

Zephex[®] 152a Physical Properties

IUPAC:

1,1-difluoroethane

Other Names:

HFA-152a

DFE

Structure:

CH_3CHF_2

Solubility:

Most organic solvents

Appearance:

Colourless liquified gas with a slight ethereal odour

Global Warming Potential (IPCC 5th assessment report):

134 (100-year time horizon)

Property Tables

PROPERTY	VALUE	UNIT	CONDITION
Molecular Weight	66.05	g mol ⁻¹	
Boiling Point	-24.0	°C	1 atm
Melting Point	-117.0	°C	
Critical Temperature	113.3	°C	
Critical Pressure	45.168	bar	
Critical Density	368.0	kg m ⁻³	
Saturated Liquid Density	899.47	kg m ⁻³	25°C
Saturated Vapour Density	18.47	kg m ⁻³	25°C
Surface Tension	9.71	mN m ⁻¹	25°C
Liquid Dielectric Constant	12.51		25°C
Liquid Dielectric Strength	5.9	kV/0.1-inch gap	5 atm
Vapour Dipole Moment	2.26	Debye	
Liquid Dipole Moment	3.69	Debye	
Solubility of water in HFA-152a	0.22	% w/w	25°C
Solubility of HFA-152a in water	2.8	g L ⁻¹	25°C
Flammability in Air	3.7 - 18.0	% Vol	1 atm
Refractive Index of Liquid HFA-152a	1.24		
Closed Cup Flash Point	< -50.0	°C	
Saturated Vapour Pressure	4.95	Barg	25°C
Specific Gravity	0.95		4°C
Liquid Viscosity	0.16	cP	25°C

Temperature (°C)	Saturated Vapour Pressure (Barg)	Saturated Liquid Density (kg m ⁻³)	Saturated Vapour Density (kg m ⁻³)	Surface Tension (mN m ⁻¹)	Liquid Viscosity (cP)
-50	-0.74	1063.70	0.99	20.45	0.43
-49	-0.72	1061.70	1.05	20.30	0.42
-48	-0.71	1059.80	1.10	20.15	0.42
-47	-0.69	1057.80	1.16	20.00	0.41
-46	-0.67	1055.80	1.22	19.85	0.41
-45	-0.65	1053.80	1.29	19.70	0.40
-44	-0.63	1051.80	1.36	19.54	0.39
-43	-0.61	1049.80	1.43	19.39	0.39
-42	-0.59	1047.80	1.50	19.24	0.38
-41	-0.57	1045.80	1.57	19.09	0.38
-40	-0.54	1043.80	1.65	18.94	0.37
-39	-0.52	1041.80	1.73	18.79	0.37
-38	-0.49	1039.80	1.82	18.65	0.36
-37	-0.46	1037.80	1.90	18.50	0.36
-36	-0.44	1035.80	1.99	18.35	0.35
-35	-0.41	1033.70	2.09	18.20	0.35
-34	-0.38	1031.70	2.19	18.05	0.34
-33	-0.34	1029.70	2.29	17.90	0.34
-32	-0.31	1027.60	2.39	17.75	0.33
-31	-0.28	1025.60	2.50	17.61	0.33
-30	-0.24	1023.50	2.61	17.46	0.32
-29	-0.20	1021.50	2.73	17.31	0.32
-28	-0.17	1019.40	2.85	17.16	0.31
-27	-0.13	1017.40	2.98	17.02	0.31
-26	-0.09	1015.30	3.11	16.87	0.31
-25	-0.04	1013.20	3.24	16.72	0.30
-24	0.00	1011.10	3.38	16.58	0.30
-23	0.05	1009.00	3.52	16.43	0.29
-22	0.09	1006.90	3.67	16.28	0.29
-21	0.14	1004.80	3.82	16.14	0.29
-20	0.19	1002.70	3.98	15.99	0.28
-19	0.25	1000.60	4.14	15.85	0.28
-18	0.30	998.49	4.31	15.70	0.27
-17	0.36	996.36	4.48	15.56	0.27
-16	0.41	994.23	4.66	15.41	0.27
-15	0.47	992.09	4.84	15.27	0.26
-14	0.54	989.94	5.03	15.12	0.26
-13	0.60	987.79	5.23	14.98	0.26
-12	0.66	985.63	5.43	14.84	0.25
-11	0.73	983.46	5.64	14.69	0.25
-10	0.80	981.28	5.85	14.55	0.25
-9	0.87	979.10	6.07	14.41	0.24
-8	0.95	976.91	6.30	14.26	0.24
-7	1.02	974.72	6.53	14.12	0.24
-6	1.10	972.51	6.77	13.98	0.24
-5	1.18	970.30	7.02	13.84	0.23
-4	1.27	968.08	7.27	13.70	0.23
-3	1.35	965.85	7.53	13.56	0.23
-2	1.44	963.61	7.80	13.41	0.22
-1	1.53	961.37	8.08	13.27	0.22
0	1.63	959.11	8.36	13.13	0.22
1	1.72	956.85	8.65	12.99	0.22
2	1.82	954.58	8.95	12.85	0.21

Temperature (°C)	Saturated Vapour Pressure (Barg)	Saturated Liquid Density (kg m ⁻³)	Saturated Vapour Density (kg m ⁻³)	Surface Tension (mN m ⁻¹)	Liquid Viscosity (cP)
3	1.92	952.30	9.26	12.71	0.21
4	2.03	950.01	9.57	12.57	0.21
5	2.13	947.71	9.90	12.43	0.21
6	2.24	945.40	10.23	12.29	0.20
7	2.36	943.08	10.57	12.16	0.20
8	2.47	940.76	10.92	12.02	0.20
9	2.59	938.42	11.28	11.88	0.20
10	2.71	936.07	11.65	11.74	0.19
11	2.84	933.71	12.03	11.60	0.19
12	2.97	931.34	12.42	11.47	0.19
13	3.10	928.96	12.82	11.33	0.19
14	3.23	926.57	13.23	11.19	0.19
15	3.37	924.16	13.65	11.06	0.18
16	3.51	921.75	14.08	10.92	0.18
17	3.66	919.32	14.52	10.78	0.18
18	3.81	916.89	14.97	10.65	0.18
19	3.96	914.44	15.43	10.51	0.17
20	4.12	911.97	15.91	10.38	0.17
21	4.28	909.50	16.40	10.24	0.17
22	4.44	907.01	16.90	10.11	0.17
23	4.61	904.51	17.41	9.97	0.17
24	4.78	901.99	17.93	9.84	0.16
25	4.95	899.47	18.47	9.71	0.16
26	5.13	896.92	19.02	9.57	0.16
27	5.31	894.37	19.58	9.44	0.16
28	5.50	891.79	20.16	9.31	0.16
29	5.69	889.21	20.75	9.18	0.16
30	5.88	886.61	21.36	9.05	0.15
31	6.08	883.99	21.98	8.91	0.15
32	6.29	881.36	22.61	8.78	0.15
33	6.50	878.71	23.26	8.65	0.15
34	6.71	876.04	23.93	8.52	0.15
35	6.93	873.36	24.61	8.39	0.15
36	7.15	870.66	25.31	8.26	0.14
37	7.37	867.94	26.03	8.13	0.14
38	7.60	865.20	26.76	8.00	0.14
39	7.84	862.45	27.51	7.87	0.14
40	8.08	859.67	28.28	7.75	0.14
41	8.32	856.88	29.07	7.62	0.14
42	8.57	854.07	29.87	7.49	0.13
43	8.83	851.23	30.70	7.36	0.13
44	9.09	848.38	31.54	7.24	0.13
45	9.35	845.50	32.41	7.11	0.13
46	9.63	842.60	33.29	6.98	0.13
47	9.90	839.68	34.20	6.86	0.13
48	10.18	836.74	35.13	6.73	0.13
49	10.47	833.77	36.08	6.61	0.12
50	10.76	830.78	37.06	6.48	0.12
51	11.06	827.76	38.06	6.36	0.12
52	11.36	824.72	39.08	6.24	0.12
53	11.67	821.65	40.13	6.11	0.12
54	11.98	818.56	41.20	5.99	0.12
55	12.30	815.43	42.30	5.87	0.12

Temperature (°C)	Saturated Vapour Pressure (Barg)	Saturated Liquid Density (kg m ⁻³)	Saturated Vapour Density (kg m ⁻³)	Surface Tension (mN m ⁻¹)	Liquid Viscosity (cP)
56	12.63	812.28	43.43	5.75	0.11
57	12.96	809.10	44.58	5.63	0.11
58	13.30	805.89	45.77	5.51	0.11
59	13.64	802.65	46.98	5.38	0.11
60	13.99	799.37	48.22	5.26	0.11
61	14.35	796.06	49.50	5.15	0.11
62	14.71	792.72	50.81	5.03	0.11
63	15.08	789.34	52.15	4.91	0.10
64	15.46	785.93	53.52	4.79	0.10
65	15.84	782.48	54.93	4.67	0.10
66	16.23	778.99	56.38	4.55	0.10
67	16.62	775.46	57.87	4.44	0.10
68	17.03	771.89	59.39	4.32	0.10
69	17.43	768.27	60.96	4.21	0.10
70	17.85	764.61	62.57	4.09	0.10
71	18.27	760.91	64.22	3.98	0.09
72	18.70	757.15	65.92	3.86	0.09
73	19.14	753.35	67.67	3.75	0.09
74	19.59	749.50	69.46	3.64	0.09
75	20.04	745.59	71.31	3.53	0.09
76	20.50	741.62	73.21	3.42	0.09
77	20.96	737.60	75.17	3.30	0.09
78	21.44	733.52	77.19	3.19	0.09
79	21.92	729.37	79.26	3.08	0.09
80	22.41	725.15	81.40	2.98	0.08
81	22.91	720.87	83.61	2.87	0.08
82	23.41	716.51	85.89	2.76	0.08
83	23.93	712.07	88.24	2.65	0.08
84	24.45	707.56	90.67	2.55	0.08
85	24.98	702.96	93.19	2.44	0.08
86	25.52	698.26	95.79	2.34	0.08
87	26.07	693.47	98.48	2.24	0.08
88	26.63	688.58	101.27	2.13	0.07
89	27.19	683.59	104.17	2.03	0.07
90	27.77	678.47	107.17	1.93	0.07
91	28.35	673.23	110.30	1.83	0.07
92	28.94	667.86	113.55	1.73	0.07
93	29.54	662.35	116.95	1.63	0.07
94	30.16	656.69	120.49	1.54	0.07
95	30.78	650.85	124.19	1.44	0.07
96	31.41	644.83	128.07	1.34	0.07
97	32.05	638.62	132.15	1.25	0.06
98	32.70	632.18	136.44	1.16	0.06
99	33.36	625.50	140.96	1.07	0.06
100	34.04	618.54	145.75	0.98	0.06

Koura
Zephex®

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