Physical constants of purified n-heptane: d_4^{20} 0.6832; n_D^{20} 1.3879; according to the literature [8]: d_4^{20} 0.68376; n_D^{20} 1.38764; b.pt 98.1-98.4°C (760 mm).

The reaction products were distilled in a rectifying column of the above-mentioned efficiency.

For the catalytic cracking experiments aluminosilicate catalyst was used, which was heated before the experiment at 500°C in a current of air for 3 hours. For the results of these experiments we refer to tables 1 and 2.

TABLE 1

Cracking of n-heptane (τ = 3 hours)

No. Exp.	Quantity of n-heptane, g	Temp. °C	P, atm.	Yield of liquid products	Including				Gas and liquid products with b.pt < 48°C (by difference)	n_D^{20} res.	$\frac{> C_7}{< C_7}$ ***
					fr. 48–76°	fr. 76–96°	fr. 96–99°	residue			
				in % on feed *							
a) Thermal (under n-heptane pressure)											
14	35.45	420	480–760	68.3	5.2	4.2	19.7	30.1	40.8	1.4512	0.65
31	40.5	420	750–1120	78.9	4.7	3.7	28.6	32.0	31.0	1.4480	0.90
13	41.0	420	1000–1300	88.5	3.2	3.4	39.8	33.1	20.5	1.4370	1.40
12	45.0	420	1750–1980	94.2	2.1	1.9	56.6	26.5	12.9	1.4262	1.77
11	49.0	420	3100	96.7	1.4	2.1	59.3	27.0	10.2	1.4262	2.33
48	40.0	415	100–170	75.3	3.6	3.3	33.3	22.11	37.7	1.4556	0.54
b) Under hydrogen pressure											
40	40.0	415	350	94.0	1.0	2.5	71.8	4.2	20.5	1.4050	
39	40.0	415	740	87.7	1.4	3.0	65.1	3.0	27.5	1.4006	
38	40.0	415	1200	78.2	1.8	1.3	52.2	6.2	38.5	1.3920	
c) Catalytic ** (under n-heptane pressure)											
52	30.0	420	330–550	62.4	2.4	4.8	35.0	6.6	51.1	1.4725	
49	38.5	420	950–1250	47.8	2.9	4.8	20.9	6.9	64.5	1.4712	
54	30.0	410	300–400	85.7	2.4	5.7	54.5	6.6	31.8	1.4281	
57	30.0	410	300–400	82.0	1.4	4.9	49.3	11.3	33.1	1.4112	
55	35.0	410	520–850	69.0	2.9	6.5	30.6	14.9	45.1	1.4236	
56	39.4	410	650–980	70.2	2.9	6.5	37.4	7.9	45.3	1.4480	
46	40.0	415	100–190	69.3	1.8	3.5	42.8	5.3	46.6	1.4625	
d) Catalytic under hydrogen pressure											
43	40.0	415	290	72.2	1.8	4.8	45.5	3.6	44.3	1.4358	
42	40.0	415	770	57.9	2.3	5.5	29.6	7.5	55.1	1.4032	
44	40.0	415	1240	51.7	1.6	5.5	29.4	5.3	61.2	1.3937	

* Allowing for a loss of 2 g when filling the reactors.

** In the presence of 30% wt aluminosilicate catalyst. In this investigation the pressure was not raised to above 1250 atm. to keep the ratio catalyst/n-heptane accurately constant when the n-heptane in the reactor is vibrated.

*** $> C_7$ fraction with b.pt upwards of 99°C; $< C_7$ products with b.pt lower than 76°C.