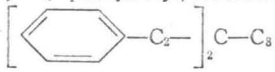
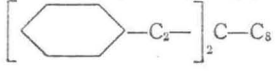
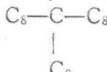
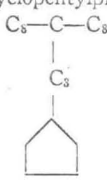
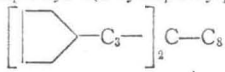
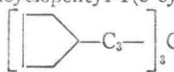
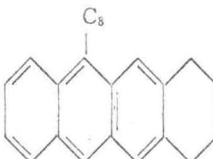


TABLE I. Structures and some pertinent properties of the seven pure hydrocarbons.

TABLE II.^a

PSU No.	Structure ^a and name	Density ^b g/cc	$(1/\eta)(\partial\eta/\partial T)_p$ ^b per °C	Melting point °C	Boiling point at 1 mm °C
18	1-Phenyl-3(2-phenylethyl)hendecane 	0.9094	0.0362	Below -60	197.0
19	1-Cyclohexyl-3(2-cyclohexylethyl)hendecane 	0.8548	0.0482	Glass -40	194.5
25	9-n-Octylheptadecane 	0.7905	0.0306	-13.8	184.0
110	9(3-Cyclopentylpropyl)heptadecane 	0.8178	0.0324	-20.6	188.0
111	1-Cyclopentyl-4(3-cyclopentylpropyl)dodecane 	0.8469	0.0358	Approx. -40	193.0
113	1,7-Dicyclopentyl-4(3-cyclopentylpropyl)heptane 	0.8774	0.0432	-23.7	198.0
179	9-n-Octyl(1,2,3,4-tetrahydro)naphthalene 	1.0122	0.1048	...	245.0

^a Skeletal structures in which notation such as C₈ refers to straight chain of eight carbon atoms containing all appropriate hydrogens.
^b η is the absolute viscosity. The densities and also the slopes of the η vs T curves were determined at 37.8°C (100°F).

varies linearly with pressure.⁹ The particular coil used in this work had a resistance of about 125 ohms at atmospheric pressure. The slope of the pressure resistance curve for this gauge, about 3.2×10^{-4} ohm/bar, was determined using a deadweight gauge. Pressure changes could be measured to ± 1 bar.

The viscometer was calibrated at 37.78°C and atmospheric pressure by filling with fourteen liquids of known viscosity and density and measuring the corresponding roll times. The calibration extended from 1.5 to 990 cp and above 10 cp was in accordance with

⁹ P. W. Bridgman, *The Physics of High Pressure* (G. Bell and Sons, London, 1949), Chaps. 9, 12.

the linear equation

$$\eta = k(d_s - d_l)t + c, \quad (1)$$

where η is the absolute viscosity, k and c constants depending on the dimensions of the apparatus, d_s and d_l the densities of sphere and liquids, respectively, and t the roll time. Below 10 cp the viscosity was determined by reading directly from a calibration curve.

III. EXPERIMENTAL RESULTS

A study of the pressure-viscosity relation has been made on seven of the PSU hydrocarbons and three

PSU No.	Temp. ^d (°C)
18	37.8 60 98.9
19	37.8 60 98.9
25	37.8 60 98.9
110	37.8 60 98.9 135
111	37.8 60 98.9
113	37.8 60 98.9 135
179 ^a	37.8 60 98.9 135

^a The viscosity values were not as pure as 99% at 37.8°C 134.1 at 60°C work reported herein the atmospheric value.
^b Based on atmospheric pressure.
^c The pressure values.
^d The centigrade temperature.

binary mixtures of liquids and some pure compounds are shown. The hydrocarbons are close to each other. PSU 179 was included to show the effect of a rather large molecular weight. The measurements were made at 37.78°C, 60°C, 98.9°C, and 135°C. PSU 19, PSU 25, and PSU 110 and the mixtures were made at the above temperatures. The viscometer calibration was made at the pressure in question of the viscosity measurements at 98.9°C, and PSU 110 and 98.9°C the measurements were determined over the range of measurements.¹⁰

¹⁰ The temperatures were 275°F, respectively 135°C.
¹¹ Cutler, McMickle, *J. Res. Nat. Bur. Stand.* 29, 727 (1958).