

l had a density of 0.9674  
e pressure of 134.0°C, and  
with the polarizing micro-  
meter and showed typical  
refringence.

PDTA runs on several

ethylene under Pressure

Trace	Crystallization temperature $T_x$ , °C
	124.3
	127.6
	134.4
	138.0
	139.9
	143.9
	153.4
	155.2
	156.7
	156.8
	160.8
	—
	166.2
	—
	169.4
	—
	170.3
	—
	170.8
	178.1
	—

as used for several runs.  
d peak-temperatures.  
g temperature at atmo-  
spheric pressure and has a  
determination and has a  
±0.7°C. All other points

plateau which occurs upon  
t pressure. In any such  
ure will depend upon the  
cooling rate was approxi-

### PDTA of Ethylene-Butene Copolymer

As in the homopolymer case, the sample was always crystallized at atmospheric pressure before each of the runs listed in Table II. It can be seen that the copolymer melting and crystallization temperatures lie below those of the homopolymer.

TABLE II  
Melting and Crystallization of Ethylene-Butene Copolymer under Pressure

Trace	$P$ , bars	Melting temperature $T_m$ , °C	Crystallization temperature $T_x$ , °C
Avg	1	128.3	119.8
77	303	134.1	124.0
67	718	142.4	132.6
73	1180	150.3	139.4
71	2040	164.8	153.0
75	2920	178.1	165.6

### PDTA of Extended-Chain Polyethylene

It was not possible to produce extended-chain crystals in the PDTA cell because fixed temperatures could not be maintained at high pressure with the control system designed for DTA. Occasional leaks in the pressurization system (not in the PDTA cell) made it difficult to hold pressures above 3000 bars for long periods of time. Therefore a sample of extended-chain polyethylene crystallized at 214°C and 5030 bars in a preparative apparatus,<sup>14</sup> was used for the third series of PDTA runs. The sample had a density of 0.9906 g/cm<sup>3</sup>. Spherulites of 65  $\mu$  diameter were present in sections examined in the polarizing microscope. Replicas of the fracture surface showed numerous extended-chain lamellae of 5000 Å thickness. A fresh piece of this material was used in each PDTA run. The results are listed in Table III.

TABLE III  
Melting of Extended Chain Polyethylene under Pressure

Trace	$P$ , bars	Melting temperature $T_m$ , °C
109	1	142.4
117	211	149.8
118	498	157.3
116	807	165.0
113	2370	197.3
112	2920	209.8
119	4130	229.0