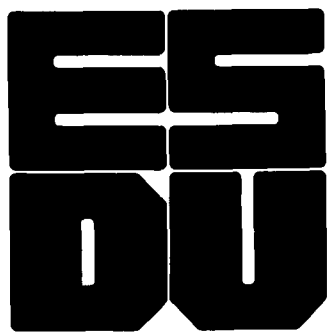




Engineering Sciences Data

Item Number

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February 1986

86001

Vapour pressures and critical points of liquids

Part 2C: alkadienes and alkynes

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The work on this Item was carried out in the Internal Flow and Physical Properties Group of the Engineering Sciences Data Unit. The initial assessment of the available information and the construction and subsequent development of the Item was undertaken by

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in consultation with Dr D.Ambrose.

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VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS

PART 2C: ALKADIENES AND ALKYNES

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VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS
PART 2C: ALKADIENES AND ALKYNES

1. INTRODUCTION

This Data Item presents saturated vapour pressures of the alkadienes and alkynes listed, with alternative names if any, in Table 1 (page 2).

The values of vapour pressure given in the Tables have been obtained by evaluating, for each compound, a Wagner equation of the form

$$\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{3/2} + b_3q^3 + b_4q^6), \quad (1)$$

where T is the temperature in kelvins ($T = 273.15 +$ the Celsius temperature), on the International Practical Temperature Scale 1968 (IPTS 68), p is the vapour pressure in kPa, T_c , p_c are the critical temperature and critical pressure respectively and $q = 1 - T/T_c$.

Equation (1) was fitted to the experimental and calculated data that had been selected and weighted in accordance with a critical assessment of all the data. Note that estimated values of T_c are rounded to the nearest degree Celsius and that values in other units are obtained by exact conversion.

Table 2 is an index to Tables 5 onward. Table 3 gives T_c , p_c and the coefficients b_1 , b_2 , b_3 and b_4 for each compound that, when used in Equation (1), give p in kPa for T in kelvins. Table 4 shows for each compound, the normal boiling point in kelvins, degrees Celsius and degrees Fahrenheit, the value of dp/dT at the normal boiling point and the acentric factor.

Tables 5 to 11 present values of vapour pressure, in kPa, at 5 K intervals of temperature down to a temperature just above the freezing point, T_f , or an arbitrary lower limit where the freezing point is not known.

Tables 5(C) to 11(C) present the vapour pressures, in atm or mmHg, at intervals of 5 degrees C and Tables 5(F) to 11(F) give the values, in psia, at intervals of 10 degrees F. In Tables 5(C) to 11(C) the units of pressure change from atm to mmHg at approximately 2 atm.

The sources of experimental and calculated data for each compound, on which the tabulated values are based, are detailed in Appendix A. The uncertainties in the tabulated values of vapour pressure that the user should allow for are discussed and tabulated in Appendix B.

A full explanation of the correlation procedure used to derive the tabulated values of vapour pressure together with notation and units, conversion factors and References is given in the Introductory Data Item, Reference 1.

2. REFERENCE

1. ESDU

Vapour pressures and critical points of liquids. Introduction to Data Items issued after September 1984. Item No.84021, ESDU International Ltd, 1984.

TABLE 1
LIST of COMPOUNDS

The empirical formula, name and alternative names, if any, of each compound considered in this Data Item are as follows:

No.	Emp. Form.	Name	Alternative Names
C ₃ and C ₄ ALKADIENES			
1	C ₃ H ₄	Propadiene	Allene
2	C ₄ H ₆	Buta-1,2-diene	1,2-Butadiene
3		Buta-1,3-diene	1,3-Butadiene
PENTADIENES			
4	C ₅ H ₈	Penta-1,2-diene	1,2-Pentadiene
5		Penta-1,cis-3-diene	1,cis-3-Pentadiene
6		Penta-1,trans-3-diene	1,trans-3-Pentadiene
7		Penta-1,4-diene	1,4-Pentadiene
8		Penta-2,3-diene	2,3-Pentadiene
9		3-Methylbuta-1,2-diene	3-Methyl-1,2-butadiene
10		2-Methylbuta-1,3-diene	2-Methyl-1,3-butadiene Isoprene
HEXADIENES and HEXATRIENES			
11	C ₆ H ₁₀	Hexa-1,trans-3-diene	1,trans-3-Hexadiene
12		Hexa-1,trans-4-diene	1,trans-4-Hexadiene
13		Hexa-1,5-diene	1,5-Hexa-1,5-diene
14		Hexa-trans-2,trans-4-diene	trans-2,trans-4-Hexadiene
15		2,3-Dimethylbuta-1,3-diene	2,3-Dimethyl-1,3-butadiene
16	C ₆ H ₈	Hexa-1,cis-3,5-triene	1,cis-3,5-Hexatriene
C ₂ to C ₄ ALKYNES			
17	C ₂ H ₂	Acetylene	Ethyne
18	C ₃ H ₄	Propyne	Allylene
19	C ₄ H ₆	But-1-yne	1-Butyne
20		But-2-yne	2-Butyne
PENTYNES			
21	C ₅ H ₈	Pent-1-yne	1-Pentyne
22		Pent-2-yne	2-Pentyne
23		3-Methylbut-1-yne	3-Methyl-1-butyne
HEXYNES			
24	C ₆ H ₁₀	Hex-1-yne	1-Hexyne
25		Hex-2-yne	2-Hexyne
26		Hex-3-yne	3-Hexyne
HEPTYNES			
27	C ₇ H ₁₂	Hept-1-yne	1-Heptyne
28		Hept-2-yne	2-Heptyne
29		Hept-3-yne	3-Heptyne
OCTYNES			
30	C ₈ H ₁₄	Oct-1-yne	1-Octyne
31		Oct-2-yne	2-Octyne
32		Oct-3-yne	3-Octyne
33		Oct-4-yne	4-Octyne
ALK-EN-YNES and ALKADIYNES			
34	C ₄ H ₄	But-1-en-3-yne	Vinylacetylene
35	C ₄ H ₂	Buta-1,3-diyne	Diacetylene
36	C ₆ H ₆	Hexa-1,5-dien-3-yne	Divinylacetylene

TABLE 2
INDEX to MAIN TABLES

The locations of the Tables giving vapour pressures in various units are as follows:-

		kPa v K		atm or mmHg v deg.C		psia v deg.F	
No.	Name	Table	Pages	Table	Pages	Table	Pages
C ₃ and C ₄ ALKADIENES							
1	Propadiene	5	6, 7	5(C)	20,21	5(F)	34,35
2	Buta-1,2-diene	5	6, 7	5(C)	20,21	5(F)	34,35
3	Buta-1,3-diene	5	6, 7	5(C)	20,21	5(F)	34,35
PENTADIENES							
4	Penta-1,2-diene	6	8, 9	6(C)	22,23	6(F)	36,37
5	Penta-1,cis-3-diene	6	8, 9	6(C)	22,23	6(F)	36,37
6	Penta-1,trans-3-diene	6	8, 9	6(C)	22,23	6(F)	36,37
7	Penta-1,4-diene	6	8, 9	6(C)	22,23	6(F)	36,37
8	Penta-2,3-diene	6	8, 9	6(C)	22,23	6(F)	36,37
9	3-Methylbuta-1,2-diene	6	8, 9	6(C)	22,23	6(F)	36,37
10	2-Methylbuta-1,3-diene	6	8, 9	6(C)	22,23	6(F)	36,37
HEXADIENES and HEXATRIENES							
11	Hexa-1,trans-3-diene	7	10,11	7(C)	24,25	7(F)	38,39
12	Hexa-1,trans-4-diene	7	10,11	7(C)	24,25	7(F)	38,39
13	Hexa-1,5-diene	7	10,11	7(C)	24,25	7(F)	38,39
14	Hexa-trans-2,trans-4-diene	7	10,11	7(C)	24,25	7(F)	38,39
15	2,3-Dimethylbuta-1,3-diene	7	10,11	7(C)	24,25	7(F)	38,39
16	Hexa-1,cis-3,5-triene	7	10,11	7(C)	24,25	7(F)	38,39
C ₂ to C ₄ ALKYNES							
17	Acetylene	8	12,13	8(C)	26,27	8(F)	40,41
18	Propyne	8	12,13	8(C)	26,27	8(F)	40,41
19	But-1-yne	8	12,13	8(C)	26,27	8(F)	40,41
20	But-2-yne	8	12,13	8(C)	26,27	8(F)	40,41
PENTYNES							
21	Pent-1-yne	9	14,15	9(C)	28,29	9(F)	42,43
22	Pent-2-yne	9	14,15	9(C)	28,29	9(F)	42,43
23	3-Methylbut-1-yne	9	14,15	9(C)	28,29	9(F)	42,43
HEXYNES							
24	Hex-1-yne	9	14,15	9(C)	28,29	9(F)	42,43
25	Hex-2-yne	9	14,15	9(C)	28,29	9(F)	42,43
26	Hex-3-yne	9	14,15	9(C)	28,29	9(F)	42,43
HEPTYNES							
27	Hept-1-yne	10	16,17	10(C)	30,31	10(F)	44,45
28	Hept-2-yne	10	16,17	10(C)	30,31	10(F)	44,45
29	Hept-3-yne	10	16,17	10(C)	30,31	10(F)	44,45
OCTYNES							
30	Oct-1-yne	10	16,17	10(C)	30,31	10(F)	44,45
31	Oct-2-yne	10	16,17	10(C)	30,31	10(F)	44,45
32	Oct-3-yne	10	16,17	10(C)	30,31	10(F)	44,45
33	Oct-4-yne	10	16,17	10(C)	30,31	10(F)	44,45
ALK-EN-YNES and ALKADIYNES							
34	But-1-en-3-yne	11	18,19	11(C)	32,33	11(F)	46,47
35	Buta-1,3-diyne	11	18,19	11(C)	32,33	11(F)	46,47
36	Hexa-1,5-dien-3-yne	11	18,19	11(C)	32,33	11(F)	46,47

TABLE 3

CONSTANTS in EQUATION (1)

This Table lists the constants for each compound that, when used in the equation

$$\ln p = \ln p_c + (T_c/T)(b_1q + b_2q^{3/2} + b_3q^3 + b_4q^6), \quad \text{where } q = 1 - T/T_c,$$

give p in kPa for T in kelvins.

Name	T_c K	p_c kPa	b_1	b_2	b_3	b_4
C₃ and C₄ ALKADIENES						
Propadiene	392.15	5080	-6.52506	1.06581	-1.17050	-3.82364
Buta-1,2-diene	452.15	4523	-6.89490	1.36596	-2.48983	-1.80775
Buta-1,3-diene	425.17	4277	-6.88087	1.26267	-2.20171	-2.63659
PENTADIENES						
Penta-1,2-diene	491.15	4000	-7.19856	1.39206	-2.95182	-2.12934
Penta-1,cis-3-diene	490.15	3945	-7.19154	1.46517	-3.09948	-1.73563
Penta-1,trans-3-diene	487.15	3891	-7.14046	1.38290	-2.86243	-1.83465
Penta-1,4-diene	462.15	3786	-7.09732	1.37651	-2.83000	-1.91094
Penta-2,3-diene	497.15	4170	-7.27956	1.51867	-3.30159	-1.64732
3-Methylbuta-1,2-diene	489.15	4247	-7.15714	1.40753	-2.88170	-1.92054
2-Methylbuta-1,3-diene	479.15	4007	-6.98444	1.25703	-2.53619	-2.09807
HEXADIENES and HEXATRIENES						
Hexa-1,trans-3-diene	520.15	3533	-7.43806	1.44602	-3.42223	-2.03270
Hexa-1,trans-4-diene	510.15	3258	-7.29575	1.42628	-3.17570	-1.97109
Hexa-1,5-diene	501.15	3033	-7.18256	1.40837	-2.97839	-1.92855
Hexa-trans-2,trans-4-diene	536.15	3388	-7.36830	1.43618	-3.30068	-2.00304
2,3-Dimethylbuta-1,3-diene	525.15	3754	-7.20082	1.41245	-3.01174	-1.93183
Hexa-1,cis-3,5-triene	540.15	3569	-7.29916	1.42424	-3.17868	-1.97967
C₂ to C₄ ALKYNES						
Acetylene	308.32	6139	-6.88704	1.23455	-2.06534	-2.60243
Propyne	402.39	5626	-6.99496	1.26007	-2.45759	-1.98009
But-1-yne	443.15	4947	-7.16081	1.30047	-2.70955	-2.28021
But-2-yne	473.15	4874	-7.12815	1.29087	-2.65894	-2.22473
PENTYNES						
Pent-1-yne	481.15	4165	-7.34560	1.34414	-3.07631	-2.20536
Pent-2-yne	505.15	4165	-7.35991	1.34514	-3.10044	-2.21837
3-Methylbut-1-yne	463.15	4200	-7.23370	1.32766	-2.87878	-2.12719
HEXYNES						
Hex-1-yne	516.15	3625	-7.58252	1.38513	-3.50435	-2.34800
Hex-2-yne	535.15	3625	-7.60918	1.38947	-3.55200	-2.36541
Hex-3-yne	531.15	3625	-7.58475	1.38551	-3.50746	-2.35165
HEPTYNES						
Hept-1-yne	547.15	3210	-7.79680	1.42818	-3.90193	-2.45357
Hept-2-yne	564.15	3210	-7.83733	1.43872	-3.97919	-2.46845
Hept-3-yne	557.15	3210	-7.83363	1.43787	-3.97254	-2.46615
OCTYNES						
Oct-1-yne	574.15	2875	-8.05038	1.48561	-4.38491	-2.55081
Oct-2-yne	591.15	2875	-8.06050	1.48826	-4.40466	-2.55335
Oct-3-yne	584.15	2867	-8.04856	1.48623	-4.38153	-2.54953
Oct-4-yne	582.15	2856	-8.03858	1.47965	-4.36009	-2.55267
ALK-EN-YNES and ALKADIYNES						
But-1-en-3-yne	443.15	5200	-7.09591	1.30811	-2.63898	-2.02320
Buta-1,3-diyne	453.15	5200	-6.95801	1.29994	-2.41382	-1.88683
Hexa-1,5-dien-3-yne	543.15	4100	-7.41927	1.32742	-3.19894	-2.29244

TABLE 4
NORMAL BOILING POINTS and ACENTRIC FACTORS

Name	Normal Boiling Point						Ac. Fctr.
	p=101.325 kPa		p=760 mmHg		p=14.69595 psia		
	T	dT/dp	T	dT/dp	T	dT/dp	
	K	K per kPa	deg.C	deg.C per mmHg	deg.F	deg.F per psia	
C ₃ and C ₄ ALKADIENES							
Propadiene	238.45	0.2309	-34.70	0.03079	-30.47	2.866	0.127
Buta-1,2-diene	284.05	0.2656	10.90	0.03541	51.63	3.297	0.187
Buta-1,3-diene	268.76	0.2532	-4.39	0.03376	24.09	3.142	0.190
PENTADIENES							
Penta-1,2-diene	318.00	0.2905	44.85	0.03873	112.72	3.605	0.248
Penta-1,cis-3-diene	317.21	0.2909	44.06	0.03878	111.31	3.610	0.242
Penta-1,trans-3-diene	315.17	0.2911	42.02	0.03881	107.64	3.612	0.237
Penta-1,4-diene	299.11	0.2782	25.96	0.03709	78.72	3.453	0.229
Penta-2,3-diene	321.40	0.2901	48.25	0.03867	118.86	3.600	0.256
3-Methylbuta-1,2-diene	313.98	0.2868	40.83	0.03823	105.49	3.559	0.238
2-Methylbuta-1,3-diene	307.21	0.2864	34.06	0.03818	93.30	3.554	0.215
HEXADIENES and HEXATRIENES							
Hexa-1,trans-3-diene	345.00	0.3110	71.85	0.04146	161.33	3.860	0.295
Hexa-1,trans-4-diene	338.38	0.3134	65.23	0.04178	149.41	3.889	0.267
Hexa-1,5-diene	332.66	0.3152	59.51	0.04202	139.12	3.912	0.244
Hexa-trans-2,trans-4-diene	355.69	0.3250	82.54	0.04333	180.57	4.033	0.281
2,3-Dimethylbuta-1,3-diene	341.96	0.3148	68.81	0.04197	155.86	3.907	0.248
Hexa-1,cis-3,5-triene	355.33	0.3252	82.18	0.04336	179.92	4.036	0.268
C ₂ to C ₄ ALKYNES							
Acetylene	188.45	0.1705	-84.70	0.02273	-120.45	2.115	0.192
Propyne	249.97	0.2243	-23.18	0.02990	-9.73	2.784	0.216
But-1-yne	281.20	0.2513	8.05	0.03350	46.49	3.119	0.247
But-2-yne	300.11	0.2696	26.96	0.03595	80.53	3.346	0.241
PENTYNES							
Pent-1-yne	313.32	0.2795	40.17	0.03727	104.30	3.469	0.283
Pent-2-yne	329.21	0.2932	56.06	0.03909	132.91	3.639	0.286
3-Methylbut-1-yne	299.49	0.2706	26.34	0.03608	79.41	3.358	0.260
HEXYNES							
Hex-1-yne	344.52	0.3041	71.37	0.04054	160.47	3.774	0.330
Hex-2-yne	357.67	0.3147	84.52	0.04196	184.14	3.906	0.335
Hex-3-yne	354.57	0.3129	81.42	0.04171	178.56	3.883	0.330
HEPTYNES							
Hept-1-yne	372.89	0.3263	99.74	0.04350	211.53	4.049	0.372
Hept-2-yne	385.15	0.3356	112.00	0.04474	233.60	4.165	0.380
Hept-3-yne	380.31	0.3315	107.16	0.04420	224.89	4.114	0.379
OCTYNES							
Oct-1-yne	399.36	0.3450	126.21	0.04599	259.18	4.281	0.422
Oct-2-yne	411.35	0.3550	138.20	0.04732	280.76	4.405	0.423
Oct-3-yne	406.38	0.3512	133.23	0.04683	271.81	4.359	0.421
Oct-4-yne	404.99	0.3505	131.84	0.04673	269.32	4.350	0.420
ALK-EN-YNES and ALKADIYNES							
But-1-en-3-yne	278.74	0.2498	5.59	0.03330	42.06	3.100	0.233
Buta-1,3-diyne	282.46	0.2578	9.31	0.03437	48.76	3.200	0.204
Hexa-1,5-dien-3-yne	355.87	0.3147	82.72	0.04196	180.89	3.906	0.300

TABLE 5

VAPOUR PRESSURE of C_3 and C_4 ALKADIENES

Units: kPa v. K

1	Propadiene			Allene
2	Buta-1,2-diene			1,2-Butadiene
3	Buta-1,3-diene			1,3-Butadiene
No.	1	2	3	
T_c (K)	392.15	452.15	425.17	
p_c (kPa)	5080	4523	4277	
T		p		
K		kPa		
450		4378.4		
445		4059.8		
440		3761.9		
435		3482.3		
430		3219.7		
425		2972.9	4265.3	
420		2741.0	3936.4	
415		2523.1	3630.5	
410		2318.7	3344.7	
405		2126.9	3077.2	
400		1947.2	2826.7	
395		1779.1	2592.3	
390	4902.6	1621.9	2372.9	
385	4512.3	1475.2	2167.9	
380	4148.1	1338.5	1976.4	
375	3807.6	1211.4	1797.9	
370	3489.1	1093.4	1631.6	
365	3191.2	984.02	1476.9	
360	2912.9	882.93	1333.4	
355	2653.0	789.70	1200.4	
350	2410.8	703.94	1077.4	
345	2185.3	625.27	964.03	
340	1975.7	553.32	859.69	
335	1781.2	487.71	763.93	
330	1601.2	428.10	676.31	
325	1434.8	374.11	596.37	
320	1281.6	325.41	523.68	
315	1140.7	281.66	457.82	
310	1011.5	242.52	398.36	
305	893.43	207.67	344.90	
300	785.87	176.80	297.04	
295	688.21	149.58	254.39	
290	599.85	125.72	216.57	
285	520.24	104.94	183.21	
280	448.80	86.939	153.95	
275	384.97	71.463	128.44	
270	328.24	58.252	106.33	
265	278.06	47.061	87.320	
260	233.94	37.660	71.083	
255	195.36	29.832	57.330	
250	161.86	23.376	45.778	

TABLE 5 continued

VAPOUR PRESSURE of C_3 and C_4 ALKADIENES continued

Units: kPa v. K

No.	1	2	3
continued			
T K	p kPa		
245	132.97	18.106	36.166
240	108.24	13.851	28.246
235	87.240	10.456	21.791
230	69.575	7.7806	16.590
225	54.853	5.7018	12.451
220	42.713	4.1099	9.2027
215	32.815	2.9102	6.6896
210	24.845	2.0215	4.7762
205	18.514	1.3753	3.3444
200	13.560	9.15E-1	2.2929
195	9.7459	5.94E-1	1.5363
190	6.8613	3.76E-1	1.0039
185	4.7224	2.31E-1	6.38E-1
180	3.1706	1.37E-1	3.94E-1
175	2.0713	7.90E-2	2.35E-1
170	1.3129	4.38E-2	1.36E-1
165	8.05E-1	2.33E-2	7.52E-2
160	4.76E-1	1.18E-2	
155	2.70E-1	5.71E-3	
150	1.46E-1	2.61E-3	
145	7.52E-2	1.12E-3	
140	3.66E-2	4.51E-4	
T_f	137	137	164

TABLE 6
VAPOUR PRESSURE of PENTADIENES

Units: kPa v. K

4	Penta-1,2-diene				1,2-Pentadiene		
5	Penta-1,cis-3-diene				1,cis-3-Pentadiene		
6	Penta-1,trans-3-diene				1,trans-3-Pentadiene		
7	Penta-1,4-diene				1,4-Pentadiene		
8	Penta-2,3-diene				2,3-Pentadiene		
9	3-Methylbuta-1,2-diene				3-Methyl-1,2-butadiene		
10	2-Methylbuta-1,3-diene				2-Methyl-1,3-butadiene	Isoprene	
No.	4	5	6	7	8	9	10
T _c (K)	491.15	490.15	487.15	462.15	497.15	489.15	479.15
p _c (kPa)	4000	3945	3891	3786	4170	4247	4007
T	p						
K	kPa						
495					4042.0		
490	3933.6	3936.4			3759.7		
485	3658.2	3660.8	3771.3		3495.4	3999.1	
480	3400.5	3403.5	3507.1		3247.1	3718.9	
475	3158.2	3162.0	3259.5		3013.5	3455.8	3773.6
470	2930.3	2934.8	3026.6		2793.6	3208.4	3509.4
465	2715.7	2721.0	2807.5		2586.6	2975.4	3260.9
460	2513.7	2519.7	2601.2	3664.1	2391.8	2756.0	3027.0
455	2323.6	2330.2	2406.9	3395.5	2208.5	2549.5	2806.6
450	2144.7	2151.9	2224.1	3144.5	2036.2	2355.1	2598.9
445	1976.4	1984.2	2052.0	2909.1	1874.2	2172.2	2403.2
440	1818.4	1826.7	1890.3	2688.2	1722.2	2000.3	2219.0
435	1670.1	1678.7	1738.4	2480.7	1579.6	1838.9	2045.6
430	1531.0	1539.9	1595.8	2286.0	1446.1	1687.4	1882.6
425	1400.8	1409.9	1462.1	2103.1	1321.1	1545.5	1729.5
420	1279.0	1288.2	1337.0	1931.7	1204.4	1412.7	1585.9
415	1165.2	1174.5	1220.0	1771.0	1095.5	1288.5	1451.3
410	1059.2	1068.4	1110.8	1620.6	994.12	1172.6	1325.3
405	960.47	969.59	1009.0	1479.9	899.85	1064.6	1207.6
400	868.75	877.71	914.25	1348.6	812.38	964.23	1097.8
395	783.71	792.44	826.28	1226.0	731.39	871.01	995.59
390	705.01	713.47	744.75	1112.0	656.56	784.65	900.54
385	632.35	640.50	669.35	1005.9	587.59	704.83	812.37
380	565.43	573.22	599.78	907.59	524.19	631.21	730.75
375	503.95	511.36	535.75	816.54	466.04	563.48	655.36
370	447.62	454.63	476.96	732.42	412.88	501.34	585.91
365	396.16	402.75	423.15	654.91	364.42	444.49	522.09
360	349.29	355.45	374.03	583.66	320.38	392.62	463.61
355	306.74	312.46	329.33	518.34	280.51	345.46	410.17
350	268.25	273.53	288.80	458.63	244.53	302.72	361.50
345	233.56	238.41	252.17	404.22	212.19	264.13	317.31
340	202.41	206.83	219.20	354.81	183.24	229.41	277.34
335	174.55	178.56	189.63	310.09	157.43	198.30	241.31
330	149.76	153.37	163.23	269.76	134.54	170.54	208.97
325	127.78	131.02	139.77	233.55	114.33	145.89	180.06

TABLE 6 continued
 VAPOUR PRESSURE of PENTADIENES continued

Units: kPa v. K

No.	4	5	6	7	8	9	10
continued							
T K	p kPa						
320	108.41	111.28	119.01	201.17	96.573	124.10	154.32
315	91.411	93.953	100.74	172.34	81.063	104.94	131.53
310	76.586	78.815	84.739	146.81	67.591	88.182	111.45
305	63.731	65.671	70.814	124.30	55.963	73.609	93.842
300	52.652	54.329	58.766	104.57	45.991	61.013	78.496
295	43.169	44.607	48.408	87.379	37.499	50.198	65.201
290	35.109	36.332	39.566	72.488	30.320	40.975	53.758
285	28.310	29.341	32.071	59.678	24.300	33.167	43.975
280	22.621	23.482	25.768	48.734	19.292	26.610	35.673
275	17.901	18.614	20.511	39.455	15.164	21.149	28.682
270	14.021	14.605	16.164	31.650	11.794	16.640	22.844
265	10.862	11.336	12.605	25.142	9.0695	12.954	18.012
260	8.3170	8.6977	9.7190	19.766	6.8911	9.9697	14.051
255	6.2896	6.5916	7.4043	15.367	5.1693	7.5805	10.836
250	4.6936	4.9302	5.5689	11.806	3.8250	5.6897	8.2553
245	3.4531	3.6361	4.1314	8.9554	2.7893	4.2118	6.2076
240	2.5021	2.6417	3.0203	6.7014	2.0025	3.0719	4.6030
235	1.7837	1.8886	2.1737	4.9422	1.4138	2.2053	3.3624
230	1.2496	1.3271	1.5382	3.5882	9.80E-1	1.5564	2.4170
225	8.59E-1	9.15E-1	1.0690	2.5618	6.67E-1	1.0786	1.7076
220	5.79E-1	6.19E-1	7.29E-1	1.7962	4.44E-1	7.33E-1	1.1843
215	3.82E-1	4.10E-1	4.86E-1	1.2351	2.90E-1	4.88E-1	8.05E-1
210	2.46E-1	2.65E-1	3.17E-1	8.32E-1	1.84E-1	3.17E-1	5.36E-1
205	1.54E-1	1.67E-1	2.02E-1	5.47E-1	1.14E-1	2.01E-1	3.48E-1
200	9.42E-2	1.03E-1	1.25E-1	3.52E-1	6.89E-2	1.24E-1	2.21E-1
195	5.59E-2	6.12E-2	7.56E-2	2.20E-1	4.03E-2	7.46E-2	1.36E-1
190	3.21E-2	3.54E-2	4.42E-2	1.34E-1	2.28E-2	4.34E-2	8.14E-2
185	1.78E-2	1.98E-2		7.86E-2	1.25E-2	2.44E-2	4.72E-2
180	9.49E-3	1.06E-2		4.47E-2	6.56E-3	1.32E-2	2.64E-2
175	4.86E-3	5.48E-3		2.45E-2	3.30E-3	6.88E-3	1.42E-2
170	2.37E-3	2.71E-3		1.29E-2	1.59E-3	3.42E-3	7.33E-3
165	1.10E-3	1.27E-3		6.47E-3	7.26E-4	1.62E-3	3.61E-3
160	4.86E-4	5.66E-4		3.10E-3	3.14E-4	7.29E-4	1.69E-3
155	2.01E-4	2.38E-4		1.40E-3	1.28E-4		7.48E-4
150	7.78E-5	9.34E-5		5.98E-4	4.85E-5		3.11E-4
145	2.80E-5	3.41E-5		2.38E-4			1.21E-4
140	9.25E-6	1.15E-5		8.82E-5			4.35E-5
135		3.54E-6		3.00E-5			1.44E-5
130				9.31E-6			4.31E-6
125				2.60E-6			
T _f	136	132	186	125	147	159	127

TABLE 7

VAPOUR PRESSURE of HEXADIENES and HEXATRIENES

Units: kPa v. K

11	Hexa-1,trans-3-diene	1,trans-3-Hexadiene
12	Hexa-1,trans-4-diene	1,trans-4-Hexadiene
13	Hexa-1,5-diene	1,5-Hexa-1,5-diene
14	Hexa-trans-2,trans-4-diene	trans-2,trans-4-Hexadiene
15	2,3-Dimethylbuta-1,3-diene	2,3-Dimethyl-1,3-butadiene
16	Hexa-1,cis-3,5-triene	1,cis-3,5-Hexatriene

No.	11	12	13	14	15	16
T (K)	520.15	510.15	501.15	536.15	525.15	540.15
p _c (kPa)	3533	3258	3033	3388	3754	3569
T K	p kPa					
540						3561.8
535				3335.2		3331.3
530				3115.9		3115.0
525				2909.9	3746.3	2910.9
520	3525.5			2715.7	3500.4	2718.1
515	3284.5			2532.3	3269.9	2535.8
510	3059.1	3251.0		2359.1	3052.5	2363.4
505	2847.2	3028.8		2195.5	2847.3	2200.3
500	2647.6	2820.9	2983.8	2040.9	2653.3	2046.1
495	2459.6	2625.5	2779.4	1894.9	2470.0	1900.4
490	2282.3	2441.3	2587.9	1757.1	2296.8	1762.7
485	2115.3	2267.8	2407.8	1627.0	2133.1	1632.8
480	1957.9	2104.2	2238.0	1504.5	1978.5	1510.2
475	1809.7	1950.0	2078.0	1389.0	1832.6	1394.6
470	1670.3	1804.7	1927.1	1280.3	1695.0	1285.9
465	1539.2	1667.8	1784.9	1178.2	1565.3	1183.6
460	1416.0	1539.0	1650.9	1082.2	1443.2	1087.5
455	1300.4	1417.9	1524.7	992.26	1328.3	997.31
450	1192.1	1304.0	1406.0	907.99	1220.4	912.83
445	1090.6	1197.2	1294.4	829.17	1119.2	833.79
440	995.81	1097.1	1189.5	755.58	1024.3	759.96
435	907.28	1003.4	1091.1	686.96	935.51	691.11
430	824.76	915.71	998.94	623.11	852.58	627.02
425	747.99	833.90	912.67	563.79	775.22	567.47
420	676.68	757.65	832.06	508.81	703.20	512.25
415	610.59	686.71	756.85	457.94	636.28	461.16
410	549.45	620.84	686.80	410.99	574.22	413.99
405	493.02	559.80	621.68	367.76	516.79	370.54
400	441.07	503.35	561.25	328.05	463.76	330.63
395	393.35	451.27	505.31	291.68	414.92	294.05
390	349.64	403.33	453.62	258.46	370.05	260.64
385	309.71	359.32	405.98	228.20	328.94	230.20
380	273.35	319.03	362.19	200.72	291.38	202.55
375	240.34	282.25	322.03	175.86	257.16	177.53
370	210.47	248.78	285.32	153.44	226.10	154.96
365	183.54	218.42	251.86	133.30	197.99	134.67
360	159.35	190.97	221.46	115.28	172.64	116.51
355	137.71	166.25	193.93	99.216	149.87	100.32
350	118.42	144.06	169.09	84.962	129.50	85.951

TABLE 7 continued

VAPOUR PRESSURE of HEXADIENES and HEXATRIENES continued

Units: kPa v. K

No.	11	12	13	14	15	16
continued						
T K	p kPa					
345	101.32	124.24	146.76	72.371	111.34	73.252
340	86.216	106.60	126.77	61.304	95.242	62.084
335	72.947	90.986	108.96	51.626	81.027	52.314
330	61.351	77.219	93.151	43.207	68.539	43.811
325	51.272	65.148	79.192	35.927	57.627	36.454
320	42.564	54.622	66.927	29.669	48.145	30.126
315	35.087	45.494	56.210	24.325	39.953	24.719
310	28.708	37.629	46.899	19.791	32.921	20.128
305	23.305	30.894	38.858	15.973	26.924	16.260
300	18.762	25.168	31.959	12.782	21.845	13.024
295	14.972	20.334	26.081	10.136	17.576	10.338
290	11.836	16.286	21.108	7.9615	14.017	8.1294
285	9.2654	12.923	16.934	6.1904	11.073	6.3284
280	7.1772	10.154	13.460	4.7618	8.6608	4.8742
275	5.4979	7.8958	10.593	3.6213	6.7026	3.7118
270	4.1620	6.0717	8.2497	2.7208	5.1290	2.7929
265	3.1112	4.6142	6.3532	2.0180	3.8781	2.0748
260	2.2947	3.4626	4.8347	1.4764	2.8951	1.5204
255	1.6684	2.5639	3.6328	1.0645	2.1321	1.0982
250	1.1947	1.8714	2.6929	7.56E-1	1.5476	7.81E-1
245	8.42E-1	1.3452	1.9674	5.27E-1	1.1061	5.46E-1
240	5.83E-1	9.51E-1	1.4153	3.62E-1	7.78E-1	3.76E-1
235	3.96E-1	6.61E-1	1.0014	2.43E-1	5.37E-1	2.53E-1
230	2.64E-1	4.51E-1	6.96E-1	1.60E-1	3.64E-1	1.67E-1
225	1.72E-1	3.01E-1	4.75E-1	1.03E-1	2.42E-1	1.08E-1
220	1.10E-1	1.97E-1	3.17E-1	6.52E-2	1.57E-1	6.84E-2
215	6.81E-2	1.26E-1	2.07E-1	4.01E-2	9.96E-2	4.22E-2
210	4.12E-2	7.85E-2	1.32E-1	2.39E-2	6.16E-2	2.53E-2
205	2.42E-2	4.76E-2	8.22E-2	1.39E-2	3.71E-2	1.47E-2
200	1.38E-2	2.80E-2	4.97E-2	7.81E-3	2.17E-2	8.32E-3
195	7.60E-3	1.60E-2	2.92E-2	4.25E-3		4.54E-3
190	4.04E-3	8.81E-3	1.66E-2	2.22E-3		2.39E-3
185	2.06E-3	4.68E-3	9.09E-3	1.12E-3		1.21E-3
180	1.01E-3	2.39E-3	4.80E-3	5.37E-4		5.83E-4
175	4.69E-4	1.16E-3	2.42E-3	2.46E-4		2.69E-4
170	2.08E-4	5.40E-4	1.17E-3	1.07E-4		1.18E-4
165	8.68E-5	2.38E-4	5.37E-4	4.39E-5		4.87E-5
160	3.41E-5	9.88E-5	2.33E-4	1.69E-5		1.89E-5
155	1.25E-5	3.85E-5	9.52E-5	6.09E-6		6.85E-6
150	4.26E-6	1.39E-5	3.63E-5	2.03E-6		2.30E-6
145	1.33E-6	4.67E-6	1.29E-5	6.19E-7		7.10E-7
140	3.79E-7	1.43E-6	4.19E-6	1.72E-7		2.00E-7
135	9.74E-8	3.98E-7	1.24E-6	4.30E-8		5.05E-8
T _f	—	—	132	—	197	—

TABLE 8
VAPOUR PRESSURE of C₂ to C₄ ALKYNES

Units: kPa v. K

17	Acetylene	Ethyne		
18	Propyne	Allylene		Methylacetylene
19	But-1-yne	1-Butyne		Ethylacetylene
20	But-2-yne	2-Butyne		Dimethylacetylene
No.	17	18	19	20
T _c (K)	308.32	402.39	443.15	473.15
p _c (kPa)	6139	5626	4947	4874
T				
K			p	
			kPa	
470				4649.9
465				4314.3
460				3999.8
455				3704.3
450				3426.6
445				3165.5
440			4703.5	2920.1
435			4340.1	2689.6
430			4001.1	2473.2
425			3684.1	2270.2
420			3387.4	2080.0
415			3109.8	1902.0
410			2850.0	1735.6
405			2607.3	1580.2
400		5398.8	2380.5	1435.5
395		4951.6	2168.9	1300.8
390		4536.4	1971.8	1175.8
385		4149.8	1788.4	1059.9
380		3789.8	1618.0	952.71
375		3454.5	1460.0	853.81
370		3142.3	1313.7	762.77
365		2852.0	1178.7	679.18
360		2582.3	1054.2	602.64
355		2332.2	939.79	532.77
350		2100.5	834.90	469.18
345		1886.3	739.00	411.50
340		1688.8	651.59	359.36
335		1506.9	572.17	312.41
330		1340.0	500.27	270.30
325		1187.1	435.41	232.69
320		1047.6	377.13	199.25
315		920.61	324.99	169.66
310		805.44	278.54	143.60
305	5703.5	701.37	237.37	120.78
300	5100.0	607.70	201.06	100.92
295	4549.9	523.76	169.20	83.724
290	4047.7	448.87	141.43	68.942
285	3589.3	382.38	117.35	56.321
280	3171.4	323.67	96.630	45.623
275	2791.1	272.12	78.913	36.626

TABLE 8 continued

VAPOUR PRESSURE of C_2 to C_4 ALKYNES continued

Units: kPa v. K

No.	17	18	19	20
continued				
T K	p kPa			
270	2446.0	227.13	63.883	29.125
265	2133.5	188.11	51.235	22.925
260	1851.7	154.52	40.684	17.851
255	1598.3	125.80	31.964	13.739
250	1371.5	101.47	24.829	10.445
245	1169.5	81.013	19.054	7.8364
240	990.37	63.985	14.432	
235	832.50	49.952	10.780	
230	694.22	38.511	7.9315	
225	573.92	29.294	5.7423	
220	470.03	21.962	4.0856	
215	381.05	16.210	2.8528	
210	305.52	11.763	1.9520	
205	242.04	8.3817	1.3067	
200	189.26	5.8549	8.54E-1	
195	145.89	4.0027	5.44E-1	
190		2.6730	3.37E-1	
185		1.7400	2.02E-1	
180		1.1015	1.18E-1	
175		6.76E-1	6.59E-2	
170		4.02E-1	3.55E-2	
165			1.83E-2	
160			8.97E-3	
155			4.18E-3	
150			1.83E-3	
T_f	192.35	170	147	241

TABLE 9

VAPOUR PRESSURE of PENTYNES and HEXYNES

Units: kPa v. K

21	Pent-1-yne			1-Pentyne		
22	Pent-2-yne			2-Pentyne		
23	3-Methylbut-1-yne			3-Methyl-1-butyne		
24	Hex-1-yne			1-Hexyne		
25	Hex-2-yne			2-Hexyne		
26	Hex-3-yne			3-Hexyne		Diethylacetylene
No.	21	22	23	24	25	26
T _c (K)	481.15	505.15	463.15	516.15	535.15	531.15
p _c (kPa)	4165	4165	4200	3625	3625	3625
T				p		
K				kPa		
535					3617.3	
530					3371.1	3566.3
525					3140.6	3322.6
520					2923.8	3094.1
515				3564.7	2719.6	2879.1
510				3314.3	2527.1	2676.6
505		4155.9		3079.9	2345.7	2485.8
500		3866.3		2859.8	2174.7	2305.9
495		3595.5		2652.8	2013.6	2136.5
490		3341.0		2458.0	1861.9	1976.9
485		3101.5		2274.8	1719.1	1826.6
480	4093.0	2876.0		2102.5	1584.9	1685.3
475	3794.6	2663.7		1940.5	1458.8	1552.5
470	3515.8	2463.8		1788.2	1340.4	1427.8
465	3254.5	2275.7		1645.4	1229.5	1310.8
460	3009.2	2098.8	4000.0	1511.3	1125.6	1201.3
455	2778.8	1932.6	3701.2	1385.8	1028.5	1098.7
450	2562.6	1776.5	3421.8	1268.3	937.86	1002.9
445	2359.6	1630.2	3160.0	1158.4	853.34	913.56
440	2169.3	1493.1	2914.6	1055.9	774.68	830.30
435	1990.9	1364.8	2684.4	960.38	701.61	752.88
430	1823.8	1245.0	2468.6	871.50	633.85	681.02
425	1667.6	1133.2	2266.4	788.94	571.14	614.45
420	1521.6	1029.0	2077.1	712.41	513.24	552.91
415	1385.4	932.24	1900.0	641.60	459.89	496.14
410	1258.6	842.41	1734.5	576.23	410.86	443.89
405	1140.6	759.22	1580.1	516.02	365.91	395.93
400	1031.1	682.34	1436.2	460.68	324.80	352.01
395	929.68	611.45	1302.3	409.97	287.33	311.91
390	835.87	546.24	1177.9	363.61	253.26	275.40
385	749.33	486.42	1062.6	321.36	222.38	242.27
380	669.68	431.68	955.94	282.96	194.50	212.29
375	596.56	381.75	857.44	248.19	169.41	185.26
370	529.61	336.33	766.71	216.80	146.91	160.98
365	468.48	295.15	683.35	188.57	126.82	139.25
360	412.84	257.95	606.96	163.28	108.94	119.89
355	362.37	224.46	537.16	140.71	93.118	102.71
350	316.73	194.43	473.57	120.65	79.168	87.529

TABLE 9 continued
 VAPOUR PRESSURE of PENTYNES and HEXYNES continued

Units: kPa v. K

No.	21	22	23	24	25	26
continued						
T K	p kPa					
345	275.61	167.60	415.82	102.91	66.932	74.184
340	238.72	143.75	363.57	87.298	56.255	62.511
335	205.76	122.64	316.46	73.622	46.989	52.354
330	176.42	104.04	274.15	61.708	38.993	43.566
325	150.45	87.744	236.32	51.387	32.135	36.009
320	127.56	73.536	202.63	42.501	26.292	29.551
315	107.49	61.223	172.77	34.899	21.347	24.069
310	89.995	50.618	146.45	28.439	17.192	19.448
305	74.835	41.541	123.36	22.988	13.727	15.583
300	61.780	33.827	103.22	18.424	10.862	12.375
295	50.613	27.319	85.771	14.633	8.5131	9.7355
290	41.129	21.870	70.739	11.512	6.6046	7.5828
285	33.135	17.347	57.882	8.9643	5.0691	5.8438
280	26.451	13.623	46.966	6.9059	3.8464	4.4534
275	20.911	10.588	37.769	5.2595	2.8834	3.3535
270	16.361	8.1374	30.086	3.9572	2.1338	2.4935
265	12.661	6.1804	23.724	2.9390	1.5576	1.8292
260	9.6825	4.6352	18.506	2.1528	1.1205	1.3227
255	7.3126	3.4297	14.271	1.5539	7.94E-1	9.42E-1
250	5.4493	2.5016	10.870	1.1041	5.53E-1	6.60E-1
245	4.0030	1.7967	8.1713	7.71E-1	3.78E-1	4.54E-1
240	2.8959	1.2695	6.0566	5.29E-1	2.54E-1	3.07E-1
235	2.0608	8.81E-1	4.4218	3.56E-1	1.67E-1	2.03E-1
230	1.4409	6.00E-1	3.1764	2.35E-1	1.08E-1	1.32E-1
225	9.89E-1	4.01E-1	2.2423	1.52E-1	6.77E-2	8.35E-2
220	6.65E-1	2.62E-1	1.5534	9.55E-2	4.15E-2	5.16E-2
215	4.37E-1	1.67E-1	1.0547	5.86E-2	2.48E-2	3.11E-2
210	2.81E-1	1.04E-1	7.01E-1	3.50E-2	1.44E-2	1.82E-2
205	1.76E-1	6.29E-2	4.55E-1	2.03E-2	8.08E-3	1.03E-2
200	1.07E-1	3.69E-2	2.87E-1	1.14E-2	4.39E-3	5.65E-3
195	6.32E-2	2.10E-2	1.77E-1	6.17E-3	2.30E-3	2.99E-3
190	3.62E-2	1.16E-2	1.06E-1	3.22E-3	1.16E-3	1.52E-3
185	2.00E-2	6.12E-3	6.10E-2	1.61E-3	5.56E-4	7.41E-4
180	1.06E-2	3.11E-3		7.72E-4		3.45E-4
175	5.40E-3	1.51E-3		3.52E-4		1.52E-4
170	2.62E-3	6.97E-4		1.52E-4		6.37E-5
165		3.05E-4		6.19E-5		
160				2.36E-5		
155				8.40E-6		
150				2.76E-6		
145				8.31E-7		
T _f	167	164	183	141	183	170