

- ng, and
tracking
-272,
Industry;
pp. 188.
ane: Oil
99.
Eng.
- roduction
, Mar.
tment of
. Eng.
. Chem.,
tadiene:
sition of
, pp.
at Lion
pp. 98-
Chem.,
ion of
7, Sept.
944,
1 Gas
as,
terly.
hem and
News,
;ed
1939,
it. Co.,
y Singl
1, Sept.
1450
63. Lee, James A., Synthetic Ammonia Produced from Natural Gas: Chem. and Met. Eng., vol. 52, Dec. 1945, pp. 94-96.
 64. Lowy, Alexander, Chart of Recent Aliphatic Chemicals: Ind. Eng. Chem., news ed., vol. 10, Jan. 10, 1932, p. 6.
 65. Lowy, Alexander, Chart of Products Derived from Acetylene: Ind. Eng. Chem., news ed., vol. 11, May 20, 1933, p. 156.
 66. Mitchell, Guy S., Ammonia - Its Production from Natural Gas: Petrol. Refiner, vol. 25, June 1946, pp. 97-111.
 67. Nieuwland, Julius A. and Vogt, Richard R., The Chemistry of Acetylene, Reinhold Pub. Corp., New York, 1945, 219 pp.
 68. Schoch, E. P., Natural Gas as the Raw Material for New Products. Use of Electric Discharges: Amer. Gas Journ., vol. 162, June 1945, pp. 11-14; Univ. of Texas Pub. No. 4503, Jan. 15, 1945, pp. 36-40.
 69. Smith, H. M., Grandone, Peter, and Rail, H. T., The Production of Motor Fuels from Natural Gas. I. Preliminary Report on the Pyrolysis of Methane: Bureau of Mines Report of Investigations 3143, Oct. 1931, 12 pp.
 70. Teter, J. W., Olson, L. E., and Ries, H. E., Aliphatic Nitriles from Olefins and Ammonia: Paper presented before the Division of Petrol. Chem. of the Amer. Chem. Soc. -General Papers, Apr. 8-12, 1946, Atlantic City, N. J.
 71. Thayer, C. H., Lassiat, R. C., and Lederer, E. R. Houdry Process Applied to the Manufacture of Butadiene: Petrol. Eng., vol. 14, Oct. 1942, pp. 29-30; Auto. Ind., vol. 87, Oct. 15, 1942, pp. 30-32; Rubber Age, vol. 52, Oct. 1942, pp. 39-41; Nat. Petrol. News vol. 34, Sept. 30, 1942, pp. R305-306; Mech. Eng., vol. 64, Nov. 1942, pp. 777-778; Chem. and Met. Eng., vol. 49, Nov. 1942, pp. 116-117.
 72. Thornton, D. P., Jr., Fertilizer from Natural Gas: Nat. Petrol. News, vol. 38, July 3, 1946, pp. R483-488.
 73. Tropsch, Hans, and Egloff, Gustav, High-Temperature Pyrolysis of Gaseous Paraffin Hydrocarbons: Ind. Eng. Chem., vol. 27, Sept. 1935, pp. 1063-1067.
 74. Yeddanapalli, L. M., Decomposition of Methane in Glow Discharge at Liquid-Air Temperature: Jour. Chem. Phys., vol. 10, May 1942, pp. 249-260.

Oxidation

75. Ethyl Alcohol Made from Refinery Ethylene: Chem. and Met. Eng., vol. 52, Nov. 1945, pp. 96-98, 136-139.
76. New Markets: Chem. and Eng. News, vol. 23, Oct. 25, 1945, pp. 1911+.
77. Oil Company's Chemicals from Natural Gas Refinery Makes Formaldehyde, Methanol and Related Compounds: Nat. Petrol. News, vol. 35, Feb. 3, 1943, pp. R72-73.
78. Spirit of the Times; Ethyl and Other Alcohols from Petroleum: Petrol. Refiners, vol. 23, Jan. 1944, pp. 101-104.
79. Benson, G., New Process for Acetic Anhydride: Chem. and Met. Eng., vol. 47, Mar. 1940, pp. 150-151.
80. Brooks, Benjamin T., Synthetic Alcohols and Related Products from Petroleum. I. Olefin Raw Materials: Ind. Eng. Chem., vol. 27, Mar. 1935, pp. 278-282. II. Manufacture of Alcohols and Esters: Ibid., pp. 282-288.

81. Brooks, Benjamin T., and Ellis, Carleton, Alcohols and Related Products from Petroleum Olefins: The Science of Petrol., vol. 4, Oxford Univ. Press, London, 1938, pp. 2805-2811.
82. Daugherty, R. J., Chemicals, Solvents by Natural-Gas Oxidation: Oil and Gas Jour., vol. 41, Jan. 21, 1943, p. 36.
83. Egloff, Gustav, and Hullia, G., Conversion of Oxygen Derivatives of Hydrocarbons into Butadiene: Chem. Rev., vol. 36, Feb. 1945, pp. 63, 141.
84. Egloff, Gustav, Nordman, D. V., and Van Arsdell, P. M., The Oxidation of Aliphatic Hydrocarbons: Oil and Gas Jour., vol. 41, Sept. 26, 1942, pp. 207-210; Oct. 1, 1942, pp. 35-36; Oct. 8, 1942, pp. 49, 51-53.
85. Egloff, Gustav, and Schaad, R. E., The Oxidation of the Paraffin Hydrocarbons: Chem. Rev., vol. 6, March 1929, pp. 91-141.
86. Howes, D. A., The Synthesis of Methanol and Higher Alcohols from Water and Gas: The Science of Petrol., vol. 4, Oxford Univ. Press, 1938, pp. 2812-2821.
87. Linford, Hooper, Chemical Utilization of Natural Gas and Gasoline Hydrocarbons by Oxidation: Petrol. Refiner, vol. 21, Dec. 1942, pp. 69-76; Nat. Petrol. News, vol. 35, Jan. 6, 1943, pp. R15-19; Calif. Oil World, vol. 35, Nov. 14, 1942, pp. 15-21; Petrol. Eng., vol. 14, Jan. 1943, pp. 89, 91-92, 94, 96, 98; (cond.) Oil and Gas Jour., vol. 41, Nov. 12, 1942, pp. 71, 73, 266.
88. McBee, E. T., Hass, H. B., and Wiseman, P. A., Catalytic Vapor-Phase Oxidation of Ethylene: Ind. Eng. Chem., vol. 37, May 1945, pp. 432-438.
89. Marek, L. F., and Hahn, Dorothy A., The Catalytic Oxidation of Organic Compounds in the Vapor Phase: Chem. Cat. Co., Inc., New York, 1932, 486 pp.
90. Reed, R. M., Commercial Production of Pure Hydrogen from Hydrocarbons and Steam: Am. Inst. Chem. Eng., Trans., vol. 41, Aug. 1945, pp. 453-462; Petrol. Refiner, vol. 24, Sept. 1945, pp. 119-122.
91. Taylor, R., Catalytic Production of Ethyl Alcohol from Ethylene: The Science of Petrol., vol. 4, Oxford Univ. Press, London, 1938, pp. 2802-2804.
92. Walker, J. Frederic, Formaldehyde: Reinhold Pub. Corp., New York, 1944, 397 pp.
93. Wiezevich, P. J., and Frolich, P. K., Direct Oxidation of Saturated Hydrocarbons at High Pressure: Ind. Eng. Chem., vol. 26, Mar. 1934, pp. 267-276.

Halogenation

94. Anantakrishnan, S. V., and Venkataraman, R., The Reaction between Ethylene Derivatives and the Halogens: Chem. Rev., vol. 33, Aug. 1943, pp. 27-55.
95. Brooks, Benjamin T., Glycols and Related Compounds from Oil-Gas Olefines: The Science of Petrol., vol. 4, Oxford Univ. Press, London, 1938, pp. 2781-2786.
96. Egloff, Gustav, and Alexander, M., Halogenation of Aliphatic Hydrocarbons: Oil and Gas Jour., vol. 41, Aug. 20, 1942, pp. 41-42, 58-61; Aug. 27, 1942, pp. 39-40, 48; Sept. 3, 1942, pp. 34-37; Sept. 10, 1942, pp. 42, 44, 46.

97. Egloff, Gustav, Schaad, R. E., and Lowy, C. O., Jr., Halogenation of the Paraffin Hydrocarbons: Chem. Rev., vol. 8, Feb. 1931, pp. 1-80.
98. Finger, G. C., Fluorine Compounds in Organic Synthesis: Chem. and Met. Eng., vol. 51, June 1944, pp. 101-103.
99. Groll, H. P. A., and Hearne, G., Halogenation of Hydrocarbons; Substitution of Chlorine and Bromine into Straight-Chain Olefins: Ind. Eng. Chem., vol. 31, Dec. 1939, pp. 1530-1537.
100. Groll, H. P. A., Hearne, G., Rust, F. F., and Vaughan, W. E., Halogenation of Hydrocarbons; Chlorination of Olefins and Olefin-Paraffin Mixtures at Moderate Temperatures; Induced Substitutions: Ind. Eng. Chem., vol. 31, Oct. 1939, pp. 1239-1244.
101. Hadley, E. H., and Bigelow, L. A., Action of Elementary Fluorine upon Organic Compounds; The Vapor Phase Fluorination of Methane: Jour. Amer. Chem. Soc., vol. 62, Dec. 1940, pp. 3302-3303.
102. Hass, H. B., The Chlorination of Methane and Its Homologues: The Science of Petrol., vol. 4, Oxford Univ. Press, 1938, pp. 2787-2794.
103. Hass, H. B., The Addition of Halogens to Olefin Bonds: The Science of Petrol., vol. 4, Oxford Univ. Press, London, 1938, pp. 2777-2780.
104. Hass, H. B., McBee, E. T., and Weber, Paul, Syntheses from Natural-Gas Hydrocarbons. Identity of Monochlorides from Chlorination of Simpler Paraffins: Ind. Eng. Chem., vol. 27, Oct. 1935, pp. 1190-1195.
105. Hass, H. B., McBee, E. T., and Weber, Paul, Chlorination of Paraffins: Ind. Eng. Chem., vol. 28, 1936, p. 533.
106. McBee, E. T., and Hass, H. B., Recent Progress in Chlorination, 1937-1940: Ind. Eng. Chem., vol. 33, Feb. 1941, pp. 137-142.
107. McBee, E. T., Hass, H. B., Neher, C. M., and Strickland, H. Chlorination of Methane: Ind. Eng. Chem., vol. 34, Mar. 1942, pp. 296-300.
108. McGovern, E. W., Chlorohydrocarbon Solvents: Ind. Eng. Chem., vol. 35, Dec. 1943, pp. 1230-1239.
109. Wiezevich, Peter J., and Vesterdal, Hans, G., Halogenated Hydrocarbon Solvents: Chem. Rev., vol. 19, Oct. 1936, pp. 101-117.

Nitrogen

110. Campbell, Arthur William, Nitroparaffins and Derivatives as Heat Sensitizers for Rubber Lattices: Ind. Eng. Chem., vol. 34, Sept. 1942, pp. 1106-1107.
111. Beglin, Charles, and Wampner, H. L., Nitroparaffins as Solvents in the Coating Industry: Ind. Eng. Chem. vol. 34, Sept. 1942, pp. 1091-1096.
112. Boyd, Thomas, and Hass, H. B., Nitration of Methane: Ind. Eng. Chem., vol. 34, Mar. 1942, pp. 300-304.
113. Egloff, Gustav, Alexander, M., and Van Arsdell, P. M., Nitration of Aliphatic Hydrocarbons: Oil and Gas Journal., vol. 41, Oct. 15, 1942, pp. 39-41, 44; Oct. 22, 1942, pp. 49, 51.
114. Ericsson, Ralph L., Solvent Uses of Nitroparaffins: Ind. Eng. Chem., vol. 35, Oct. 1943, pp. 1026-1030.
115. Hass, H. B., Recent Developments in Nitroparaffins: Ind. Eng. Chem., vol. 35, Nov. 1943, pp. 1146-1152.
116. Hass, H. B., Hodge, E. B., and Vanderbilt, B. M., Nitration of Gaseous Paraffins: Ind. Eng. Chem., vol. 28, Mar. 1936, pp. 339-344.

I.C. 7347

117. Hass, H. B., and Riley, Elizabeth F., The Nitroparaffins: Chem. Rev., vol. 32, June 1943, pp. 373-430.
118. Hibshman, H. J., Pierson, E. H., and Hass, H. B., Nitrogen of Ethane: Ind. Eng. Chem., vol. 32, Mar. 1940, pp. 427-429.
119. Hass, H. B., Dorsky, Julian, and Hodge, E. B., Nitration of Propane by Nitrogen Dioxide: Ind. Eng. Chem., vol. 33, Sept. 1941, pp. 1138-1143.

Sulfurization

120. Nat. Petrol. News, Socony-Vac Reports Cheaper Thiophene Process. Forecasts New Uses in Plastics and Dyes: Vol. 37, Jan. 31, 1945, p. 31; Chem. and Met. Eng., vol. 52, Mar. 1945, p. 138; Chem. Ind., vol. 56, Mar. 1945, p. 428.
121. Bacon, R. F., and Boe, E. S., Hydrogen Sulfide Production for Sulfur and Hydrocarbons: Ind. Eng. Chem., vol. 37, May 1945, pp. 469-474.
122. Briscoe, H. V. A., Peel, J. B., and Robinson, P. L., Production of Thiophene by the Interaction of Acetylene and Carbon Disulphide: Chem. Soc. Jour., Nov. 1928, pp. 2857-2858.
123. Brooks, B. T., and Humphrey, I., The Action of Concentrated Sulfuric Acid on Olefins, with Particular Reference to the Refining of Petroleum Distillates: Jour. Amer. Chem. Soc., vol. 40, 1918, pp. 822-856.
124. Ellis, Carleton, Utilization of Sulfur Compounds: pp. 486-488; The Chemistry of Petroleum Derivatives, vol. II: Reinhold Pub. Corp., New York, 1937, 1464 pp.
125. Folkins, H. O., and Miller, E., Carbon Disulfide from Methane and Sulfur: (abs.) Nat. Petrol. News, vol. 37, Feb. 7, 1945, pt. 2, p. R152; Pure Oil News, vol. 27, 1944, p. 14.
126. Rasmussen, H. E., Hansford, R. C., and Sachanen, A. N., Reactions of Aliphatic Hydrocarbons with Sulfur; Production of Olefins, Diolefins, and Thiophene: Ind. Eng. Chem., vol. 38, Apr. 1946, pp. 376-382.
127. Thacker, C. M., and Miller, E., Carbon Disulfide Production: Effect of Catalysts on Reaction of Methane with Sulfur: Ind. Eng. Chem., vol. 36, Feb. 1944, pp. 182-184.
128. Waterman, H. I., and van Viodrop, C., Preparation of Carbon Disulphide from Methane and Hydrogen Sulphide: Soc. Chem. Ind. Jour., vol. 58, Mar. 1939, pp. 109-110.

Desulfurization

129. Byrnes, A. C., Bradley, W. E., and Lee, M. W., Catalytic Desulfurization of Petroleum Stocks by Cobalt Molybdate Process: Nat. Petrol. News, vol. 36, Feb. 2, 1944, pp. R102, R104, R106, R108, R110, R112-113.
130. Cooper, C. W., and Waddle, H. Recovery of Free Sulfur from Natural Gas Gas, vol. 21, July 1945, pp. 31-33.
131. Guthrie, Boyd, and Simmons, M. C., Effects of Desulfurization on the Lead Susceptibility of Distillates from Some Crude Oils from Texas, New Mexico, and Oklahoma: Bureau of Mines Rept. of Investigations, 3729, Nov. 1943, 16 pp.; (cond.) Nat. Petrol. News, vol. 37, Apr. 1945, pp. R309-312, R314-317.

- Chem. Rev.
of Ethane:
Propane
1, pp.
cess. Fore
945, p. 34,
id., vol.
or Sulfur
p. 469-474
ction of
alphide: 0
Sulfuric
ng of Petro
, pp. 822-
-488; The
ub. Corp.,
ane and
, pt. 2,
actions of
s, Diolefins
376-382.
n: Effect
g. Chem.,
n Disulphide
r., vol. 58,
esulfurizati
etrol. News
R112-113.
n Natural Ga
ion on the
from Texas,
stigations,
37, Apr. 4
1450
132. Heineman, Heinz, Digest of United States Patents on Desulfurization: Petrol. Ref., vol. 23, June 1944, pp. 150, 152, 154, 156, 158, 160, 162, 166, 168.
133. Heineman, Heinz, Digest of United States Patents on Desulfurization Issued in 1944: Petrol. Ref., vol. 24, May 1945, pp. 196, 198, 200, 204, 208, 210.
134. Love, F. H., Desulphurization of Gas in the McKennie Field: Petrol. Eng., vol. 15, June 1944, pp. 55-58.
135. Reed, R. M., Desulfurization of Petroleum Hydrocarbons: Oil and Gas Jour., vol. 44, Mar. 30, 1946, pp. 219-220, 222-224, 226.
136. Ryan, J. G., Influence of Sulfur Compounds on Octane Number and Lead Susceptibility of Gasoline: Ind. Eng. Chem., vol. 34, July 1942, pp. 824-832.
137. Schulze, W. A., and Alden, R. C., Catalytic Desulfurization to Improve Aviation Blending Naphthas: Oil and Gas Jour., vol. 38, Nov. 17, 1939, pp. 199-200, 202-204; Ref. and Nat. Gaso. Mfg., vol. 18, Nov. 1939, pp. 96-99, 137.

Alkylation

138. Anhydrous Hydrofluoric Acid; Properties as an Alkylation Catalyst: Nat. Petrol. News., vol. 34, Oct. 28, 1942, pp. R366-368.
139. Alden, R. C., Frey, F. E., Hepp, H. J., and McReynolds, L. A., The Story of Diisopropyl: Oil and Gas Jour. vol. 44, Feb. 9, 1946, pp. 70-73, 103-104, 106-107.
140. Birch, S. F., Dustan, A. E., Fidler, F. A., Pim, F. B., and Tait, T., High-Octane Isoparaffinic Fuels; Production by the Addition of Olefins to Isoparaffins: Ind. Eng. Chem., vol. 31, July 1939, pp. 884-891.
141. Caesar, P. D., and Francis, A. W., Low-Temperature Catalytic Alkylation of Iso-Paraffins: Ind. Eng. Chem., vol. 33, Nov. 1941, pp. 1426-1428; (abs.) Nat. Petrol. News, vol. 33, Oct. 1, 1941, pp. R308+.
142. Egloff, Gustav, and Hull, George, The Alkylation of Alkanes: Chem. Rev., vol. 37, Dec. 1945, pp. 323-399.
143. Clark, Melvin E., Neohexane for 100-Octane Plus: Chem. and Met. Eng., vol. 47, Apr. 1940, pp. 225-227.
144. Frey, F. E., and Hepp, J. H., Noncatalytic Addition of Ethylene to Paraffin Hydrocarbons: Ind. Eng. Chem., vol. 28, Dec. 1936, pp. 1439-1445.
145. Gerhold, C. G., and others, Development of the Hydrogen Fluoride Alkylation Process: Amer. Inst. Chem. Eng. Trans., vol. 39, Dec. 1943, pp. 793-810; Nat. Petrol. News, vol. 36, Mar. 1, 1944, pp. R146+; Petrol. Eng., vol. 15; Ref. Annual, July 1, 1944, pp. 256+.
146. Heineman, Heinz, Digest of United States Patents on Alkylation of Hydrocarbons: I. Petrol. Ref., vol. 21, Nov. 1942, pp. 176-178; II. Ibid., vol. 22, Aug. 1943, pp. 148, 150, 154, 156, 160; III. Ibid., vol. 23, May 1944, pp. 164, 168, 170, 172, 174; IV. Ibid. vol. 24, July 1945, pp. 170, 172, 174, 176-178, 180.
147. Linn, C. B., and Grosse, A. V., Alkylation of Isoparaffins by Olefins in Presence of Hydrogen Fluoride: Ind. Eng. Chem., vol. 37, Oct. 1945, pp. 924-929.

148. Operfell, G. G., and Frey, F. E., Thermal Alkylation and Neohexane: Oil and Gas Jour., vol. 38, Nov. 23, 1939, pp. 50-51; Nov. 30, 1939, pp. 70, 73-74, 75; Amer. Petrol. Inst. Proc., vol. 20 (3) 1939, pp. 78-88; (cond.) Nat. Petrol. News, vol. 31, Nov. 29, 1939, pp. R502, 503, R505-506, R508-509.
149. O'Kelly, A. A., and Sachanen, A. N., Alkylation of Paraffins in Presence of Homogeneous Catalysts; Synthesis of Neohexane and Triptane: Ind. Eng. Chem. vol. 38, May 1946, pp. 462-467.
150. Pardee, W. A., and Dodge, B. F., Catalytic Alkylation of Benzene with Ethylene: Ind. Eng. Chem., vol. 35, Mar. 1943, pp. 273-278; Nat. Petrol. News, vol. 35, Apr. 7, 1943, pp. R180-184.
151. Phillips Petroleum Co., Hydrofluoric Acid Alkylation: Phillips Petro. Co., Chem. Prod. Dept., Bartlesville, Okla., 1946, 380 pp.
152. Pines, H., Grosse, A. V., and Ipatieff, V. N., Alkylation of Paraffin at Low Temperatures on the Presence of Aluminum Chloride: Jour. Amer. Chem. Soc., vol. 64, Jan. 1942, pp. 33-36.
153. Schmerling, Louis, The Mechanism of the Alkylation of Paraffins: Jour. Amer. Chem. Soc., vol. 67, Oct. 1945, pp. 1778-1783.
154. Weinrich, W., Alkylated Cresols from Refinery Gases: Ind. Eng. Chem. vol. 35, Mar. 1943, pp. 264-272.

Isomerization

155. New Process for Catalytic Conversion of Normal into Isobutane: Nat. Petrol. News, vol. 34, June 10, 1942, pp. R194-195.
156. Alden, R. C., Normal Butane Conversion: Nat. Petrol. News, vol. 35, May 5, 1943, pp. R222-224; Petrol. Ref., vol. 22, 1943, pp. 1457; Proc. NGAA 22d Annual Conv., Apr. 1943.
157. Chencicek, J. A., and others, Butane Isomerization; Universal Oil Products Co., Method Using Aluminum Chloride as Catalyst: Nat. Petrol. News, vol. 36, Oct. 4, 1944, pp. R678, R680-682.
158. Coulthrust, L. J., Shell Isomerization Process for Producing Isobutane: Nat. Petrol. News, vol. 33, Dec. 24, 1941, pp. R403-404, R406; Petrol. Eng., vol. 13, Jan. 1942, pp. 113, 116.
159. Egloff, Gustav, Hull, George, and Komarewsky, V. I., Isomerization of Pure Hydrocarbons: Reinhold Pub. Corp., New York, 1942, 499 pp.
160. Evering, B. L., Fragen, N., and Weems, G. S., Commercial Isomerization of Lighter Paraffins: Oil and Gas Jour., vol. 43, Oct. 28, 1944, pp. 77, 81-82, 85-86; Nat. Petrol. News, vol. 36, Nov. 1, 1944, pp. R737-742; Chem. and Eng. News, vol. 22, Nov. 10, 1944, pp. 1898-1902; Petrol. Ref., vol. 23, Nov. 1944, pp. 91-105.
161. Foster, A. L., Isomerization, A Useful But As Yet A Little-Used Tool For the Refiner: Oil and Gas Jour., vol. 41, Feb. 25, 1943, pp. 66, 69, 71-72; Mar. 4, 1943, pp. 51-52.
162. Galstraun, L. S., Isopentane Produced by Liquid-Phase Isomerization: Chem. Met. Eng., vol. 52, Sept. 1945, pp. 109-111.
163. Heinemann, Heinz, Digest of United States Patents on Isomerization of Hydrocarbons: I. Petrol. Ref., vol. 21, Aug. 1942, pp. 136-139; II. Ibid., vol. 22, July 1943, pp. 126, 128, 130, 134; III. Ibid., vol. 23, Aug. 1944, pp. 154, 158, 160, 162, 166, 168; IV. Ibid., vol. 24, Nov. 1945, pp. 208, 210, 212, 214, 216, 217.

164. Murphy, George B., Catalytic Isomerization Will Put Nation Far in Lead
in Aviation-Gasoline Supply: Nat. Petro. News, vol. 33, Dec. 24,
1941, pp. R401-402.
165. Wilson, Edith, Isomerization of Hydrocarbons: Chem. Rev., vol. 21,
Aug. 1937, pp. 129-167.

Hydrogenation

166. Brown, C. L., and Gohr, E. J., The Hydrogenation of Olefin Polymers
for the Manufacture of High-Octane-Number Fuels: Proc., Second
World Petrol. Cong., Paris, 1937, vol. 2, pp. 289-298.
167. Heinemann, Heinz, Digest of United States Patents on Catalytic Hydro-
genation of Hydrocarbons: Petrol. Ref., vol. 23, Jan. 1944, pp. 154,
156, 158, 160, 164.
168. Heinemann, Heinz, Digest of United States Patents on Hydrogenation and
Halogenation: Petrol. Ref., vol. 23, Nov. 1944, pp. 182, 186, 190,
192, 194.
169. Murphree, E. V., Brown, C. L., and Gohr, E. J., Hydrogenation of
Petroleum: Ind. Eng. Chem., vol. 32, Sept. 1940, pp. 1203-1212.
170. Stengel, L. A., and Shreve, R. N., Economic Aspects: Ind. Eng. Chem.,
vol. 32, Sept. 1940, pp. 1212-1215.

Dehydrogenation

171. Frey, F. E., and Huppke, W. F., Equilibrium Dehydrogenation of Ethane,
Propane and the Butanes: Ind. Eng. Chem., vol. 25, Jan. 1933, pp.
54-59.
172. Grosse, A. V., and others, Catalytic Dehydrogenation Process (Gaseous
Paraffins to Olefins): Amer. Petrol. Inst. Proc., vol. 20, (3),
1939, pp. 110-120; Oil and Gas Jour., vol. 38, Nov. 23, 1939, pp.
53, 55-56; (cond.) Nat. Petrol. News, vol. 31, Nov. 29, 1939, pp.
R520-521.
173. Grosse, A. V., and Ipatieff, V. N., Catalytic Dehydrogenation of
Gaseous Paraffins: Ind. Eng. Chem., vol. 32, Feb. 1940, pp. 268-272.
174. Heinemann, Heinz, Digest of United States Patents on Dehydrogenation
and Dehydrohalogenation of Hydrocarbons: Petrol. Ref., vol. 23, Apr.
1944, pp. 142, 146, 148, 150, 152, 154.
175. Heinemann, Heinz, Digest of United States Patents on Hydrogenation
and Dehydrogenation of Hydrocarbons: Petrol. Ref., vol. 24, June
1945, pp. 170, 172, 174, 178, 180.
176. Lassiat, R. C., and Parker, F. D., Butane Dehydrogenation by the Houdry
Process: Oil and Gas Jour., vol. 43, Nov. 18, 1944, pp. 2294; Petrol.
Ref., vol. 23, Nov. 1944, pp. 85-90; Nat. Petrol. News, vol. 36, Dec.
6, 1944, pp. R842-847.
177. Riesz, C. H., and others, Catalytic Dehydrogenation of Natural Gas
Hydrocarbons: Oil and Gas Jour., vol. 43, July 15, 1944, pp. 67-
69.
178. Watson, C. C., and others, Butane Dehydrogenation: Amer. Inst. Chem.
Eng. Trans., vol. 40, June 1944, pp. 309-315; Nat. Petrol. News,
vol. 36, Aug. 2, 1944, pp. R509-510.

Polymerization

179. Catalytic Refining Methods: Oil and Gas Jour., vol. 37, Mar. 30, 1939, pp. 86, 88, 91, 93.
180. Bogk, J. E., Ostergaard, P., and Smoley, E. R., Naphtha Polyform and Gas Reversion Processes: Amer. Petrol. Inst. Proc., vol. 21 sec. III, Nov. 1940, pp. 17-36; (excerpt) Oil and Gas Jour., vol. 39, Dec. 19, 1940, pp. 43-44, 47+.
181. Burk, Robert E., Thompson, Howard E., Weith, Archie J., and Williams, Ira, Polymerization and Its Applications in the Fields of Rubber, Synthetic Resins, and Petroleum: Reinhold Pub. Corp., New York, 1937, 312 pp.
182. Carothers, Wallace H., Polymerization: Chem. Rev., vol. 8, June 1931, pp. 353-426.
183. Egloff, Gustav, Morrell, J. C., and Nelson, Edwin F., Motor Fuels from Polymerization: Ref. and Nat Gaso. Mfg., vol. 16, Nov. 1937, pp. 497+.
184. Ellis, Carleton, Tailoring the Long-Molecule-Plastics: Ind. Eng. Chem., vol. 28, Oct. 1936, pp. 1130-1144.
185. Frey, F. E., and Hepp, H. J., Motor-Fuel Iso-paraffins by Thermal Gas Polymerization: Oil and Gas Jour., vol. 35, Jan. 7, 1937, pp. 40, 43, 46, 49.
186. Heinemann, Heinz, Digest of United States Patents; Polymerization of Hydrocarbons: Petrol. Ref., vol. 23, Feb. 1944, pp. 142, 144, 146, 148.
187. Heinemann, Heinz, Digest of United States Patents on Polymerization of Hydrocarbons: Petrol. Ref., vol. 24, Mar. 1945, pp. 178, 182, 184, 186.
188. Ipatieff, V. N., Catalytic Polymerization of Gaseous Olefins by Liquid Phosphoric Acid; I. Propylene: Ind. Eng. Chem., vol. 27, Sept. 1935, pp. 1067-1069.
189. Ipatieff, V. N., and Corson, B. B., Catalytic Polymerization of Gaseous Olefins by Liquid Phosphoric Acid; II Butylenes: Ind. Eng. Chem., vol. 27, Sept. 1935, pp. 1069-1071.
190. Keith, P. C., Jr., and Ward, J. T., The Thermal Conversion of Low Molecular-Weight Hydrocarbons to Motor Fuels: Chem. and Ind., vol. 27, July 3, 1936, pp. 532-538.
191. McAllister, S. H., The Catalytic Polymerization of Butylenes by Sulfuric Acid: Ref. and Nat Gaso. Mfg., vol. 16, Nov. 1937.
192. Ostergaard, Povl, and Smoley, Eugene R., Gulf Polyform Process: Ref. and Nat. Gaso. Mfg., vol. 19, Sept. 1940, pp. 67-78; Nat. Petrol. News, vol. 32, Sept. 18, 1940, pp. R330-331, R333-334, R336, R337, R340, R342, R344, R346-347.
193. Ridgway, C. M. and Maschwitz, P. A., New Thermal Polymerization Unit Installed by Pure Oil: Oil and Gas Jour., vol. 40, Oct. 30, 1941, pp. 30-31, 33, 48.
194. Ridgway, C. M., Wagner, C. R., and Swanson, H. R., Products of Polymerization: Nat. Petrol. News, vol. 28, Nov. 4, 1936, pp. 47-48, 50-52, 54-55.
195. Wagner, C. R., Production of Gasoline by Polymerization of Olefins: Ind. Eng. Chem., vol. 27, Aug. 1935, pp. 933-936.

Cyclization and Aromatization

- 30,
cm
. 21,
vol.

lliams,
bber,
ork,

ne 1931
uels
. 1937
Eng.

omal

37,
tion of
44, 116
zation
, 182,
by Light
Sept.

of Gas
Eng.

Low
id., va

by Sun

es: Re
Petrol
6, R31

ion Un
0, 19

of Pol
47-16

lefin

1450
196. Cadman, W. H., Thermal Treatment of Gaseous Hydrocarbons; II. Semi-Industrial Production of Aromatic Hydrocarbons from Natural Gas in Persia: Ind. Eng. Chem., vol. 26, Mar. 1934, pp. 315-320.
 197. Grosse, A. V., Morrell, J. C., and Mattox, W. M., Catalytic Cyclization of Aliphatic Hydrocarbons to Aromatics: Ind. Eng. Chem., vol. 32, Apr. 1940, pp. 528-531.
 198. Heinemann, Heinz, Digest of Patents on Catalytic Aromatization and Cyclization: Petrol. Ref., vol. 23, Oct. 1944, pp. 176, 178, 180, 182, 184.
 199. Smith, D. J., and Moore, L. W., First Commercial Hydroforming Plant Now in Operation: Oil and Gas Jour., vol. 39, Mar. 27, 1941, pp. 87-88; Nat. Petrol. News, vol. 33, Apr. 2, 1941, pp. R98-100, 102; Petrol. Eng., vol. 12, Apr. 1941, pp. 23-24.
 200. Trusty, A. W., Petroleum as a Source of the Aromatic Hydrocarbons: Petrol. Ref., vol. 22, Apr. 1943, pp. 83-87.

Hydrocarbon Synthesis

201. Alden, R. C., Conversion of Dry Natural Gas to Liquid Fuels: World Petrol., vol. 17, April 1946, pp. 46-49, 70.
202. Cipoloni, Frank, "Synthetic" Natural Gas from Coal: Amer. Gas Jour., vol. 162, 1945, p. 60.
203. Cotton, Ernest, Germany's Fischer-Tropsch Process: Natural Petrol. News, vol. 38, June 5, 1946, pp. R425-426, 430, 432-434.
204. Egloff, Gustav, Nelson, E. F., and Morrell, J. C., Motor Fuel from Oil Cracking; Production by the Catalytic Water-Gas Reaction: Ind. Eng. Chem., vol. 29, May 1937, pp. 555-559.
205. Faragher, Warren F., Germans Made High Aromatic Aviation Gasoline by Coal Hydrogenation: Nat. Petrol. News, vol. 37, Nov. 7, 1945, pp. R851-855.
206. Fieldner, Arno C., and Fisher, Paul L., Bibliography of Bureau of Mines Investigations on the Production of Liquid Fuels from Oil Shale, Coal, Lignite, and Natural Gas: Bureau of Mines Inf. Circ. 7304, Jan. 1945, 18 pp.
207. Fieldner, Arno C., Storch, Henry H., and Hirst, Lester L., Bureau of Mines Research on the Hydrogenation and Liquefaction of Coal and Lignite: Bureau of Mines Tech. Paper 666, 1944, 69 pp.
208. Fischer, Frey, Roelen, Otto, and Feist W., The Synthesis of Gasoline by the Fischer-Tropsch Process (Translation): Petrol. Ref., vol. 22, Dec. 1943, pp. 97-104.
209. Fischer, Fray, Synthesis of Gasoline from Carbon Monoxide and Hydrogen at Atmospheric Pressure (Translation): Petrol. Ref., vol. 23, Feb. 1944, pp. 112-118.
210. Gordon, A. S., Uncatalyzed Reaction of Natural Gas and Steam: Ind. Eng. Chem. vol. 38, July 1946, pp. 718-720.
211. Keith, P. C., Gasoline from Natural Gas: Oil and Gas Jour., vol. 45, June 15, 1946, pp. 102, 105, 107-108, 111-112; Amer. Gas Assoc. Monthly, vol. 28, June 1946, pp. 253-257, 296-297; Amer. Gas Jour., vol. 164, June 1946, pp. 11-15; Nat. Petrol. News, vol. 38, July 3, 1946, pp. R506-509, 511.

I.C. 7347

212. Komarewsky, V. I., Production of Synthetic Liquid Fuel from Natural Gas: Petrol. Ref., vol. 24, May 1945, pp. 96-98; Petrol. Eng., 16, Aug. 1945, pp. 202, 204, 206.
213. Komarewsky, V. L., and Riesz, C. H., Fischer-Tropsch Synthesis and Gas Industry: Petrol. Ref., vol. 23, Nov. 1944, pp. 91-98.
214. Morrison, G. O., Recent Developments at Shawinigan Chemicals, Ltd. Chem. and Ind., vol. 60, May 24, 1941, pp. 387-392.
215. Ryan, Paul, Synthol Process for Manufacturing Liquid Hydrocarbons Other Products from Natural Gas: Nat. Petrol. News, vol. 37, Apr. 1945, pp. 36-38; Chem. and Ind., vol. 56, May 1945, p. 783; Petrol. Ref., vol. 24, Apr. 1945, p. 130; Gas Age, vol. 95, May 17, 1945, 18-19; Oil and Gas Jour., vol. 43, Mar. 31, 1945, pp. 264-268; vol. 21, July 1945, p. 30.
216. Storch, H. H., Catalyst in Synthetic Liquid Fuel Processes: (abs.) Oil and Gas Jour., vol. 43, Sept. 16, 1944, p. 103; (abs.) Petrol. Ref., vol. 23, Sept. 1944, pp. 144-146; Ind. Eng. Chem., vol. 37, Apr. 1945, pp. 340-351.
217. Underwood, A. J. V., Industrial Synthesis of Hydrocarbons from Hydrogen and Carbon Monoxide: Ind. Eng. Chem., vol. 32, Apr. 1940, pp. 449-454.
218. Wilcox, O. W., Synthetic Gasoline from Natural Gas: World Petrol. vol. 16, An. Ref. Issue, 1945, pp. 103-104, 120.