenyl-propyl-ketone with CuO Cr_2O_3 at 300-400 atms. hydrogen pressure and 250° (*J. Org. Chem.* 1949, 14, 1089; *CA* 1950, 44, 3462/h) (A);

PROPERTIES :

CB1 Bp 85° at 6 mm. (*item P1*) ;

CN1 Refractive Index (20/D) 1.4996 (*item P1*) ;



1,2-DIMETHYL-4-tert-BUTYL-BENZENE
4-tert-BUTYL-o-XYLENE

Beilstein **5**, SII, 339 ;
 Egloff **III**, 136 ;

PREPARED :

SHEET 1

- P1 from o-xylene, tert-butyl-chloride and ferric-chloride in 70% yield (*JACS* 1944, **66**, 154 ; *CA* 1944, **38**, 958) (A) ;
- P2 from m-xylene and isobutene at 12-14° in presence of aluminium-chloride in ethyl-bromide in 18% yield, in 60% yield in presence of carbon-tetrachloride in addition (*J. Gen. Chem. USSR* 1943, **13**, 189 ; *BCA* 1944 *III* 188) (B) ;
- P3 by adding tert-butyl-chloride to o-xylene and zinc-chloride in 63.6% yield (*JCS* 1949, 1314 ; *CA* 1949, **43**, 8139/e ; *BA III* 228) (A,B) ;
- P4 by alkylation of 1,2-dimethyl-benzene with isobutene in presence of hydrogen-fluoride (*JACS* 1953, **75**, 361 ; *CA* 1954, **48**, 1296/c) (A) ;

PROPERTIES :

CB1 Bp 208-211° (item P3) ;

1,2-DIMETHYL-4-tert-BUTYL-BENZENE

C₁₂H₁₈
F 061

PROPERTIES :

CM1 Mp -25.6° (*item P4*) ;

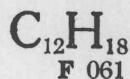
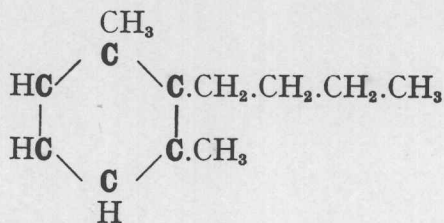
CB1 Bp 208-211° (*item P3*) ;

CB2 Bp 215.1° at 760 mm. (*item P4*) ;

CD1 Density (20/4) 0.8733 (*item P4*) ;

CN1 Refractive Index (20/D) 1.4992 (*item P4*) ;

Set A



1,3-DIMETHYL-3-BUTYL-BENZENE

PREPARED :

SHEET 1

P1 by dehydrogenation of 1,1,3-trimethyl-2-butyl-cyclohexane with selenium at 390-400° for 32 hours (*Helv.* 1936, **19**, 424 ; *C.* 1936, **II**, 464) (C) ;

Set A