

SY

中华人民共和国石油天然气行业标准

SY/ T 6042—94

液化石油气、稳定轻烃动态计量 计 算 方 法

1995-01-18 发布

1995-07-01 实施

中国石油天然气总公司 发 布

目 次

1 主题内容与适用范围	(1)
2 引用标准	(1)
3 技术要求	(1)
4 质量计算	(2)
附录 A 液态烃压缩系数(补充件)	(5)
附录 B 液态烃温度修正系数(补充件)	(33)

液化石油气、稳定轻烃动态计量 计 算 方 法

1 主题内容与适用范围

本标准规定了用体积量、密度值确定商品液化石油气和稳定轻烃质量的计算方法及技术要求。

被测介质的体积量用容积式流量计测量，密度值用在线密度计自动测量或用压力密度计手工测量。

采用在线密度计自动测量密度值，本标准的适用密度范围为 $350 \sim 700 \text{ kg/m}^3$ （在温度为 15°C 的条件下）；采用压力密度计手工测量密度值，本标准的适用密度范围为 $610 \sim 700 \text{ kg/m}^3$ （在温度为 15°C 的条件下）。

2 引用标准

GB 3836.1 爆炸性环境用防爆电气设备 通用要求

GB 6602 液化石油气蒸气压测定法（LPG 法）

SY 5317 原油管线自动取样法

SH 0233 液化石油气采样法

SH/T 0221 液化石油气密度或相对密度测量法（压力密度计法）

3 技术要求

3.1 计量器具的准确度（基本误差）

3.1.1 容积式流量计的准确度等级不应低于 0.3 级。

3.1.2 在线密度计的基本误差不应大于 $\pm 0.001 \text{ g/cm}^3$ ，压力密度计的分度值不应大于 0.001 g/cm^3 。

3.1.3 压力测量仪表的准确度等级不应低于 0.4 级。

3.1.4 温度测量仪表的分度值不应大于 0.1°C 。

3.2 流量测量

3.2.1 不能使用安装温度补偿器的容积式流量计测量流量。

3.2.2 容积式流量计的最小工作流量应大于流量计最大额定流量的 $1/3$ 。

3.3 压力测量

3.3.1 应在靠近流量计进口端的管道上测量流体的压力。

3.3.2 被测流体的压力应始终大于 P_m 。 P_m 按下式计算：

$$P_m = 1.25P_e + 2P_1 \quad \dots\dots\dots(1)$$

式中： P_m ——最小测量压力，kPa；

P_e ——被测流体的平衡蒸气压，kPa，按 GB 6602 方法测定；

P_1 ——测量流量为最大值时，被测流体通过流量计的压降，kPa。

3.4 温度测量

3.4.1 应在靠近流量计进口端的管道上测量流体的温度。

3.4.2 温度计套应逆液流方向与管道中心线成 45° 角安装。当管线通径小于 150mm 时, 温度计套插深 1/2 通径, 当管线通径大于 150mm 时, 插深应不小于 100mm。

3.5 密度测量

3.5.1 在线自动测量密度值

在线密度计的进出口应分别连接在过滤器或靠近流量计入口处的节流件的进出口端。

3.5.2 取样测量密度值

3.5.2.1 采用自动取样器取样或手工取样测量密度值, 取样位置可以在流量计的上游或下游。

3.5.2.2 应按 SH 0233 的有关规定取样。

3.5.2.3 用自动取样器取样, 取样器的安装、操作、安全注意事项及取样原则, 应符合 SY 5317 的有关规定。

3.5.2.4 用压力密度计测量密度值, 应执行 SH/T 0221。水浴恒温 $15 \pm 0.2^\circ\text{C}$ 。压力密度计内的压力应调节到被测流体的平衡蒸气压。

3.6 检定

3.6.1 流量计的检定

3.6.1.1 应用标准体积管在线检定流量计。检定周期 6 个月。

3.6.1.2 按照有关规程检定标准体积管时, 应计算标准体积管在 15°C 和 101.325kPa 压力下的标准体积。

3.6.1.3 计算流量计系数时, 应使用 15°C 和被测流体的平衡蒸气压为标准条件。

注: ①确定此标准条件的依据是 ISO4267—2, 即液化石油气、稳定轻烃在 15°C 时的蒸气压高于大气压。

②由于附录中的数据(取自 API MPMS)以 15°C 为基准温度, 本标准采用 15°C 为标准温度。

3.6.1.4 流量计维修后, 应重新进行检定。

3.6.2 其他测量仪表的检定

密度、温度和压力测量仪表, 都应按照有关检定规程进行周期检定。

3.7 流量计系数的使用

3.7.1 采用流量计配在线密度计确定质量流量时, 应采用流量计实际流量下的流量计系数。

3.7.2 采用流量计配压力密度计确定质量流量时, 应采用平均流量下的流量计系数。

3.8 安全

3.8.1 安装在计量间内的所有电气设备, 应符合 GB 3836.1 的有关规定。

3.8.2 拆卸、维护计量器具及其辅助设备时, 应采取适当的安全措施。

4 质量计算

4.1 基本公式

4.1.1 采用流量计配在线密度计确定质量流量, 按下式计算:

$$m = \sum V_i \cdot \rho_i \cdot MF \quad \dots\dots\dots(2)$$

式中: m ——通过流量计的液体的质量, t;

V_i ——流量计测量的体积, m^3 ;

ρ_i ——在线密度计测量的密度值, g/cm^3 ;

MF ——流量计系数。

注: 因为计量的质量是液体在平衡蒸气压下的质量, 不是在大气压下的质量, 不能进行空气浮力修正。

4.1.2 采用手工测密度值确定质量流量, 按下式计算:

$$m = V \cdot \rho \cdot C$$

$$= V \cdot \rho (MF \cdot C_{\text{tlm}} \cdot C_{\text{plm}}) \dots\dots\dots(3)$$

式中: m ——通过流量计的液体的质量, t;

V ——某一时间间隔内流量计测量的累积体积值, m^3 ;

ρ ——流体在 15°C 和平衡蒸气压下的密度, g/cm^3 ;

C ——综合修正系数, $C = MF \cdot C_{\text{tlm}} \cdot C_{\text{plm}}$;

MF ——流量计系数;

C_{tlm} ——流量计中的流体受温度影响的修正系数, 查附录B (补充件);

C_{plm} ——流量计中的流体受压力影响的修正系数, 查附录A (补充件)。

注: 因为计量的质量是液体在平衡蒸气压下的质量, 不是在大气压下的质量, 不能进行空气浮力修正。

4.2 数据处理

4.2.1 温度测量值读到 0.1°C , 平均温度值修约间隔为 0.25°C 。

4.2.2 压力测量值读到 20kPa 。

4.2.3 用在线密度计测量密度, 测量值读到 $0.0001\text{g}/\text{cm}^3$ 。用压力密度计测量密度, 测量值读到 $0.001\text{g}/\text{cm}^3$ 。

4.2.4 流量测量值读到 0.001m^3 。

4.2.5 按公式(3)计算通过流量计的流体质量时, 应先计算综合修正系数 C , 然后计算密度 ρ 与综合修正系数 C 之乘积, 最后计算质量 m 。中间计算结果, 修约到4位小数。最终计算结果修约到3位小数。

4.3 计算举例

某轻烃外输计量站采用手工测密度的计量方式进行稳定轻烃计量。稳定轻烃在 15°C 时的平衡蒸气压为 450kPa (表), 计算1号流量计构成的计量系统24h计量的稳定轻烃的质量。

各参数的测量值见表1。

表1

测量时间	流量 l/min	流量计读数 m^3	温度 $^\circ\text{C}$	压力 kPa (表)	15°C 时密度 g/cm^3
93.3.1,8:00	1480	1035.624	5.0	1660	0.650
93.3.2,8:00	1510	1756.864	5.6	1650	0.650

计算数据见表2。

表2

序号	计算量	符号	单位	数值	备注
1	流量计24h测量的累积体积	V	m^3	721,240	
2	平均温度	T	$^\circ\text{C}$	5.25	
3	平均压力	P	kPa	1655	
4	平均流量	Q	l/min	1495	
5	平均密度	ρ	g/cm^3	0.650	

续表 2

序号	计算量	符号	单位	数值	备注
6	流量计系数	MF		0.9978	
7	温度修正系数	C_{tm}		1.0141	查附录 B
8	压力修正系数	C_{plm}		1.0020	计算详见附录 A
9	综合修正系数	C		1.0139	$6 \times 7 \times 8$

24h 计量的轻烃的质量为:

$$\begin{aligned}
 m &= V \cdot \rho \cdot C \\
 &= 721.240 \times 0.650 \times 1.0139 \\
 &= 475.322t
 \end{aligned}$$

附 录 A
液态烃压缩系数
(补 充 件)

A1 计算公式

$$F = \frac{1}{A + (P - P_e)B} \quad \dots\dots\dots(A1)$$

式中: F ——液态烃压缩系数, 10^{-6}kPa^{-1} ;

A 、 B ——计算系数;

P ——流量计的工作压力(表), kPa ;

P_e ——被测介质在 15°C 时的平衡蒸气压(表), kPa 。

计算系数 A 、 B 值查(表 A1)或按下述公式计算:

$$\begin{aligned} A \cdot 10^{-5} = & -2.1465891D-6 * TR^2 + 1.5774390D-5 * TR^2 * G^2 \\ & -1.0502139D-5 * TR^2 * G^4 + 2.8324481D-7 * TR^3 * G^6 \\ & -0.95495939D0 + 7.2900662D-8 * TR^3 G^2 \\ & -2.7769343D-7 * TR^3 * G^4 + 0.03645838D0 * TR * G^2 \\ & -0.05110158D0 * TR * G + 0.00795529D0 * TR + \\ & 9.13114910D0 * G \quad \dots\dots\dots(A2) \end{aligned}$$

$$A = A * 6.894757D0 \quad \dots\dots\dots(A3)$$

$$\begin{aligned} B \cdot 10^{-5} = & -6.0357667D-10 * TR^2 + 2.2112678D-6 * TR * G^2 \\ & + 0.00088384D0 * G - 0.00204016D0 * G^2 \quad \dots\dots\dots(A4) \end{aligned}$$

式中: D ——双精度精确到 10^1 ;

$D0$ ——双精度精确到 10^0 ;

TR ——热力学温度, $^\circ\text{R}$;

G ——相对密度($60^\circ\text{F}/^\circ\text{F}$)。

A2 计算举例

已知稳定轻烃在 15°C 时的密度 $\rho = 0.650\text{g}/\text{cm}^3$, 温度 $t = 5.25^\circ\text{C}$, 压力 $P_m = 165.5\text{kPa}$ (表), 平衡蒸气压 $P_e = 450\text{kPa}$ (表), 求 F 值及 C_{plm} 值。

查表 A2 得:

$$\begin{aligned} F &= 1.639 \times 10^{-6} \text{kPa}^{-1} \\ C_{\text{plm}} &= \frac{1}{1 - (P_m - P_e)F} \\ &= \frac{1}{1 - (1655 - 450) \times 1.639 \times 10^{-6}} \\ &= 1.0020 \end{aligned}$$

表 A1 液态烃压缩系数
(温度 -20~20℃, 15℃ 时密度 610~636 kg/m³)

$$F = \frac{1}{A + (P - P_c)B}$$

温度 ℃	15℃ 时密度, kg/m ³														
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	636
-20.00	A 670974	679466	688060	696759	705564	714477	723499	732633	741881	751243	760723	770323	780043	789887	809952
	B 3.110	3.036	2.961	2.886	2.809	2.732	2.654	2.575	2.496	2.415	2.334	2.252	2.169	2.085	1.915
-19.75	A 669267	677753	686341	695033	703832	712739	721756	730884	740126	749484	758959	768553	778269	788108	808166
	B 3.122	3.048	2.974	2.898	2.822	2.745	2.667	2.589	2.509	2.429	2.348	2.266	2.183	2.100	1.930
-19.50	A 667562	676041	684623	693310	702103	711004	720015	729137	738374	747726	757196	766786	776497	786332	806381
	B 3.134	3.060	2.986	2.911	2.835	2.758	2.681	2.602	2.523	2.443	2.362	2.280	2.198	2.115	1.946
-19.25	A 665859	674332	682907	691588	700375	709270	718275	727392	736624	745971	755435	765020	774726	784557	804597
	B 3.145	3.072	2.998	2.923	2.848	2.771	2.694	2.616	2.537	2.457	2.376	2.295	2.213	2.130	1.961
-19.00	A 664158	672624	681193	689858	698648	707538	716537	725649	734875	744217	753676	763256	772958	782784	802816
	B 3.157	3.084	3.010	2.936	2.860	2.784	2.707	2.629	2.550	2.471	2.391	2.309	2.227	2.144	1.976
-18.75	A 662459	670919	679481	688149	696924	705808	714801	723908	733128	742464	751919	761494	771191	781012	801036
	B 3.169	3.096	3.022	2.948	2.873	2.797	2.720	2.642	2.564	2.485	2.405	2.324	2.242	2.159	1.992
-18.50	A 660762	669215	677771	686433	695202	704070	713067	722168	731383	740714	750164	759734	769426	779243	799258
	B 3.180	3.108	3.035	2.961	2.886	2.810	2.733	2.656	2.578	2.499	2.419	2.338	2.257	2.174	2.007
-18.25	A 659066	667513	676063	684719	693481	702353	711335	720430	729640	738966	748410	757975	767663	777475	797482
	B 3.192	3.120	3.047	2.973	2.898	2.823	2.746	2.669	2.591	2.512	2.433	2.352	2.271	2.189	2.022
-18.00	A 657373	665813	674357	683006	691763	700628	709605	718694	727898	737219	746658	756219	765901	775709	795708
	B 3.204	3.132	3.059	2.985	2.911	2.835	2.759	2.683	2.605	2.526	2.447	2.367	2.286	2.204	2.038

续表 A1

温度 ℃	15℃时密度, kg/m ³														
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	636
-17.75	A 655681 B 3.215	664115 3.143	672652 3.071	681295 2.998	690046 2.923	698906 2.848	707876 2.772	716960 2.696	726159 2.618	735474 2.540	744908 2.461	754464 2.381	764142 2.300	773945 2.219	783875 2.136
-17.50	A 653991 B 3.227	662419 3.155	670950 3.083	679587 3.010	688331 2.936	697185 2.861	706150 2.785	715228 2.709	724421 2.632	733731 2.554	743160 2.475	752711 2.395	762384 2.315	772183 2.233	782109 2.151
-17.25	A 652304 B 3.238	660724 3.167	669249 3.095	677880 3.022	686618 2.948	695466 2.874	704425 2.798	713497 2.722	722685 2.645	731990 2.568	741414 2.489	750959 2.409	760628 2.329	770422 2.248	780334 2.166
-17.00	A 650618 B 3.250	659032 3.179	667550 3.107	676175 3.034	684907 2.961	693749 2.887	702702 2.811	711769 2.736	720951 2.659	730251 2.581	739670 2.503	749210 2.424	758874 2.344	768663 2.263	778581 2.181
-16.75	A 648934 B 3.261	657341 3.191	665853 3.119	674471 3.047	683198 2.973	692033 2.899	700981 2.824	710042 2.749	719219 2.672	728513 2.595	737927 2.517	747462 2.438	757121 2.358	766906 2.278	776819 2.196
-16.50	A 647252 B 3.273	655653 3.202	664158 3.131	672770 3.059	681490 2.986	690320 2.912	699262 2.837	708317 2.762	717488 2.686	726777 2.609	736186 2.531	745717 2.452	755371 2.373	765151 2.292	775060 2.211
-16.25	A 645572 B 3.284	653966 3.214	662465 3.143	671071 3.071	679785 2.998	688609 2.925	697544 2.850	706594 2.775	715760 2.699	725044 2.622	734447 2.545	743973 2.466	753622 2.387	763398 2.307	773302 2.226
-16.00	A 643893 B 3.296	652281 3.226	660774 3.155	669373 3.083	678081 3.010	686899 2.937	695829 2.863	704873 2.788	714033 2.712	723312 2.636	732710 2.558	742230 2.480	751875 2.401	761646 2.321	771546 2.241
-15.75	A 642217 B 3.307	650599 3.237	659085 3.167	667678 3.095	676379 3.023	685191 2.950	694115 2.876	703154 2.801	712308 2.726	721581 2.649	730975 2.572	740490 2.494	750130 2.416	759897 2.336	769792 2.256
-15.50	A 640543 B 3.318	648918 3.249	657397 3.178	665984 3.107	674679 3.035	683485 2.962	692404 2.889	701436 2.814	710585 2.739	719853 2.663	729241 2.586	738752 2.508	748387 2.430	758149 2.351	768040 2.270
-15.25	A 638870 B 3.330	647239 3.260	655712 3.190	664292 3.119	672981 3.047	681781 2.975	690694 2.902	699721 2.827	708864 2.752	718126 2.677	727509 2.600	737015 2.522	746645 2.444	756403 2.365	766289 2.285

续表 A1

温度 ℃	15℃时密度, kg / m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
-15.00	A 637200	645562	654028	662602	671285	680079	688986	698007	707145	716402	725779	735280	744906	754658	764541	774555
	B 3.341	3.272	3.202	3.131	3.060	2.987	2.914	2.840	2.766	2.690	2.614	2.536	2.458	2.380	2.300	2.220
-14.75	A 635531	643886	652347	660914	669591	678379	687280	696295	705428	714679	724051	733547	743168	752916	762794	772803
	B 3.352	3.283	3.214	3.143	3.072	3.000	2.927	2.853	2.779	2.704	2.627	2.550	2.473	2.394	2.315	2.235
-14.50	A 633865	642213	650667	659228	667899	676681	685575	694585	703712	712958	722325	731816	741432	751175	761049	771054
	B 3.364	3.295	3.226	3.155	3.084	3.012	2.940	2.866	2.792	2.717	2.641	2.564	2.487	2.409	2.329	2.250
-14.25	A 632200	640542	648989	657544	666208	674984	683873	692877	701998	711239	720601	730086	739697	749436	759305	769306
	B 3.375	3.306	3.237	3.167	3.096	3.025	2.952	2.879	2.805	2.730	2.655	2.578	2.501	2.423	2.344	2.265
-14.00	A 630537	638872	647313	655862	664520	673289	682172	691171	700286	709522	718878	728359	737965	747699	757564	767561
	B 3.386	3.318	3.249	3.179	3.109	3.037	2.965	2.892	2.818	2.744	2.668	2.592	2.515	2.437	2.359	2.279
-13.75	A 628876	637205	645639	654181	662833	671597	680474	689466	698576	707806	717158	726633	736234	745964	755824	765817
	B 3.397	3.329	3.261	3.191	3.121	3.050	2.978	2.905	2.832	2.757	2.682	2.606	2.529	2.452	2.374	2.294
-13.50	A 627218	635539	643967	652503	661148	669906	678777	687764	696868	706093	715439	724909	734506	744230	754086	764075
	B 3.408	3.341	3.272	3.203	3.133	3.062	2.990	2.918	2.845	2.771	2.696	2.620	2.544	2.466	2.388	2.309
-13.25	A 625561	633876	642297	650826	659466	668217	677082	686063	695162	704381	713722	723187	732779	742499	752350	762334
	B 3.419	3.352	3.284	3.215	3.145	3.074	3.003	2.931	2.858	2.784	2.709	2.634	2.558	2.481	2.403	2.324
-13.00	A 623906	632214	640629	649152	657785	666530	675389	684364	693457	702671	712007	721467	731053	740769	750616	760596
	B 3.431	3.363	3.295	3.227	3.157	3.087	3.016	2.944	2.871	2.797	2.723	2.648	2.572	2.495	2.417	2.339
-12.75	A 622252	630554	638962	647479	656106	664845	673698	682667	691755	700963	710293	719748	729330	739041	748883	758859
	B 3.442	3.375	3.307	3.239	3.169	3.099	3.028	2.956	2.884	2.811	2.736	2.661	2.586	2.509	2.432	2.354
-12.50	A 620601	628896	637298	645808	654428	663161	672009	680972	690054	699257	708582	718032	727609	737315	747152	757124
	B 3.453	3.386	3.319	3.250	3.181	3.111	3.041	2.969	2.897	2.824	2.750	2.675	2.600	2.523	2.446	2.368

续表 A1

温度 ℃	15℃时密度, kg/m ³														
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	636
-12.25	A 618952	627240	635635	644139	652753	661480	670321	679279	688355	697552	706872	716317	725889	735590	745424
	B 3.464	3.397	3.330	3.262	3.193	3.124	3.053	2.982	2.910	2.837	2.763	2.689	2.614	2.538	2.461
-12.00	A 617305	625586	633975	642472	651080	659800	668636	677588	686658	695850	705164	714604	724171	733868	743696
	B 3.475	3.409	3.342	3.274	3.205	3.136	3.066	2.995	2.923	2.850	2.777	2.703	2.628	2.552	2.475
-11.75	A 615659	623934	632316	640807	649408	658123	666952	675898	684963	694149	703458	712893	722455	732147	741971
	B 3.486	3.420	3.353	3.286	3.217	3.148	3.078	3.007	2.936	2.863	2.790	2.716	2.642	2.566	2.490
-11.50	A 614016	622284	630659	639144	647739	656447	665270	674210	683270	692450	701754	711184	720741	730428	740248
	B 3.497	3.431	3.365	3.297	3.229	3.160	3.091	3.020	2.949	2.877	2.804	2.730	2.656	2.580	2.504
-11.25	A 612375	620636	629004	637482	646071	654773	663590	672525	681578	690753	700052	709476	719029	728711	738526
	B 3.508	3.442	3.376	3.309	3.241	3.172	3.103	3.033	2.962	2.890	2.817	2.744	2.669	2.594	2.519
-11.00	A 610735	618990	627351	635823	644405	653101	661912	670841	679889	689058	698352	707771	717318	726996	736806
	B 3.519	3.453	3.387	3.321	3.253	3.185	3.115	3.045	2.975	2.903	2.831	2.757	2.683	2.609	2.533
-10.75	A 609097	617345	625700	634165	642742	651431	660236	669159	678201	687365	696653	706067	715609	725282	735088
	B 3.530	3.465	3.399	3.332	3.265	3.197	3.128	3.058	2.987	2.916	2.844	2.771	2.697	2.623	2.547
-10.50	A 607462	615703	624051	632516	641080	649783	658562	667476	676515	685674	694856	704365	713902	723571	733372
	B 3.540	3.476	3.410	3.344	3.277	3.209	3.140	3.071	3.000	2.929	2.857	2.785	2.711	2.637	2.562
-10.25	A 605828	614062	622404	630856	639420	648097	656890	665801	674831	683984	693261	702665	712197	721861	731658
	B 3.551	3.487	3.421	3.355	3.288	3.221	3.152	3.083	3.013	2.942	2.871	2.798	2.725	2.651	2.576
-10.00	A 604196	612424	620759	629204	637761	646432	655219	664124	673149	682297	691568	700967	710494	720153	729945
	B 3.562	3.498	3.433	3.367	3.300	3.233	3.165	3.096	3.026	2.955	2.884	2.812	2.739	2.665	2.590
-9.75	A 602567	610787	619116	627555	636105	644770	653551	662450	671469	680611	689877	699271	708793	718447	728235
	B 3.573	3.509	3.444	3.378	3.312	3.245	3.177	3.108	3.039	2.968	2.897	2.825	2.752	2.679	2.604

续表 A1

温度 ℃	15℃时密度, kg / m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
-9.50	A 600939	609153	617474	625907	634451	643109	651884	660777	669791	678927	688188	697576	707093	716743	726526	736445
	B 3.584	3.520	3.455	3.390	3.324	3.257	3.189	3.121	3.051	2.981	2.910	2.839	2.766	2.693	2.619	2.544
-9.25	A 599313	607520	615835	624261	632799	641451	650219	659107	668114	677245	686501	695883	705396	715040	724819	734734
	B 3.594	3.531	3.467	3.401	3.336	3.269	3.201	3.133	3.064	2.994	2.923	2.852	2.780	2.707	2.633	2.558
-9.00	A 597689	605889	614198	622617	631148	639794	648557	657438	666440	675565	684815	694193	703700	713339	723113	733024
	B 3.605	3.542	3.478	3.413	3.347	3.281	3.214	3.145	3.077	3.007	2.937	2.865	2.793	2.721	2.647	2.573
-8.75	A 596067	604260	612562	620974	629500	638139	646896	655771	664767	673886	683131	692504	702006	711641	721410	731316
	B 3.616	3.553	3.489	3.424	3.359	3.293	3.226	3.158	3.089	3.020	2.950	2.879	2.807	2.735	2.661	2.587
-8.50	A 594447	602633	610928	619334	627853	636486	645237	654106	663096	672210	681449	690817	700314	709944	719708	729610
	B 3.626	3.564	3.500	3.436	3.371	3.305	3.238	3.170	3.102	3.033	2.963	2.892	2.821	2.748	2.675	2.602
-8.25	A 592829	601009	609297	617696	626208	634835	643579	652443	661427	670535	679769	689131	698624	708248	718008	727906
	B 3.637	3.575	3.511	3.447	3.382	3.316	3.250	3.183	3.115	3.046	2.976	2.906	2.834	2.762	2.689	2.616
-8.00	A 591213	599386	607667	616060	624565	633186	641924	650781	659760	668863	678091	687448	696935	706555	716311	726204
	B 3.648	3.585	3.522	3.458	3.394	3.328	3.262	3.195	3.127	3.059	2.989	2.919	2.848	2.776	2.704	2.630
-7.75	A 589599	597765	606039	614425	622925	631539	640271	649122	658095	667192	676415	685766	695248	704864	714614	724503
	B 3.658	3.596	3.533	3.470	3.405	3.340	3.274	3.207	3.140	3.071	3.002	2.932	2.861	2.790	2.718	2.645
-7.50	A 587987	596145	604414	612793	621286	629894	638619	647465	656432	665523	674741	684087	693564	703174	712920	722804
	B 3.669	3.607	3.544	3.481	3.417	3.352	3.286	3.220	3.152	3.084	3.015	2.945	2.875	2.804	2.732	2.659
-7.25	A 586377	594528	602790	611162	619649	628250	636970	645809	654770	663856	673068	682409	691881	701486	711228	721108
	B 3.680	3.618	3.556	3.492	3.428	3.364	3.298	3.232	3.165	3.097	3.028	2.959	2.888	2.817	2.746	2.673
-7.00	A 584768	592913	601168	609534	618013	626609	635322	644155	653111	662191	671397	680733	690200	699800	709537	719412
	B 3.690	3.629	3.567	3.504	3.440	3.375	3.310	3.244	3.177	3.110	3.041	2.972	2.902	2.831	2.760	2.687

续表 A1

温度 ℃	15℃时密度, kg / m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
-6.75	A 583162	591300	599548	607907	616380	624969	633676	642504	651453	660527	669728	679059	688520	698116	707848	717719
	B 3.701	3.639	3.578	3.515	3.451	3.387	3.322	3.256	3.190	3.122	3.054	2.985	2.915	2.845	2.774	2.702
-6.50	A 581558	589689	597930	606282	614749	623332	632033	640854	649797	658866	668062	677386	686843	696434	706161	716028
	B 3.711	3.650	3.588	3.526	3.463	3.399	3.334	3.268	3.202	3.135	3.067	2.998	2.929	2.859	2.788	2.716
-6.25	A 579956	588080	596314	604660	613120	621696	630391	639206	648144	657206	666396	675716	685168	694754	704476	714338
	B 3.721	3.661	3.599	3.537	3.474	3.410	3.346	3.281	3.215	3.148	3.080	3.012	2.942	2.872	2.801	2.730
-6.00	A 578355	586472	594699	603039	611492	620062	628751	637560	646492	655549	664733	674048	683494	693075	702793	712650
	B 3.732	3.672	3.610	3.548	3.486	3.422	3.358	3.293	3.227	3.160	3.093	3.025	2.956	2.886	2.815	2.744
-5.75	A 576757	584867	593087	601420	609867	618430	627112	635916	644842	653893	663072	672381	681822	691398	701111	710965
	B 3.742	3.682	3.621	3.560	3.497	3.434	3.370	3.305	3.239	3.173	3.106	3.038	2.969	2.900	2.829	2.758
-5.50	A 575161	583263	591477	599803	608243	616800	625476	634273	643193	652239	661412	670716	680152	689723	699432	709280
	B 3.753	3.693	3.632	3.571	3.508	3.445	3.382	3.317	3.252	3.185	3.119	3.051	2.982	2.913	2.843	2.772
-5.25	A 573566	581662	589869	598188	606622	615172	623842	632633	641547	650587	659755	669053	678484	688050	697754	707598
	B 3.763	3.703	3.643	3.582	3.520	3.457	3.393	3.329	3.264	3.198	3.131	3.064	2.996	2.927	2.857	2.786
-5.00	A 571974	580063	588262	596575	605002	613546	622210	630994	639903	648937	658099	667392	676818	686379	696078	705918
	B 3.773	3.714	3.654	3.593	3.531	3.468	3.405	3.341	3.276	3.211	3.144	3.077	3.009	2.940	2.871	2.800
-4.75	A 570383	578465	586658	594964	603384	611922	620579	629358	638260	647289	656445	665733	675154	684710	694404	704239
	B 3.784	3.725	3.665	3.604	3.542	3.480	3.417	3.353	3.288	3.223	3.157	3.090	3.022	2.954	2.884	2.814
-4.50	A 568795	576870	585055	593354	601768	610300	618951	627723	636620	645642	654793	664076	673491	683042	692732	702562
	B 3.794	3.735	3.675	3.615	3.554	3.492	3.429	3.365	3.301	3.236	3.170	3.103	3.035	2.967	2.898	2.828
-4.25	A 567208	575276	583455	591747	600155	608680	617324	626090	634981	643998	653143	662420	671830	681377	691062	700887
	B 3.804	3.746	3.686	3.626	3.565	3.503	3.440	3.377	3.313	3.248	3.182	3.116	3.049	2.981	2.912	2.842

温度 ℃	15℃时密度, kg / m ³																
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636	
-4.00	A	565624	573684	581856	590142	598543	607061	615699	624460	633344	642355	651495	660766	670172	679713	689393	699214
	B	3.814	3.756	3.697	3.637	3.576	3.514	3.452	3.389	3.325	3.260	3.195	3.129	3.062	2.994	2.926	2.856
-3.75	A	564041	572095	580260	588539	596933	605445	614077	622831	631709	640714	649849	659115	668515	678051	687726	697543
	B	3.825	3.766	3.707	3.648	3.587	3.526	3.464	3.401	3.337	3.273	3.208	3.142	3.075	3.008	2.939	2.870
-3.50	A	562461	570507	578665	586937	595325	603830	612456	621204	630076	639076	648204	657465	666860	676391	686061	695874
	B	3.835	3.777	3.718	3.659	3.598	3.537	3.475	3.413	3.349	3.285	3.220	3.155	3.088	3.021	2.953	2.884
-3.25	A	560882	568922	577073	585338	593719	602218	610837	619578	628445	637439	646562	655817	665206	674733	684398	694206
	B	3.845	3.787	3.729	3.670	3.609	3.549	3.487	3.425	3.362	3.298	3.233	3.167	3.101	3.034	2.966	2.898
-3.00	A	559305	567338	575482	583740	592114	600607	609220	617955	626816	635804	644921	654171	663555	673076	682737	692540
	B	3.855	3.798	3.739	3.680	3.621	3.560	3.499	3.437	3.374	3.310	3.246	3.180	3.114	3.048	2.980	2.912
-2.75	A	557731	565756	573893	582145	590512	598998	607605	616334	625189	634171	643282	652527	661906	671422	681078	690876
	B	3.865	3.808	3.750	3.691	3.632	3.571	3.510	3.448	3.386	3.322	3.258	3.193	3.127	3.061	2.994	2.926
-2.50	A	556158	564176	572307	580551	588912	597391	605991	614715	623563	632539	641646	650884	660258	669769	679420	689214
	B	3.875	3.818	3.761	3.702	3.643	3.583	3.522	3.460	3.398	3.335	3.271	3.206	3.140	3.074	3.007	2.939
-2.25	A	554588	562599	570722	578960	587314	595786	604380	613097	621940	630910	640011	649244	658612	668118	677765	687554
	B	3.885	3.829	3.771	3.713	3.654	3.594	3.533	3.472	3.410	3.347	3.283	3.219	3.153	3.087	3.021	2.953
-2.00	A	553019	561023	569139	577370	585717	594184	602771	611482	620318	629283	638377	647605	656968	666470	676111	685896
	B	3.895	3.839	3.782	3.724	3.665	3.605	3.545	3.484	3.422	3.359	3.296	3.231	3.166	3.101	3.034	2.967
-1.75	A	551452	559449	567558	575782	584123	592583	601164	609868	618698	627657	636746	645969	655326	664823	674459	684239
	B	3.096	3.849	3.792	3.734	3.676	3.616	3.556	3.495	3.434	3.371	3.308	3.244	3.179	3.114	3.048	2.981
-1.50	A	549888	557877	565979	574196	582530	590984	599558	608256	617081	626033	635117	644334	653686	663177	672809	682585
	B	3.915	3.859	3.803	3.745	3.687	3.628	3.568	3.507	3.446	3.384	3.321	3.257	3.192	3.127	3.061	2.994

温度 ℃	15℃时密度, kg / m ³																
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636	
-1.25	A	548325	556307	564403	572613	580940	589386	597955	606647	615465	624412	633489	642701	652048	661534	671161	680932
	B	3.925	3.870	3.813	3.756	3.698	3.639	3.579	3.519	3.458	3.396	3.333	3.270	3.205	3.140	3.075	3.008
-1.00	A	546764	554740	562828	571031	579351	587791	596353	605039	613851	622792	631864	641070	650412	659893	669515	679281
	B	3.935	3.880	3.824	3.766	3.709	3.650	3.591	3.530	3.470	3.408	3.345	3.282	3.218	3.153	3.088	3.022
-0.75	A	545206	553174	561255	569451	577765	586198	594753	603433	612239	621174	630240	639441	648777	658253	667870	677632
	B	3.945	3.890	3.834	3.777	3.719	3.661	3.602	3.542	3.481	3.420	3.358	3.295	3.231	3.167	3.101	3.035
-0.50	A	543649	551610	559684	567873	576180	584607	593156	601829	610629	619558	628619	637813	647145	656615	666228	675984
	B	3.955	3.900	3.844	3.788	3.730	3.672	3.613	3.554	3.493	3.432	3.370	3.307	3.244	3.180	3.115	3.049
-0.25	A	542094	550048	558115	566297	574597	583017	591560	600227	609021	617944	626999	636188	645514	654979	664587	674339
	B	3.965	3.910	3.855	3.798	3.741	3.683	3.625	3.565	3.505	3.444	3.382	3.320	3.257	3.193	3.128	3.062
0.00	A	540542	548488	556548	564723	573017	581430	589966	598627	607414	616332	625381	634564	643885	653345	662948	672696
	B	3.975	3.920	3.865	3.809	3.752	3.694	3.636	3.577	3.517	3.456	3.395	3.332	3.270	3.206	3.141	3.076
0.25	A	538991	546930	554983	563151	571438	579845	588374	597028	605810	614721	623765	632943	642258	651713	661311	671054
	B	3.985	3.930	3.875	3.819	3.763	3.705	3.647	3.588	3.529	3.468	3.407	3.345	3.282	3.219	3.155	3.090
0.50	A	537442	545374	553420	561581	569861	578261	586784	595432	604208	613113	622151	631323	640633	650083	659676	669414
	B	3.995	3.940	3.886	3.830	3.774	3.716	3.658	3.600	3.540	3.480	3.419	3.358	3.295	3.232	3.168	3.103
0.75	A	535896	543820	551859	560013	568286	576680	585196	593838	602607	611506	620538	629705	639010	648455	658043	667776
	B	4.004	3.950	3.896	3.840	3.784	3.727	3.670	3.611	3.552	3.492	3.431	3.370	3.308	3.245	3.181	3.117
1.00	A	534351	542268	550300	558447	566713	575100	583610	592245	601008	609902	618928	628089	637389	646828	656411	666140
	B	4.014	3.960	3.906	3.851	3.795	3.738	3.681	3.623	3.564	3.504	3.444	3.382	3.320	3.258	3.194	3.130
1.25	A	532808	540718	548743	556883	565142	573523	582026	590655	599412	608299	617319	626475	635769	645204	654782	664506
	B	4.024	3.970	3.916	3.861	3.806	3.749	3.692	3.634	3.575	3.516	3.456	3.395	3.333	3.271	3.207	3.143

续表 A1

温度 ℃	15℃时密度, kg / m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
1.50	A 531268	539171	547188	555321	563573	571947	580444	589066	597817	606698	615713	624863	634152	643581	653154	662873
	B 4.033	3.980	3.926	3.872	3.816	3.760	3.703	3.646	3.587	3.528	3.468	3.407	3.346	3.284	3.221	3.157
1.75	A 529729	537625	545634	553761	562006	570373	578863	587480	596224	605100	614108	623253	632536	641960	651528	661243
	B 4.043	3.990	3.937	3.882	3.827	3.771	3.714	3.657	3.599	3.540	3.480	3.420	3.358	3.296	3.234	3.170
2.00	A 528193	536081	544083	552203	560441	568801	577285	585895	594633	603503	612506	621645	630922	640341	649904	659614
	B 4.053	4.000	3.947	3.893	3.838	3.782	3.726	3.668	3.610	3.552	3.492	3.432	3.371	3.309	3.247	3.184
2.25	A 526658	534539	542534	550647	558878	567232	575709	584312	593044	601908	610905	620038	629310	638724	648282	657987
	B 4.062	4.010	3.957	3.903	3.848	3.793	3.737	3.680	3.622	3.563	3.504	3.444	3.384	3.322	3.260	3.197
2.50	A 525125	532999	540987	549092	557317	565664	574134	582731	591457	600315	609306	618434	627700	637109	646662	656362
	B 4.072	4.020	3.967	3.913	3.859	3.804	3.748	3.691	3.634	3.575	3.516	3.457	3.396	3.335	3.273	3.210
2.75	A 523595	531461	539442	547540	555758	564098	572562	581153	589872	598723	607709	616831	626092	635496	645044	654739
	B 4.082	4.030	3.977	3.924	3.869	3.814	3.759	3.702	3.645	3.587	3.528	3.469	3.409	3.348	3.286	3.223
3.00	A 522066	529925	537899	545990	554201	562534	570991	579576	588289	597134	606114	615230	624486	633884	643427	653118
	B 4.091	4.039	3.987	3.934	3.880	3.825	3.770	3.714	3.657	3.599	3.540	3.481	3.421	3.360	3.299	3.237
3.25	A 520540	528391	536358	544442	552646	560972	569423	578001	586708	595547	604521	613631	622882	632275	641813	651499
	B 4.101	4.049	3.997	3.944	3.890	3.836	3.781	3.725	3.668	3.611	3.552	3.493	3.434	3.373	3.312	3.250
3.50	A 519015	526859	534819	542896	551093	559412	567856	576428	585129	593962	602929	612034	621279	630667	640200	649881
	B 4.110	4.059	4.007	3.954	3.901	3.847	3.792	3.736	3.679	3.622	3.564	3.506	3.446	3.386	3.325	3.263
3.75	A 517493	525329	533281	541351	549541	557854	566292	574856	583551	592378	601340	610439	619679	629061	638589	648265
	B 4.120	4.069	4.017	3.965	3.911	3.857	3.803	3.747	3.691	3.634	3.576	3.518	3.459	3.399	3.338	3.276
4.00	A 515972	523801	531746	539809	547992	556298	564729	573287	581976	590797	599753	608846	618080	627457	636980	646652
	B 4.129	4.078	4.027	3.975	3.922	3.868	3.814	3.758	3.702	3.646	3.588	3.530	3.471	3.411	3.351	3.290

续表 A1

温度 ℃	15℃时密度, kg / m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
4.25	A 514454	522276	530213	538269	546445	554744	563168	571720	580402	589217	598167	607255	616484	625855	635373	645040
	B 4.139	4.088	4.037	3.985	3.932	3.879	3.824	3.769	3.714	3.657	3.600	3.542	3.483	3.424	3.364	3.303
4.50	A 512937	520752	528682	536730	544900	553192	561609	570155	578831	587639	596583	605666	614889	624255	633768	643430
	B 4.148	4.098	4.047	3.995	3.942	3.889	3.835	3.781	3.725	3.669	3.612	3.554	3.496	3.436	3.376	3.316
4.75	A 511423	519230	527153	535194	543356	551642	560053	568592	577261	586064	595002	604078	613296	622657	632165	641822
	B 4.157	4.107	4.057	4.005	3.953	3.900	3.846	3.792	3.736	3.680	3.624	3.566	3.508	3.449	3.389	3.329
5.00	A 509911	517710	525626	533660	541815	550094	558498	567030	575693	584490	593422	602493	611705	621061	630563	640215
	B 4.167	4.117	4.066	4.015	3.963	3.910	3.857	3.803	3.748	3.692	3.636	3.578	3.520	3.462	3.402	3.342
5.25	A 508400	516192	524100	532128	540276	548547	556945	565471	574128	582918	591844	600909	610116	619466	628964	638611
	B 4.176	4.127	4.076	4.025	3.973	3.921	3.868	3.814	3.759	3.704	3.647	3.590	3.533	3.474	3.415	3.355
5.50	A 506892	514676	522577	530597	538738	547003	555394	563913	572564	581348	590268	599328	608528	617874	627366	637009
	B 4.185	4.136	4.086	4.035	3.984	3.931	3.878	3.825	3.770	3.715	3.659	3.602	3.545	3.487	3.428	3.368
5.75	A 505386	513163	521056	529069	537203	545461	553845	562358	571002	579780	588694	597748	606943	616283	625770	635408
	B 4.195	4.146	4.096	4.045	3.994	3.942	3.889	3.836	3.782	3.727	3.671	3.614	3.557	3.499	3.440	3.381
6.00	A 503881	511651	519537	527543	535670	543921	552298	560804	569442	578214	587122	596170	605360	614694	624177	633809
	B 4.204	4.155	4.106	4.055	4.004	3.952	3.900	3.847	3.793	3.738	3.682	3.626	3.569	3.512	3.453	3.394
6.25	A 502379	510141	518020	526018	534138	542382	550753	559253	567884	576650	585552	594594	603778	613107	622585	632212
	B 4.213	4.165	4.115	4.065	4.014	3.963	3.911	3.858	3.804	3.749	3.694	3.638	3.581	3.524	3.466	3.407
6.50	A 500879	508633	516505	524496	532609	540846	549210	557703	566328	575087	583984	593020	602199	611523	620994	630617
	B 4.222	4.174	4.125	4.075	4.025	3.973	3.921	3.869	3.815	3.761	3.706	3.650	3.594	3.536	3.478	3.420
6.75	A 499381	507128	514992	522976	531081	539312	547669	556155	564774	573527	582418	591448	600621	609939	619406	629024
	B 4.231	4.183	4.135	4.085	4.035	3.984	3.932	3.879	3.826	3.772	3.717	3.662	3.606	3.549	3.491	3.433

续表 A1

温度 ℃	15℃时密度, kg/m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
7.00	A 497885	505624	513481	521457	529556	537779	546130	554610	563222	571969	580853	589878	599045	608358	617820	627433
	B 4.241	4.193	4.144	4.095	4.045	3.994	3.943	3.890	3.837	3.784	3.729	3.674	3.618	3.561	3.504	3.446
7.25	A 496391	504122	511972	519941	528033	536249	544593	553066	561672	570412	579291	588310	597471	606779	616236	625844
	B 4.250	4.202	4.154	4.105	4.055	4.004	3.953	3.901	3.848	3.795	3.741	3.686	3.630	3.574	3.516	3.458
7.50	A 494899	502623	510465	518427	526511	534721	543057	551524	560124	568858	577730	586743	595899	605202	614653	624256
	B 4.259	4.212	4.163	4.115	4.065	4.015	3.964	3.912	3.859	3.806	3.752	3.698	3.642	3.586	3.529	3.471
7.75	A 493409	501125	508960	516914	524992	533194	541524	549984	558577	567306	576172	585179	594329	603626	613072	622671
	B 4.268	4.221	4.173	4.124	4.075	4.025	3.974	3.923	3.871	3.818	3.764	3.709	3.654	3.598	3.541	3.484
8.00	A 491921	499630	507457	515404	523474	531670	539993	548447	557033	565755	574615	583616	592761	602053	611494	621087
	B 4.277	4.230	4.183	4.134	4.085	4.035	3.985	3.934	3.882	3.829	3.775	3.721	3.666	3.610	3.554	3.497
8.25	A 490435	498136	505956	513896	521959	530147	538464	546911	555491	564206	573060	582056	591195	600481	609917	619505
	B 4.286	4.239	4.192	4.144	4.095	4.046	3.995	3.944	3.893	3.840	3.787	3.733	3.678	3.623	3.566	3.510
8.50	A 488951	496645	504457	512390	520445	528627	536936	545377	553950	562660	571508	580497	589631	598911	608342	617925
	B 4.295	4.249	4.202	4.154	4.105	4.056	4.006	3.955	3.904	3.851	3.798	3.745	3.690	3.635	3.579	3.522
8.75	A 487469	495155	502960	510885	518934	527108	535411	543845	552412	561115	569957	578940	588068	597344	606769	616347
	B 4.304	4.258	4.211	4.163	4.115	4.066	4.016	3.966	3.914	3.862	3.810	3.756	3.702	3.647	3.591	3.535
9.00	A 485989	493668	501465	509383	517425	525592	533888	542315	550875	559572	568408	577386	586508	595778	605198	614771
	B 4.313	4.267	4.221	4.173	4.125	4.076	4.027	3.976	3.925	3.874	3.821	3.768	3.714	3.659	3.604	3.548
9.25	A 484512	492182	499972	507883	515917	524077	532367	540787	549341	558031	566861	575833	584949	594214	603629	613197
	B 4.322	4.276	4.230	4.183	4.135	4.086	4.037	3.987	3.936	3.885	3.833	3.780	3.726	3.671	3.616	3.560
9.50	A 483036	490699	498481	506385	514412	522565	530847	539261	547808	556492	565316	574282	583393	592652	602061	611625
	B 4.331	4.286	4.239	4.192	4.145	4.097	4.047	3.998	3.947	3.896	3.844	3.791	3.738	3.683	3.629	3.573

续表 A1

温度 ℃	15℃时密度, kg / m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
9.75	A 481562	489218	496992	504888	512908	521055	529330	537737	546278	554956	563773	572733	581838	591092	600496	610054
	B 4.340	4.295	4.249	4.202	4.155	4.107	4.058	4.008	3.958	3.907	3.855	3.803	3.750	3.696	3.641	3.585
10.00	A 480091	487739	495506	503394	511407	519546	527814	536214	544749	553421	562232	571186	580285	589533	598932	608486
	B 4.349	4.304	4.258	4.212	4.165	4.117	4.068	4.019	3.969	3.918	3.867	3.814	3.761	3.708	3.653	3.598
10.25	A 478621	486261	494021	501902	509907	518040	526301	534694	543222	551888	560693	569641	578735	587977	597371	606919
	B 4.358	4.313	4.267	4.221	4.174	4.127	4.078	4.029	3.980	3.929	3.878	3.826	3.773	3.720	3.666	3.611
10.50	A 477154	484786	492538	500412	508410	516535	524790	533176	541698	550356	559156	568098	577186	586423	595811	605354
	B 4.366	4.322	4.277	4.231	4.184	4.137	4.089	4.040	3.990	3.940	3.889	3.837	3.785	3.732	3.678	3.623
10.75	A 475688	483313	491057	498924	506915	515033	523280	531660	540175	548827	557620	566556	575639	584870	594253	603792
	B 4.375	4.331	4.286	4.240	4.194	4.147	4.099	4.050	4.001	3.951	3.900	3.849	3.797	3.744	3.690	3.636
11.00	A 474225	481842	489579	497438	505421	513532	521773	530146	538654	547300	556087	565017	574094	583319	592697	602231
	B 4.384	4.340	4.295	4.250	4.204	4.157	4.109	4.061	4.012	3.962	3.912	3.860	3.808	3.756	3.702	3.648
11.25	A 472764	480373	488102	495953	503930	512034	520267	528634	537135	545775	554556	563480	572551	581771	591144	600672
	B 4.393	4.349	4.304	4.259	4.213	4.167	4.119	4.071	4.023	3.973	3.923	3.872	3.820	3.768	3.714	3.661
11.50	A 471304	478906	486627	494471	502440	510537	518764	527123	535618	544252	553026	561944	571009	580224	589591	599115
	B 4.401	4.358	4.314	4.269	4.223	4.177	4.130	4.082	4.033	3.984	3.934	3.883	3.832	3.780	3.727	3.673
11.75	A 469847	477441	485155	492991	500953	509043	517262	525615	534104	542731	551499	560411	569470	578679	588041	597559
	B 4.410	4.367	4.323	4.278	4.233	4.187	4.140	4.092	4.044	3.995	3.945	3.895	3.843	3.791	3.739	3.685
12.00	A 468392	475978	483684	491513	499468	507550	515763	524109	532591	541211	549978	558879	567933	577136	586493	596006
	B 4.419	4.376	4.332	4.288	4.242	4.197	4.150	4.103	4.054	4.006	3.956	3.906	3.855	3.803	3.751	3.698
12.25	A 466939	474517	482216	490037	497984	506060	514265	522605	531080	539694	548450	557350	566397	575595	584947	594455
	B 4.427	4.385	4.341	4.297	4.252	4.206	4.160	4.113	4.065	4.017	3.967	3.917	3.867	3.815	3.763	3.710

续表 A1

温度 ℃	15℃时密度, kg/m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
12.50	A 465488	473058	480749	488563	496503	504571	512770	521102	529571	538179	546928	555822	564864	574056	583402	592905
	B 4.436	4.393	4.350	4.306	4.262	4.216	4.170	4.123	4.076	4.027	3.978	3.929	3.878	3.827	3.775	3.722
12.75	A 464039	471602	479285	487092	495024	503085	511276	519602	528064	536665	545408	554296	563332	572519	581860	591358
	B 4.445	4.402	4.359	4.316	4.271	4.226	4.180	4.134	4.086	4.038	3.989	3.940	3.890	3.839	3.787	3.735
13.00	A 462592	470147	477823	485622	493547	501600	509785	518104	526559	535154	543891	552773	561803	570984	580319	589812
	B 4.453	4.411	4.368	4.325	4.281	4.236	4.190	4.144	4.097	4.049	4.000	3.951	3.901	3.851	3.799	3.747
13.25	A 461147	468694	476362	484154	492071	500118	508296	516607	525056	533644	542375	551251	560275	569451	578781	588268
	B 4.462	4.420	4.377	4.334	4.290	4.246	4.200	4.154	4.107	4.060	4.011	3.962	3.913	3.862	3.811	3.759
13.50	A 459705	467244	474904	482688	490598	498637	506808	515113	523555	532137	540861	549731	558750	567919	577244	586726
	B 4.470	4.429	4.386	4.343	4.300	4.255	4.210	4.164	4.118	4.070	4.022	3.974	3.924	3.874	3.823	3.772
13.75	A 458264	465795	473448	481224	489127	497159	505323	513621	522056	530631	539349	548213	557226	566390	575709	585186
	B 4.479	4.437	4.395	4.353	4.309	4.265	4.220	4.175	4.128	4.081	4.033	3.985	3.936	3.886	3.835	3.784
14.00	A 456825	464349	471994	479762	487658	495683	503839	512130	520559	529128	537839	546697	555704	564863	574176	583648
	B 4.487	4.446	4.404	4.362	4.319	4.275	4.230	4.185	4.139	4.092	4.044	3.996	3.947	3.897	3.847	3.796
14.25	A 455389	462904	470541	478303	486191	494208	502358	510642	519064	527626	536331	545183	554184	563337	572645	582112
	B 4.496	4.455	4.413	4.371	4.328	4.284	4.240	4.195	4.149	4.102	4.055	4.007	3.959	3.909	3.859	3.808
14.50	A 453954	461462	469091	476845	484726	492736	500878	509156	517571	526126	534826	543671	552666	561813	571116	580578
	B 4.504	4.464	4.422	4.380	4.337	4.294	4.250	4.205	4.159	4.113	4.066	4.018	3.970	3.921	3.871	3.820
14.75	A 452522	460022	467643	475389	483263	491265	499401	507671	516080	524629	533322	542161	551150	560292	569589	579046
	B 4.512	4.472	4.431	4.389	4.347	4.304	4.260	4.215	4.170	4.124	4.077	4.029	3.981	3.932	3.883	3.832
15.00	A 451092	458584	466197	473936	481802	489797	497925	506189	514590	523133	531820	540653	549636	558772	568064	577515
	B 4.521	4.481	4.440	4.398	4.356	4.313	4.270	4.225	4.180	4.134	4.088	4.041	3.993	3.944	3.895	3.844

续表 A1

温度 ℃	15℃时密度, kg/m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
15.25	A 449664 B 4.529	457147 4.489	464753 4.449	472484 4.408	480343 4.366	488331 4.323	496452 4.279	504708 4.235	513103 4.190	521639 4.145	530319 4.099	539147 4.052	548124 4.004	557254 3.955	566541 3.906	575987 3.856
15.50	A 448237 B 4.538	455713 4.498	463312 4.458	471035 4.417	478886 4.375	486866 4.332	494980 4.289	503230 4.245	511618 4.201	520148 4.155	528821 4.109	537642 4.063	546614 4.015	555738 3.967	565020 3.918	574460 3.869
15.75	A 446813 B 4.546	454281 4.506	461872 4.466	469587 4.426	477431 4.384	485404 4.342	493511 4.299	501754 4.255	510135 4.211	518658 4.166	527325 4.120	536140 4.074	545106 4.026	554224 3.979	563500 3.930	572936 3.881
16.00	A 445391 B 4.554	452851 4.515	460434 4.475	468142 4.435	475978 4.393	483944 4.351	492044 4.309	500279 4.265	508654 4.221	517170 4.176	525831 4.131	534640 4.085	543599 4.038	552713 3.990	561983 3.942	571413 3.893
16.25	A 443972 B 4.562	451424 4.524	458998 4.484	466699 4.444	474527 4.403	482486 4.361	490578 4.318	498807 4.275	507175 4.231	515684 4.187	524339 4.142	533142 4.096	542095 4.049	551202 4.001	560467 3.953	569892 3.904
16.50	A 442554 B 4.571	449998 4.532	457565 4.493	465257 4.453	473078 4.412	481030 4.370	489115 4.328	497336 4.285	505697 4.242	514201 4.197	522849 4.152	531645 4.106	540593 4.060	549694 4.013	558954 3.965	568373 3.916
16.75	A 441138 B 4.579	448574 4.540	456133 4.501	463818 4.462	471631 4.421	479575 4.380	487653 4.338	495868 4.295	504222 4.252	512719 4.208	521361 4.163	530151 4.117	539092 4.071	548188 4.024	557442 3.977	566856 3.928
17.00	A 439724 B 4.587	447152 4.549	454704 4.510	462381 4.470	470186 4.430	478123 4.389	486194 4.347	494402 4.305	502749 4.262	511239 4.218	519874 4.174	528658 4.128	537594 4.082	546684 4.036	555932 3.988	565341 3.940
17.25	A 438313 B 4.595	445733 4.557	453276 4.519	460946 4.479	468744 4.439	476673 4.399	484737 4.357	492937 4.315	501278 4.272	509761 4.228	518390 4.184	527168 4.139	536097 4.093	545182 4.047	554424 4.000	563828 3.952
17.50	A 436903 B 4.603	444315 4.566	451851 4.527	459513 4.488	467303 4.448	475225 4.408	483281 4.367	491475 4.325	499809 4.282	508285 4.239	516908 4.195	525679 4.150	534603 4.105	543681 4.058	552919 4.012	562317 3.964
17.75	A 435496 B 4.611	442900 4.574	450428 4.536	458081 4.497	465864 4.457	473779 4.417	481828 4.376	490015 4.335	498341 4.292	506811 4.249	515427 4.205	524193 4.161	533110 4.116	542183 4.070	551415 4.023	560808 3.976

续表 A1

温度 ℃	15℃时密度, kg/m ³															
	606	608	610	612	614	616	618	620	622	624	626	628	630	632	634	636
18.00	A 434091	441487	449006	456652	464428	472335	480377	488556	496876	505339	513949	522708	531620	540687	549913	559301
	B 4.620	4.582	4.544	4.506	4.466	4.426	4.386	4.344	4.302	4.259	4.216	4.172	4.127	4.081	4.035	3.988
18.25	A 432688	440075	447587	455226	462993	470893	478928	487100	495413	503870	512473	521225	530131	539192	548413	557795
	B 4.628	4.591	4.553	4.515	4.476	4.436	4.395	4.354	4.312	4.270	4.226	4.182	4.138	4.092	4.046	3.999
18.50	A 431287	438666	446170	453801	461561	469453	477480	485646	493952	502402	510998	519745	528644	537700	546914	556292
	B 4.636	4.599	4.561	4.523	4.485	4.445	4.405	4.364	4.322	4.280	4.237	4.193	4.149	4.103	4.058	4.011
18.75	A 429888	437259	444755	452378	460130	468015	476035	484193	492493	500936	509526	518266	527159	536209	545418	554790
	B 4.644	4.607	4.570	4.532	4.494	4.454	4.414	4.374	4.332	4.290	4.247	4.204	4.160	4.115	4.069	4.023
19.00	A 428491	435854	443342	450957	458702	466579	474592	482743	491035	499472	508056	516789	525677	534720	543924	553291
	B 4.652	4.615	4.578	4.541	4.502	4.463	4.424	4.383	4.342	4.300	4.258	4.214	4.171	4.126	4.081	4.034
19.25	A 427096	434451	441931	449538	457276	465145	473151	481295	489580	498010	506587	515315	524196	533234	542432	551793
	B 4.660	4.624	4.587	4.549	4.511	4.473	4.433	4.393	4.352	4.310	4.268	4.225	4.181	4.137	4.092	4.046
19.50	A 425703	433051	440522	448122	455851	463714	471712	479849	488127	496550	505121	513842	522717	531749	540942	550298
	B 4.668	4.632	4.595	4.558	4.520	4.482	4.443	4.403	4.362	4.321	4.279	4.236	4.192	4.148	4.103	4.058
19.75	A 424313	431652	439116	446707	454429	462284	470275	478404	486676	495092	503656	512371	521240	530266	539453	548804
	B 4.675	4.640	4.604	4.567	4.529	4.491	4.452	4.412	4.372	4.331	4.289	4.246	4.203	4.159	4.115	4.069
20.00	A 422924	430255	437711	445295	453009	460856	468840	476962	485227	493636	502194	510902	519765	528786	537967	547312
	B 4.683	4.648	4.612	4.575	4.538	4.500	4.461	4.422	4.382	4.341	4.299	4.257	4.214	4.170	4.126	4.081

表 A2 液态烃压缩系数
(温度-20~20℃, 15℃时密度 638~700kg/m³)

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668
-20.00	1.360	1.344	1.328	1.312	1.297	1.282	1.268	1.253	1.239	1.225	1.212	1.198	1.186	1.173	1.160	1.148
-19.75	1.364	1.348	1.332	1.316	1.301	1.286	1.271	1.256	1.242	1.228	1.215	1.201	1.188	1.176	1.163	1.151
-19.50	1.368	1.351	1.335	1.319	1.304	1.289	1.274	1.260	1.245	1.231	1.218	1.204	1.191	1.178	1.166	1.154
-19.25	1.371	1.355	1.339	1.323	1.307	1.292	1.277	1.263	1.248	1.234	1.221	1.207	1.194	1.181	1.169	1.156
-19.00	1.375	1.358	1.342	1.326	1.311	1.295	1.280	1.266	1.252	1.238	1.224	1.210	1.197	1.184	1.172	1.159
-18.75	1.379	1.362	1.346	1.330	1.314	1.299	1.284	1.269	1.255	1.241	1.227	1.213	1.200	1.187	1.174	1.162
-18.50	1.382	1.365	1.349	1.333	1.317	1.302	1.287	1.272	1.258	1.244	1.230	1.216	1.203	1.190	1.177	1.165
-18.25	1.386	1.369	1.353	1.336	1.321	1.305	1.290	1.276	1.261	1.247	1.233	1.219	1.206	1.193	1.180	1.168
-18.00	1.389	1.373	1.356	1.340	1.324	1.309	1.294	1.279	1.264	1.250	1.236	1.222	1.209	1.196	1.183	1.170
-17.75	1.393	1.376	1.360	1.343	1.328	1.312	1.297	1.282	1.267	1.253	1.239	1.225	1.212	1.199	1.186	1.173
-17.50	1.397	1.380	1.363	1.347	1.331	1.315	1.300	1.285	1.271	1.256	1.242	1.228	1.215	1.202	1.189	1.176
-17.25	1.401	1.383	1.367	1.350	1.334	1.319	1.304	1.289	1.274	1.259	1.245	1.232	1.218	1.205	1.192	1.179
-17.00	1.404	1.387	1.370	1.354	1.338	1.322	1.307	1.292	1.277	1.263	1.248	1.235	1.221	1.208	1.195	1.182
-16.75	1.408	1.391	1.374	1.357	1.341	1.326	1.310	1.295	1.280	1.266	1.252	1.238	1.224	1.211	1.197	1.185
-16.50	1.412	1.394	1.378	1.361	1.345	1.329	1.314	1.298	1.283	1.269	1.255	1.241	1.227	1.214	1.200	1.188
-16.25	1.415	1.398	1.381	1.364	1.348	1.332	1.317	1.302	1.287	1.272	1.253	1.244	1.230	1.216	1.203	1.190
-16.00	1.419	1.402	1.385	1.368	1.352	1.336	1.320	1.305	1.290	1.275	1.281	1.247	1.233	1.219	1.206	1.193
-15.75	1.423	1.405	1.388	1.372	1.355	1.339	1.324	1.308	1.293	1.278	1.264	1.250	1.236	1.222	1.209	1.196
-15.50	1.427	1.409	1.392	1.375	1.359	1.343	1.327	1.312	1.296	1.282	1.267	1.253	1.239	1.225	1.212	1.199
-15.25	1.430	1.413	1.396	1.379	1.362	1.346	1.330	1.315	1.300	1.285	1.270	1.256	1.242	1.228	1.215	1.202
-15.00	1.434	1.416	1.399	1.382	1.366	1.350	1.334	1.318	1.303	1.288	1.274	1.259	1.245	1.231	1.218	1.205
-14.75	1.438	1.420	1.403	1.386	1.369	1.353	1.337	1.322	1.306	1.291	1.277	1.262	1.248	1.234	1.221	1.208
-14.50	1.442	1.424	1.407	1.389	1.373	1.357	1.341	1.325	1.310	1.295	1.280	1.265	1.251	1.237	1.224	1.211
-14.25	1.446	1.428	1.410	1.393	1.376	1.360	1.344	1.328	1.313	1.298	1.283	1.269	1.254	1.240	1.227	1.214
-14.00	1.449	1.431	1.414	1.397	1.380	1.363	1.347	1.322	1.316	1.301	1.286	1.272	1.257	1.244	1.230	1.217
-13.75	1.453	1.435	1.418	1.400	1.383	1.367	1.351	1.335	1.319	1.304	1.289	1.275	1.261	1.247	1.233	1.219
-13.50	1.457	1.439	1.421	1.404	1.387	1.370	1.354	1.338	1.323	1.308	1.293	1.278	1.264	1.250	1.236	1.222
-13.25	1.461	1.443	1.425	1.408	1.391	1.374	1.358	1.342	1.326	1.311	1.296	1.281	1.267	1.253	1.239	1.225
-13.00	1.465	1.447	1.429	1.411	1.394	1.378	1.361	1.345	1.329	1.314	1.299	1.284	1.270	1.256	1.242	1.228

续表 A2

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668
-12.75	1.469	1.450	1.432	1.415	1.398	1.381	1.365	1.349	1.333	1.317	1.302	1.287	1.273	1.259	1.245	1.231
-12.50	1.473	1.454	1.436	1.419	1.401	1.385	1.368	1.352	1.336	1.321	1.306	1.291	1.276	1.262	1.248	1.234
-12.25	1.476	1.458	1.440	1.422	1.405	1.388	1.372	1.355	1.339	1.324	1.309	1.294	1.279	1.265	1.251	1.237
-12.00	1.480	1.462	1.444	1.426	1.409	1.392	1.375	1.359	1.343	1.327	1.312	1.297	1.282	1.268	1.254	1.240
-11.75	1.484	1.466	1.447	1.430	1.412	1.395	1.379	1.362	1.346	1.331	1.315	1.300	1.286	1.271	1.257	1.243
-11.50	1.488	1.469	1.451	1.433	1.416	1.399	1.382	1.366	1.350	1.334	1.319	1.303	1.289	1.274	1.260	1.246
-11.25	1.492	1.473	1.455	1.437	1.420	1.402	1.386	1.369	1.353	1.337	1.322	1.307	1.292	1.277	1.263	1.249
-11.00	1.496	1.477	1.459	1.441	1.423	1.406	1.389	1.373	1.356	1.341	1.325	1.310	1.295	1.280	1.266	1.252
-10.75	1.500	1.481	1.463	1.445	1.427	1.410	1.393	1.376	1.360	1.344	1.328	1.313	1.298	1.284	1.269	1.255
-10.50	1.504	1.485	1.466	1.448	1.431	1.413	1.396	1.380	1.363	1.347	1.332	1.316	1.301	1.287	1.272	1.258
-10.25	1.508	1.489	1.470	1.452	1.434	1.417	1.400	1.383	1.367	1.351	1.335	1.320	1.305	1.290	1.275	1.261
-10.00	1.512	1.493	1.474	1.456	1.438	1.421	1.403	1.387	1.370	1.354	1.338	1.323	1.308	1.293	1.279	1.264
-9.75	1.516	1.497	1.478	1.460	1.442	1.424	1.407	1.390	1.374	1.357	1.342	1.326	1.311	1.296	1.282	1.267
-9.50	1.520	1.501	1.482	1.463	1.445	1.428	1.411	1.394	1.377	1.361	1.345	1.329	1.314	1.299	1.285	1.270
-9.25	1.524	1.505	1.486	1.467	1.449	1.431	1.414	1.397	1.381	1.364	1.348	1.383	1.318	1.303	1.288	1.274
-9.00	1.528	1.509	1.490	1.471	1.453	1.435	1.418	1.401	1.384	1.368	1.352	1.336	1.321	1.306	1.291	1.277
-8.75	1.532	1.512	1.493	1.475	1.457	1.439	1.421	1.404	1.387	1.371	1.355	1.339	1.324	1.309	1.294	1.280
-8.50	1.536	1.516	1.497	1.479	1.460	1.442	1.425	1.408	1.391	1.375	1.358	1.343	1.327	1.312	1.297	1.283
-8.25	1.540	1.520	1.501	1.482	1.464	1.446	1.429	1.411	1.394	1.378	1.362	1.346	1.331	1.315	1.300	1.286
-8.00	1.544	1.524	1.505	1.486	1.468	1.450	1.432	1.415	1.398	1.381	1.365	1.349	1.334	1.319	1.304	1.289
-7.75	1.548	1.528	1.509	1.490	1.472	1.454	1.436	1.419	1.402	1.385	1.369	1.353	1.337	1.322	1.307	1.292
-7.50	1.552	1.532	1.513	1.494	1.475	1.457	1.440	1.422	1.405	1.388	1.372	1.356	1.340	1.325	1.310	1.295
-7.25	1.556	1.536	1.517	1.498	1.479	1.461	1.443	1.426	1.409	1.392	1.375	1.359	1.344	1.328	1.313	1.298
-7.00	1.561	1.541	1.521	1.502	1.483	1.465	1.447	1.429	1.412	1.395	1.379	1.363	1.347	1.331	1.316	1.302
-6.75	1.565	1.545	1.525	1.506	1.487	1.469	1.451	1.433	1.416	1.399	1.382	1.366	1.350	1.335	1.320	1.305
-6.50	1.569	1.549	1.529	1.510	1.491	1.472	1.454	1.437	1.419	1.402	1.386	1.369	1.354	1.338	1.323	1.308
-6.25	1.573	1.553	1.533	1.514	1.495	1.476	1.458	1.440	1.423	1.406	1.389	1.373	1.357	1.341	1.326	1.311
-6.00	1.577	1.557	1.537	1.517	1.498	1.480	1.462	1.444	1.426	1.409	1.393	1.376	1.360	1.345	1.329	1.314
-5.75	1.581	1.561	1.541	1.521	1.502	1.484	1.465	1.448	1.430	1.413	1.396	1.380	1.364	1.348	1.332	1.317

续表 A2

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668
-5.50	1.585	1.565	1.545	1.525	1.506	1.487	1.469	1.451	1.434	1.416	1.400	1.383	1.367	1.351	1.336	1.320
-5.25	1.590	1.569	1.549	1.529	1.510	1.491	1.473	1.455	1.437	1.420	1.403	1.387	1.370	1.354	1.339	1.324
-5.00	1.594	1.573	1.553	1.533	1.514	1.495	1.477	1.459	1.441	1.423	1.407	1.390	1.374	1.358	1.342	1.327
-4.75	1.598	1.577	1.557	1.537	1.518	1.499	1.480	1.462	1.444	1.427	1.410	1.393	1.377	1.361	1.345	1.330
-4.50	1.602	1.581	1.561	1.541	1.522	1.503	1.484	1.466	1.448	1.431	1.414	1.387	1.380	1.364	1.349	1.333
-4.25	1.607	1.586	1.565	1.545	1.526	1.507	1.488	1.470	1.452	1.434	1.417	1.400	1.384	1.368	1.352	1.336
-4.00	1.611	1.590	1.569	1.549	1.530	1.511	1.492	1.473	1.455	1.438	1.421	1.404	1.387	1.371	1.355	1.340
-3.75	1.615	1.594	1.573	1.553	1.534	1.514	1.496	1.477	1.459	1.441	1.424	1.407	1.391	1.374	1.358	1.343
-3.50	1.619	1.598	1.578	1.557	1.538	1.518	1.499	1.481	1.463	1.445	1.428	1.411	1.394	1.378	1.362	1.346
-3.25	1.624	1.602	1.582	1.561	1.541	1.522	1.503	1.485	1.466	1.449	1.431	1.414	1.397	1.381	1.365	1.349
-3.00	1.628	1.607	1.586	1.565	1.545	1.526	1.507	1.488	1.470	1.452	1.435	1.418	1.401	1.384	1.368	1.353
-2.75	1.632	1.611	1.590	1.569	1.549	1.530	1.511	1.492	1.474	1.456	1.438	1.421	1.404	1.388	1.372	1.356
-2.50	1.636	1.615	1.594	1.573	1.553	1.534	1.515	1.496	1.477	1.460	1.442	1.425	1.408	1.391	1.375	1.359
-2.25	1.641	1.619	1.598	1.578	1.557	1.538	1.519	1.500	1.481	1.463	1.446	1.428	1.411	1.395	1.378	1.363
-2.00	1.645	1.624	1.602	1.582	1.561	1.542	1.522	1.504	1.485	1.467	1.449	1.432	1.415	1.398	1.382	1.366
-1.75	1.649	1.628	1.607	1.586	1.565	1.546	1.526	1.507	1.489	1.470	1.453	1.435	1.418	1.401	1.385	1.369
-1.50	1.654	1.632	1.611	1.590	1.570	1.550	1.530	1.511	1.492	1.474	1.456	1.439	1.422	1.405	1.388	1.372
-1.25	1.658	1.636	1.615	1.594	1.574	1.554	1.534	1.515	1.496	1.478	1.460	1.442	1.425	1.408	1.392	1.376
-1.00	1.663	1.641	1.619	1.598	1.578	1.558	1.538	1.519	1.500	1.482	1.464	1.446	1.429	1.412	1.395	1.379
-0.75	1.667	1.645	1.623	1.602	1.582	1.562	1.542	1.523	1.504	1.485	1.467	1.450	1.432	1.415	1.399	1.382
-0.50	1.671	1.649	1.628	1.606	1.586	1.566	1.546	1.527	1.508	1.489	1.471	1.453	1.436	1.419	1.402	1.386
-0.25	1.676	1.654	1.632	1.611	1.590	1.570	1.550	1.530	1.511	1.493	1.475	1.457	1.439	1.422	1.405	1.389
0.00	1.680	1.658	1.636	1.615	1.594	1.574	1.554	1.534	1.515	1.496	1.478	1.460	1.433	1.426	1.409	1.392
0.25	1.685	1.662	1.640	1.619	1.598	1.578	1.558	1.538	1.519	1.500	1.482	1.464	1.446	1.429	1.412	1.396
0.50	1.689	1.667	1.645	1.623	1.602	1.582	1.562	1.542	1.523	1.504	1.486	1.468	1.450	1.433	1.416	1.399
0.75	1.694	1.671	1.649	1.627	1.606	1.586	1.566	1.546	1.527	1.508	1.489	1.471	1.453	1.436	1.419	1.403
1.00	1.698	1.675	1.653	1.632	1.610	1.590	1.570	1.550	1.530	1.511	1.493	1.475	1.457	1.440	1.423	1.406
1.25	1.703	1.680	1.658	1.636	1.615	1.594	1.574	1.554	1.534	1.515	1.497	1.478	1.461	1.443	1.426	1.409
1.50	1.707	1.684	1.662	1.640	1.619	1.598	1.578	1.558	1.538	1.519	1.500	1.482	1.464	1.447	1.429	1.413

续表 A2

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668
1.75	1.712	1.689	1.666	1.644	1.623	1.602	1.582	1.562	1.542	1.523	1.504	1.486	1.468	1.450	1.433	1.416
2.00	1.716	1.693	1.671	1.649	1.627	1.606	1.586	1.566	1.546	1.527	1.508	1.489	1.471	1.454	1.436	1.420
2.25	1.721	1.698	1.675	1.653	1.631	1.610	1.590	1.570	1.550	1.530	1.512	1.493	1.475	1.457	1.440	1.423
2.50	1.725	1.702	1.679	1.657	1.636	1.614	1.594	1.574	1.554	1.534	1.515	1.497	1.479	1.461	1.443	1.426
2.75	1.730	1.706	1.684	1.661	1.640	1.619	1.598	1.578	1.558	1.538	1.519	1.501	1.482	1.464	1.447	1.430
3.00	1.734	1.711	1.688	1.666	1.644	1.623	1.602	1.582	1.562	1.542	1.523	1.504	1.486	1.468	1.450	1.433
3.25	1.739	1.715	1.693	1.670	1.648	1.627	1.606	1.586	1.565	1.546	1.527	1.508	1.490	1.472	1.454	1.437
3.50	1.743	1.720	1.697	1.674	1.653	1.631	1.610	1.590	1.569	1.550	1.531	1.512	1.493	1.475	1.458	1.440
3.75	1.748	1.724	1.701	1.679	1.657	1.635	1.614	1.594	1.573	1.554	1.534	1.515	1.497	1.479	1.461	1.444
4.00	1.753	1.729	1.706	1.683	1.661	1.639	1.618	1.598	1.577	1.557	1.538	1.519	1.501	1.482	1.465	1.447
4.25	1.757	1.734	1.710	1.688	1.665	1.644	1.622	1.602	1.581	1.561	1.542	1.523	1.504	1.486	1.468	1.451
4.50	1.762	1.738	1.715	1.692	1.670	1.648	1.627	1.606	1.585	1.565	1.546	1.527	1.508	1.490	1.472	1.454
4.75	1.767	1.743	1.719	1.696	1.674	1.652	1.631	1.610	1.589	1.569	1.550	1.530	1.512	1.493	1.475	1.458
5.00	1.771	1.747	1.724	1.701	1.678	1.656	1.635	1.614	1.593	1.573	1.554	1.534	1.515	1.497	1.479	1.461
5.25	1.776	1.752	1.728	1.705	1.683	1.661	1.639	1.618	1.597	1.577	1.557	1.538	1.519	1.501	1.482	1.465
5.50	1.781	1.756	1.733	1.710	1.687	1.665	1.643	1.622	1.601	1.581	1.561	1.542	1.523	1.504	1.486	1.468
5.75	1.785	1.761	1.737	1.714	1.691	1.669	1.647	1.626	1.605	1.585	1.565	1.546	1.527	1.508	1.490	1.472
6.00	1.790	1.766	1.742	1.718	1.696	1.673	1.652	1.630	1.609	1.589	1.569	1.549	1.530	1.512	1.493	1.475
6.25	1.795	1.770	1.746	1.723	1.700	1.678	1.656	1.634	1.613	1.593	1.573	1.553	1.534	1.515	1.497	1.479
6.50	1.800	1.775	1.751	1.727	1.704	1.682	1.660	1.639	1.617	1.597	1.577	1.557	1.538	1.519	1.501	1.483
6.75	1.804	1.780	1.755	1.732	1.709	1.686	1.664	1.643	1.622	1.601	1.581	1.561	1.542	1.523	1.504	1.486
7.00	1.809	1.784	1.760	1.736	1.713	1.691	1.668	1.647	1.626	1.605	1.585	1.565	1.545	1.526	1.508	1.490
7.25	1.814	1.798	1.765	1.741	1.718	1.695	1.673	1.651	1.630	1.609	1.589	1.569	1.549	1.530	1.512	1.493
7.50	1.819	1.794	1.769	1.745	1.722	1.699	1.677	1.655	1.634	1.613	1.593	1.573	1.553	1.534	1.515	1.497
7.75	1.823	1.798	1.774	1.750	1.726	1.704	1.681	1.659	1.638	1.617	1.597	1.577	1.557	1.538	1.519	1.501
8.00	1.828	1.803	1.779	1.754	1.731	1.708	1.686	1.664	1.642	1.621	1.601	1.580	1.561	1.541	1.523	1.504
8.25	1.833	1.808	1.783	1.759	1.735	1.712	1.690	1.668	1.646	1.625	1.605	1.584	1.565	1.545	1.526	1.508
8.50	1.838	1.813	1.788	1.764	1.740	1.717	1.694	1.672	1.650	1.629	1.609	1.588	1.568	1.549	1.530	1.511
8.75	1.843	1.817	1.792	1.768	1.744	1.721	1.698	1.676	1.654	1.633	1.613	1.592	1.572	1.553	1.534	1.515

续表 A2

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668
9.00	1.848	1.822	1.797	1.773	1.749	1.726	1.703	1.681	1.659	1.637	1.617	1.596	1.576	1.557	1.537	1.519
9.25	1.853	1.827	1.802	1.777	1.753	1.730	1.707	1.685	1.663	1.641	1.621	1.600	1.580	1.560	1.541	1.522
9.50	1.857	1.832	1.807	1.782	1.758	1.734	1.711	1.689	1.667	1.646	1.625	1.604	1.584	1.564	1.545	1.526
9.75	1.862	1.837	1.811	1.787	1.762	1.739	1.716	1.693	1.671	1.650	1.629	1.608	1.588	1.568	1.549	1.530
10.00	1.867	1.841	1.816	1.791	1.767	1.743	1.720	1.698	1.675	1.654	1.633	1.612	1.592	1.572	1.552	1.533
10.25	1.872	1.846	1.821	1.796	1.771	1.748	1.725	1.702	1.680	1.658	1.637	1.616	1.596	1.576	1.556	1.537
10.50	1.877	1.851	1.826	1.800	1.776	1.752	1.729	1.706	1.684	1.662	1.641	1.620	1.600	1.580	1.560	1.541
10.75	1.882	1.856	1.830	1.805	1.781	1.757	1.733	1.711	1.688	1.666	1.645	1.624	1.603	1.583	1.564	1.545
11.00	1.887	1.861	1.835	1.810	1.785	1.761	1.738	1.715	1.692	1.670	1.649	1.628	1.607	1.587	1.568	1.548
11.25	1.892	1.866	1.840	1.815	1.790	1.766	1.742	1.719	1.697	1.675	1.653	1.632	1.611	1.591	1.571	1.552
11.50	1.897	1.871	1.845	1.819	1.794	1.770	1.747	1.724	1.701	1.679	1.657	1.636	1.615	1.595	1.575	1.556
11.75	1.902	1.875	1.849	1.824	1.799	1.775	1.751	1.728	1.705	1.683	1.661	1.640	1.619	1.599	1.579	1.560
12.00	1.907	1.880	1.854	1.829	1.804	1.779	1.756	1.732	1.709	1.687	1.665	1.644	1.623	1.603	1.583	1.563
12.25	1.912	1.885	1.859	1.833	1.808	1.784	1.760	1.737	1.714	1.691	1.670	1.648	1.627	1.607	1.587	1.567
12.50	1.917	1.890	1.864	1.838	1.813	1.789	1.765	1.741	1.718	1.696	1.674	1.652	1.631	1.611	1.591	1.571
12.75	1.922	1.895	1.869	1.443	1.818	1.793	1.769	1.745	1.722	1.700	1.678	1.656	1.635	1.615	1.594	1.575
13.00	1.927	1.900	1.874	1.848	1.822	1.798	1.774	1.750	1.727	1.704	1.682	1.660	1.639	1.619	1.598	1.579
13.25	1.933	1.905	1.879	1.853	1.827	1.802	1.778	1.754	1.731	1.708	1.686	1.665	1.643	1.623	1.602	1.582
13.50	1.938	1.910	1.884	1.857	1.832	1.807	1.783	1.759	1.735	1.713	1.690	1.669	1.647	1.626	1.606	1.586
13.75	1.943	1.915	1.888	1.862	1.837	1.812	1.787	1.763	1.740	1.717	1.695	1.673	1.651	1.630	1.610	1.590
14.00	1.948	1.920	1.893	1.867	1.841	1.816	1.792	1.768	1.744	1.721	1.699	1.677	1.655	1.634	1.614	1.594
14.25	1.953	1.925	1.898	1.872	1.846	1.821	1.796	1.772	1.749	1.726	1.703	1.681	1.660	1.638	1.618	1.598
14.50	1.958	1.930	1.903	1.877	1.851	1.826	1.801	1.777	1.753	1.730	1.707	1.685	1.664	1.642	1.622	1.602
14.75	1.963	1.935	1.908	1.882	1.856	1.830	1.805	1.781	1.757	1.734	1.712	1.689	1.668	1.646	1.626	1.605
15.00	1.969	1.941	1.913	1.886	1.860	1.835	1.810	1.786	1.762	1.739	1.716	1.694	1.672	1.650	1.630	1.609
15.25	1.974	1.946	1.918	1.891	1.865	1.840	1.815	1.790	1.766	1.743	1.720	1.698	1.676	1.654	1.634	1.613
15.50	1.979	1.951	1.923	1.896	1.870	1.844	1.819	1.795	1.771	1.747	1.724	1.702	1.680	1.659	1.638	1.617
15.75	1.984	1.956	1.928	1.901	1.875	1.849	1.824	1.799	1.775	1.752	1.729	1.706	1.684	1.663	1.642	1.621
16.00	1.989	1.961	1.933	1.906	1.880	1.854	1.828	1.804	1.780	1.756	1.733	1.710	1.688	1.667	1.646	1.625

续表 A2

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	668
16.25	1.995	1.966	1.938	1.911	1.884	1.859	1.833	1.808	1.784	1.760	1.737	1.715	1.692	1.671	1.650	1.629
16.50	2.000	1.971	1.943	1.916	1.889	1.863	1.838	1.813	1.789	1.765	1.742	1.719	1.697	1.675	1.654	1.633
16.75	2.005	1.976	1.948	1.921	1.894	1.868	1.843	1.818	1.793	1.769	1.746	1.723	1.701	1.679	1.658	1.637
17.00	2.011	1.982	1.954	1.926	1.899	1.873	1.847	1.822	1.798	1.774	1.750	1.727	1.705	1.683	1.662	1.641
17.25	2.016	1.987	1.959	1.931	1.904	1.878	1.852	1.827	1.802	1.778	1.755	1.732	1.709	1.687	1.666	1.645
17.50	2.021	1.992	1.964	1.936	1.909	1.883	1.857	1.831	1.807	1.783	1.759	1.736	1.713	1.691	1.670	1.649
17.75	2.027	1.997	1.969	1.941	1.914	1.887	1.861	1.836	1.811	1.787	1.763	1.740	1.718	1.695	1.674	1.653
18.00	2.032	2.003	1.974	1.946	1.919	1.892	1.866	1.841	1.816	1.791	1.768	1.745	1.722	1.700	1.678	1.657
18.25	2.037	2.008	1.979	1.951	1.924	1.897	1.871	1.845	1.820	1.796	1.772	1.749	1.726	1.704	1.682	1.661
18.50	2.043	2.013	1.984	1.956	1.929	1.902	1.876	1.850	1.825	1.800	1.777	1.753	1.730	1.708	1.686	1.665
18.75	2.048	2.018	1.990	1.961	1.934	1.907	1.880	1.855	1.830	1.805	1.781	1.757	1.735	1.712	1.690	1.669
19.00	2.053	2.024	1.995	1.966	1.939	1.912	1.885	1.859	1.834	1.809	1.785	1.762	1.739	1.716	1.694	1.673
19.25	2.059	2.029	2.000	1.971	1.944	1.917	1.890	1.864	1.839	1.814	1.790	1.766	1.743	1.720	1.698	1.677
19.50	2.064	2.034	2.005	1.977	1.949	1.921	1.895	1.869	1.843	1.819	1.794	1.771	1.747	1.725	1.702	1.681
19.75	2.070	2.040	2.010	1.982	1.954	1.926	1.900	1.874	1.848	1.823	1.799	1.775	1.752	1.729	1.707	1.685
20.00	2.075	2.045	2.016	1.987	1.959	1.931	1.904	1.878	1.853	1.828	1.803	1.779	1.756	1.733	1.711	1.689

温度 ℃	15℃时密度, kg/m ³															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
-20.00	1.136	1.124	1.113	1.101	1.090	1.079	1.069	1.058	1.048	1.038	1.028	1.018	1.008	0.999	0.990	0.981
-19.75	1.139	1.127	1.115	1.104	1.093	1.082	1.071	1.061	1.050	1.040	1.030	1.020	1.011	1.001	0.992	0.983
-19.50	1.142	1.130	1.118	1.107	1.095	1.084	1.074	1.063	1.053	1.042	1.032	1.023	1.013	1.003	0.994	0.985
-19.25	1.144	1.132	1.121	1.109	1.098	1.087	1.076	1.065	1.055	1.045	1.035	1.025	1.015	1.006	0.996	0.987
-19.00	1.147	1.135	1.123	1.112	1.101	1.089	1.079	1.068	1.057	1.047	1.037	1.027	1.018	1.008	0.999	0.989
-18.75	1.150	1.138	1.126	1.114	1.103	1.092	1.081	1.070	1.060	1.050	1.040	1.030	1.020	1.010	1.001	0.992
-18.50	1.153	1.140	1.129	1.117	1.106	1.095	1.084	1.073	1.062	1.052	1.042	1.032	1.022	1.012	1.003	0.994
-18.25	1.155	1.143	1.131	1.120	1.108	1.097	1.086	1.075	1.065	1.054	1.044	1.034	1.024	1.015	1.005	0.996
-18.00	1.158	1.146	1.134	1.122	1.111	1.100	1.089	1.078	1.067	1.057	1.047	1.037	1.027	1.017	1.008	0.998
-17.75	1.161	1.149	1.137	1.125	1.114	1.102	1.091	1.080	1.070	1.059	1.049	1.039	1.029	1.019	1.010	1.000
-17.50	1.164	1.151	1.139	1.128	1.116	1.105	1.094	1.083	1.072	1.062	1.051	1.041	1.031	1.022	1.012	1.003

续表 A2

 10^{-6}kPa

温度 ℃	15℃时密度, kg/m^3															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
-17.25	1.166	1.154	1.142	1.130	1.119	1.107	1.096	1.085	1.075	1.064	1.054	1.044	1.034	1.024	1.014	1.005
-17.00	1.169	1.157	1.145	1.133	1.121	1.110	1.099	1.088	1.077	1.067	1.056	1.046	1.036	1.026	1.016	1.007
-16.75	1.172	1.160	1.148	1.136	1.124	1.113	1.101	1.090	1.080	1.069	1.058	1.048	1.038	1.028	1.019	1.009
-16.50	1.175	1.162	1.150	1.138	1.127	1.115	1.104	1.093	1.082	1.071	1.061	1.051	1.041	1.031	1.021	1.011
-16.25	1.178	1.165	1.153	1.141	1.129	1.118	1.106	1.095	1.084	1.074	1.063	1.053	1.043	1.033	1.023	1.014
-16.00	1.180	1.168	1.156	1.144	1.132	1.120	1.109	1.098	1.087	1.076	1.066	1.055	1.045	1.035	1.026	1.016
-15.75	1.183	1.171	1.158	1.146	1.135	1.123	1.112	1.100	1.089	1.079	1.068	1.058	1.048	1.038	1.028	1.018
-15.50	1.186	1.174	1.161	1.149	1.137	1.126	1.114	1.103	1.092	1.081	1.071	1.060	1.050	1.040	1.030	1.020
-15.25	1.189	1.176	1.164	1.152	1.140	1.128	1.117	1.105	1.094	1.084	1.073	1.063	1.052	1.042	1.032	1.023
-15.00	1.192	1.179	1.167	1.155	1.143	1.131	1.119	1.108	1.097	1.086	1.075	1.065	1.055	1.045	1.035	1.025
-14.75	1.195	1.182	1.170	1.157	1.145	1.133	1.122	1.111	1.099	1.089	1.078	1.067	1.057	1.047	1.037	1.027
-14.50	1.198	1.185	1.172	1.160	1.148	1.136	1.125	1.113	1.102	1.091	1.080	1.070	1.059	1.049	1.039	1.029
-14.25	1.200	1.188	1.175	1.163	1.151	1.139	1.127	1.116	1.105	1.094	1.083	1.072	1.062	1.052	1.042	1.032
-14.00	1.203	1.191	1.178	1.165	1.153	1.141	1.130	1.118	1.107	1.096	1.085	1.075	1.064	1.054	1.044	1.034
-13.75	1.206	1.193	1.181	1.168	1.156	1.144	1.132	1.121	1.110	1.099	1.088	1.077	1.066	1.056	1.046	1.036
-13.50	1.209	1.196	1.183	1.171	1.159	1.147	1.135	1.123	1.112	1.101	1.090	1.079	1.069	1.059	1.048	1.039
-13.25	1.212	1.199	1.186	1.174	1.162	1.149	1.138	1.126	1.115	1.104	1.093	1.082	1.071	1.061	1.051	1.041
-13.00	1.215	1.202	1.189	1.177	1.164	1.152	1.140	1.129	1.117	1.106	1.095	1.084	1.074	1.063	1.053	1.043
-12.75	1.218	1.205	1.192	1.179	1.167	1.155	1.143	1.131	1.120	1.109	1.098	1.087	1.076	1.066	1.055	1.045
-12.50	1.221	1.208	1.195	1.182	1.170	1.158	1.146	1.134	1.122	1.111	1.100	1.089	1.079	1.068	1.058	1.048
-12.25	1.224	1.211	1.198	1.185	1.172	1.160	1.148	1.136	1.125	1.114	1.103	1.092	1.081	1.070	1.060	1.050
-12.00	1.227	1.213	1.200	1.188	1.175	1.163	1.151	1.139	1.128	1.116	1.105	1.094	1.083	1.073	1.062	1.052
-11.75	1.230	1.216	1.203	1.190	1.178	1.166	1.154	1.142	1.130	1.119	1.108	1.097	1.086	1.075	1.065	1.055
-11.50	1.233	1.219	1.206	1.193	1.181	1.168	1.156	1.144	1.133	1.121	1.110	1.099	1.088	1.078	1.067	1.057
-11.25	1.236	1.222	1.209	1.196	1.183	1.171	1.159	1.147	1.135	1.124	1.113	1.102	1.091	1.080	1.070	1.059
-11.00	1.238	1.225	1.212	1.199	1.186	1.174	1.162	1.150	1.138	1.126	1.115	1.104	1.093	1.082	1.072	1.062
-10.75	1.241	1.228	1.215	1.202	1.189	1.177	1.164	1.152	1.141	1.129	1.118	1.107	1.096	1.085	1.074	1.064
-10.50	1.244	1.231	1.218	1.205	1.192	1.179	1.167	1.155	1.143	1.132	1.120	1.109	1.098	1.087	1.077	1.066
-10.25	1.247	1.234	1.220	1.207	1.195	1.182	1.170	1.158	1.146	1.134	1.123	1.111	1.100	1.090	1.079	1.069

续表 A2

 10^{-6}kPa

温度 ℃	15℃时密度, kg/m^3															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
-10.00	1.250	1.237	1.223	1.210	1.197	1.185	1.172	1.160	1.148	1.137	1.125	1.114	1.103	1.092	1.081	1.071
-9.75	1.253	1.240	1.226	1.213	1.200	1.188	1.175	1.163	1.151	1.139	1.128	1.117	1.105	1.095	1.084	1.073
-9.50	1.256	1.243	1.229	1.216	1.203	1.190	1.178	1.166	1.154	1.142	1.130	1.119	1.108	1.097	1.086	1.076
-9.25	1.259	1.246	1.232	1.219	1.206	1.193	1.181	1.168	1.156	1.145	1.133	1.122	1.110	1.099	1.089	1.078
-9.00	1.262	1.249	1.235	1.222	1.209	1.196	1.183	1.171	1.159	1.147	1.135	1.124	1.113	1.102	1.091	1.080
-8.75	1.266	1.252	1.238	1.225	1.212	1.199	1.186	1.174	1.162	1.150	1.138	1.127	1.115	1.104	1.094	1.083
-8.50	1.269	1.255	1.241	1.227	1.214	1.201	1.189	1.176	1.164	1.152	1.141	1.129	1.118	1.107	1.096	1.085
-8.25	1.272	1.258	1.244	1.230	1.217	1.204	1.192	1.179	1.167	1.155	1.143	1.132	1.120	1.109	1.098	1.088
-8.00	1.275	1.261	1.247	1.233	1.220	1.207	1.194	1.182	1.170	1.158	1.146	1.134	1.123	1.112	1.101	1.090
-7.75	1.278	1.264	1.250	1.236	1.223	1.210	1.197	1.185	1.172	1.160	1.148	1.137	1.125	1.114	1.103	1.092
-7.50	1.281	1.267	1.253	1.239	1.226	1.213	1.200	1.187	1.175	1.163	1.151	1.139	1.128	1.117	1.106	1.095
-7.25	1.284	1.270	1.256	1.242	1.229	1.216	1.203	1.190	1.178	1.166	1.154	1.142	1.130	1.119	1.108	1.097
-7.00	1.287	1.273	1.259	1.245	1.232	1.218	1.205	1.193	1.180	1.168	1.156	1.145	1.133	1.122	1.111	1.100
-6.75	1.290	1.276	1.262	1.248	1.234	1.221	1.208	1.196	1.183	1.171	1.159	1.147	1.135	1.124	1.113	1.102
-6.50	1.293	1.279	1.265	1.251	1.237	1.224	1.211	1.198	1.186	1.174	1.161	1.150	1.138	1.127	1.116	1.105
-6.25	1.296	1.282	1.268	1.254	1.240	1.227	1.214	1.201	1.188	1.176	1.164	1.152	1.141	1.129	1.118	1.107
-6.00	1.299	1.285	1.271	1.257	1.243	1.230	1.217	1.204	1.191	1.179	1.167	1.155	1.143	1.132	1.120	1.109
-5.75	1.302	1.288	1.274	1.260	1.246	1.233	1.220	1.207	1.194	1.182	1.169	1.157	1.146	1.134	1.123	1.112
-5.50	1.306	1.291	1.277	1.263	1.249	1.236	1.222	1.209	1.197	1.184	1.172	1.160	1.148	1.137	1.125	1.114
-5.25	1.309	1.294	1.280	1.266	1.252	1.238	1.225	1.212	1.199	1.187	1.175	1.163	1.151	1.139	1.128	1.117
-5.00	1.312	1.297	1.283	1.269	1.255	1.241	1.228	1.215	1.202	1.190	1.177	1.165	1.153	1.142	1.130	1.119
-4.75	1.315	1.300	1.286	1.272	1.258	1.244	1.231	1.218	1.205	1.192	1.180	1.168	1.156	1.144	1.133	1.122
-4.50	1.318	1.303	1.289	1.275	1.261	1.247	1.234	1.221	1.208	1.195	1.183	1.171	1.159	1.147	1.135	1.124
-4.25	1.321	1.307	1.292	1.278	1.264	1.250	1.237	1.223	1.210	1.198	1.185	1.173	1.161	1.149	1.138	1.127
-4.00	1.325	1.310	1.295	1.281	1.267	1.253	1.239	1.226	1.213	1.201	1.188	1.176	1.164	1.152	1.140	1.129
-3.75	1.328	1.313	1.298	1.284	1.270	1.256	1.242	1.229	1.216	1.203	1.191	1.179	1.166	1.155	1.143	1.132
-3.50	1.331	1.316	1.301	1.287	1.273	1.259	1.245	1.232	1.219	1.206	1.193	1.181	1.169	1.157	1.146	1.134
-3.25	1.334	1.319	1.304	1.290	1.276	1.262	1.248	1.235	1.222	1.209	1.196	1.184	1.172	1.160	1.148	1.137
-3.00	1.337	1.322	1.307	1.293	1.279	1.265	1.251	1.238	1.224	1.212	1.199	1.186	1.174	1.162	1.151	1.139

续表 A2

 10^{-6}kPa

温度 ℃	15℃ 时密度, kg/m^3															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
-2.75	1.340	1.325	1.310	1.296	1.282	1.268	1.254	1.240	1.227	1.214	1.202	1.189	1.177	1.165	1.153	1.142
-2.50	1.344	1.328	1.314	1.299	1.285	1.271	1.257	1.243	1.230	1.217	1.204	1.192	1.180	1.168	1.156	1.144
-2.25	1.347	1.332	1.317	1.302	1.288	1.274	1.260	1.246	1.233	1.220	1.207	1.195	1.182	1.170	1.158	1.147
-2.00	1.350	1.335	1.320	1.305	1.291	1.276	1.263	1.249	1.236	1.223	1.210	1.197	1.185	1.173	1.161	1.149
-1.75	1.353	1.338	1.323	1.308	1.294	1.279	1.266	1.252	1.239	1.225	1.213	1.200	1.187	1.175	1.163	1.152
-1.50	1.357	1.341	1.326	1.311	1.297	1.282	1.269	1.255	1.241	1.228	1.215	1.203	1.190	1.178	1.166	1.154
-1.25	1.360	1.344	1.329	1.314	1.300	1.285	1.271	1.258	1.244	1.231	1.218	1.205	1.193	1.181	1.169	1.157
-1.00	1.363	1.348	1.332	1.317	1.303	1.288	1.274	1.261	1.247	1.234	1.221	1.208	1.195	1.183	1.171	1.159
-0.75	1.366	1.351	1.336	1.321	1.306	1.291	1.277	1.263	1.250	1.237	1.224	1.211	1.198	1.186	1.174	1.162
-0.50	1.370	1.354	1.339	1.324	1.309	1.294	1.280	1.266	1.253	1.239	1.226	1.214	1.201	1.188	1.176	1.164
-0.25	1.373	1.357	1.342	1.327	1.312	1.297	1.283	1.269	1.256	1.242	1.229	1.216	1.204	1.191	1.179	1.167
0.00	1.376	1.361	1.345	1.330	1.315	1.301	1.286	1.272	1.259	1.245	1.232	1.219	1.206	1.194	1.182	1.170
0.25	1.380	1.364	1.348	1.333	1.318	1.304	1.289	1.275	1.261	1.248	1.235	1.222	1.209	1.196	1.184	1.172
0.50	1.383	1.367	1.351	1.336	1.321	1.307	1.292	1.278	1.264	1.251	1.237	1.224	1.212	1.199	1.187	1.175
0.75	1.386	1.370	1.355	1.339	1.324	1.310	1.295	1.281	1.267	1.254	1.240	1.227	1.214	1.202	1.189	1.177
1.00	1.390	1.374	1.358	1.342	1.327	1.313	1.298	1.284	1.270	1.257	1.243	1.230	1.217	1.204	1.192	1.180
1.25	1.393	1.377	1.361	1.346	1.331	1.316	1.301	1.287	1.273	1.259	1.246	1.233	1.220	1.207	1.195	1.183
1.50	1.396	1.380	1.364	1.349	1.334	1.319	1.304	1.290	1.276	1.262	1.249	1.236	1.223	1.210	1.197	1.185
1.75	1.400	1.383	1.368	1.352	1.337	1.322	1.307	1.293	1.279	1.265	1.252	1.238	1.225	1.213	1.200	1.188
2.00	1.403	1.387	1.371	1.355	1.340	1.325	1.310	1.296	1.282	1.268	1.254	1.241	1.228	1.215	1.203	1.190
2.25	1.406	1.390	1.374	1.358	1.343	1.328	1.313	1.299	1.285	1.271	1.257	1.244	1.231	1.218	1.205	1.193
2.50	1.410	1.393	1.377	1.362	1.346	1.331	1.316	1.302	1.288	1.274	1.260	1.247	1.234	1.221	1.208	1.196
2.75	1.413	1.397	1.381	1.365	1.349	1.334	1.319	1.305	1.291	1.277	1.263	1.250	1.236	1.223	1.211	1.198
3.00	1.417	1.400	1.384	1.368	1.353	1.337	1.323	1.308	1.294	1.280	1.266	1.252	1.239	1.226	1.213	1.201
3.25	1.420	1.403	1.387	1.371	1.356	1.340	1.326	1.311	1.297	1.283	1.269	1.255	1.242	1.229	1.216	1.204
3.50	1.423	1.407	1.390	1.375	1.359	1.344	1.329	1.314	1.300	1.285	1.272	1.258	1.245	1.232	1.219	1.206
3.75	1.427	1.410	1.394	1.378	1.362	1.347	1.332	1.317	1.303	1.288	1.274	1.261	1.247	1.234	1.222	1.209
4.00	1.430	1.413	1.397	1.381	1.365	1.350	1.335	1.320	1.305	1.291	1.277	1.264	1.250	1.237	1.224	1.212
4.25	1.434	1.417	1.400	1.384	1.369	1.353	1.338	1.323	1.308	1.294	1.280	1.267	1.253	1.240	1.227	1.214

续表 A2

 10^{-6}kPa

温度 ℃	15℃时密度, kg/m^3															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
4.50	1.437	1.420	1.404	1.388	1.372	1.356	1.341	1.326	1.311	1.297	1.283	1.269	1.256	1.243	1.230	1.217
4.75	1.440	1.424	1.407	1.391	1.375	1.359	1.344	1.329	1.315	1.300	1.286	1.272	1.259	1.245	1.232	1.220
5.00	1.444	1.427	1.410	1.394	1.378	1.363	1.347	1.332	1.318	1.303	1.289	1.275	1.261	1.248	1.235	1.222
5.25	1.447	1.430	1.414	1.397	1.381	1.366	1.350	1.335	1.321	1.306	1.292	1.278	1.264	1.251	1.238	1.225
5.50	1.451	1.434	1.417	1.401	1.385	1.369	1.354	1.338	1.324	1.309	1.295	1.281	1.267	1.254	1.241	1.228
5.75	1.454	1.437	1.420	1.404	1.388	1.372	1.357	1.341	1.327	1.312	1.298	1.284	1.270	1.257	1.243	1.230
6.00	1.458	1.441	1.424	1.407	1.391	1.375	1.360	1.345	1.330	1.315	1.301	1.287	1.273	1.259	1.246	1.233
6.25	1.461	1.444	1.427	1.411	1.394	1.379	1.363	1.348	1.333	1.318	1.304	1.290	1.276	1.262	1.249	1.236
6.50	1.465	1.448	1.431	1.414	1.398	1.382	1.366	1.351	1.336	1.321	1.307	1.292	1.279	1.265	1.252	1.239
6.75	1.468	1.451	1.434	1.417	1.401	1.385	1.369	1.354	1.339	1.324	1.310	1.295	1.281	1.268	1.254	1.241
7.00	1.472	1.454	1.437	1.421	1.404	1.388	1.372	1.357	1.342	1.327	1.313	1.298	1.284	1.271	1.257	1.244
7.25	1.475	1.458	1.441	1.424	1.408	1.391	1.376	1.360	1.345	1.330	1.316	1.301	1.287	1.273	1.260	1.247
7.50	1.479	1.461	1.444	1.427	1.411	1.395	1.379	1.363	1.348	1.333	1.318	1.304	1.290	1.276	1.263	1.249
7.75	1.483	1.465	1.448	1.431	1.414	1.398	1.382	1.366	1.351	1.336	1.321	1.307	1.293	1.279	1.266	1.252
8.00	1.486	1.468	1.451	1.434	1.417	1.401	1.385	1.370	1.354	1.339	1.324	1.310	1.296	1.282	1.268	1.255
8.25	1.490	1.472	1.454	1.437	1.421	1.404	1.388	1.373	1.357	1.342	1.327	1.313	1.299	1.285	1.271	1.258
8.50	1.493	1.475	1.458	1.441	1.424	1.408	1.392	1.376	1.360	1.345	1.330	1.316	1.302	1.288	1.274	1.261
8.75	1.497	1.479	1.461	1.444	1.427	1.411	1.395	1.379	1.364	1.348	1.334	1.319	1.305	1.294	1.277	1.263
9.00	1.500	1.482	1.465	1.448	1.431	1.414	1.398	1.382	1.367	1.351	1.337	1.322	1.307	1.293	1.280	1.266
9.25	1.504	1.486	1.468	1.451	1.434	1.418	1.401	1.385	1.370	1.355	1.340	1.325	1.310	1.296	1.282	1.269
9.50	1.508	1.490	1.472	1.454	1.438	1.421	1.405	1.389	1.373	1.358	1.343	1.328	1.313	1.299	1.285	1.272
9.75	1.511	1.493	1.475	1.458	1.441	1.424	1.408	1.392	1.376	1.361	1.346	1.331	1.316	1.302	1.288	1.274
10.00	1.515	1.497	1.479	1.461	1.444	1.428	1.411	1.395	1.379	1.364	1.349	1.334	1.322	1.305	1.294	1.277
10.25	1.519	1.500	1.482	1.465	1.448	1.431	1.414	1.398	1.382	1.367	1.352	1.337	1.322	1.308	1.294	1.280
10.50	1.522	1.504	1.486	1.468	1.451	1.434	1.418	1.401	1.386	1.370	1.355	1.340	1.325	1.311	1.297	1.283
10.75	1.526	1.507	1.489	1.472	1.455	1.438	1.421	1.405	1.389	1.373	1.358	1.343	1.328	1.314	1.300	1.286
11.00	1.529	1.511	1.493	1.475	1.458	1.441	1.424	1.408	1.392	1.376	1.361	1.346	1.331	1.317	1.303	1.289
11.25	1.533	1.515	1.496	1.479	1.461	1.444	1.428	1.411	1.395	1.379	1.364	1.349	1.334	1.320	1.305	1.291
11.50	1.537	1.518	1.500	1.482	1.465	1.448	1.431	1.414	1.398	1.383	1.367	1.352	1.337	1.323	1.308	1.294

续表 A2

 10^{-6}kPa

温度 ℃	15℃时密度, kg/m^3															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
11.75	1.541	1.522	1.504	1.486	1.468	1.451	1.434	1.418	1.402	1.386	1.370	1.355	1.340	1.325	1.311	1.297
12.00	1.544	1.526	1.507	1.489	1.472	1.454	1.438	1.421	1.405	1.389	1.373	1.358	1.343	1.328	1.314	1.300
12.25	1.548	1.529	1.511	1.493	1.475	1.458	1.441	1.424	1.408	1.392	1.376	1.361	1.346	1.331	1.317	1.303
12.50	1.552	1.533	1.514	1.496	1.479	1.461	1.444	1.428	1.411	1.395	1.380	1.364	1.349	1.334	1.320	1.306
12.75	1.555	1.536	1.518	1.500	1.482	1.465	1.448	1.431	1.414	1.398	1.383	1.367	1.352	1.337	1.323	1.309
13.00	1.559	1.540	1.521	1.503	1.486	1.468	1.451	1.434	1.418	1.402	1.386	1.370	1.355	1.340	1.326	1.311
13.25	1.563	1.544	1.525	1.507	1.489	1.471	1.454	1.437	1.421	1.405	1.389	1.373	1.358	1.343	1.329	1.314
13.50	1.567	1.547	1.529	1.510	1.492	1.475	1.458	1.441	1.424	1.408	1.392	1.377	1.361	1.346	1.332	1.317
13.75	1.570	1.551	1.532	1.514	1.496	1.478	1.461	1.444	1.427	1.411	1.395	1.380	1.364	1.349	1.335	1.320
14.00	1.574	1.555	1.536	1.518	1.499	1.482	1.464	1.447	1.431	1.414	1.398	1.383	1.367	1.352	1.338	1.323
14.25	1.578	1.559	1.540	1.521	1.503	1.485	1.468	1.451	1.434	1.418	1.402	1.386	1.370	1.355	1.341	1.326
14.50	1.582	1.562	1.543	1.525	1.507	1.489	1.471	1.454	1.437	1.421	1.405	1.389	1.374	1.358	1.344	1.329
14.75	1.586	1.566	1.547	1.528	1.510	1.492	1.475	1.457	1.441	1.424	1.408	1.392	1.377	1.361	1.346	1.332
15.00	1.589	1.570	1.551	1.532	1.514	1.496	1.478	1.461	1.444	1.427	1.411	1.395	1.380	1.364	1.349	1.335
15.25	1.593	1.574	1.554	1.536	1.517	1.499	1.481	1.464	1.447	1.431	1.414	1.398	1.383	1.367	1.352	1.338
15.50	1.597	1.577	1.558	1.539	1.521	1.503	1.485	1.468	1.451	1.434	1.418	1.402	1.386	1.370	1.355	1.341
15.75	1.601	1.581	1.562	1.543	1.524	1.506	1.488	1.471	1.454	1.437	1.421	1.405	1.389	1.374	1.358	1.344
16.00	1.605	1.585	1.565	1.546	1.528	1.510	1.492	1.474	1.457	1.440	1.424	1.408	1.392	1.377	1.361	1.347
16.25	1.608	1.589	1.569	1.550	1.531	1.513	1.495	1.478	1.461	1.444	1.427	1.411	1.395	1.380	1.364	1.350
16.50	1.612	1.592	1.573	1.554	1.535	1.517	1.499	1.481	1.464	1.447	1.430	1.414	1.398	1.383	1.368	1.353
16.75	1.616	1.596	1.577	1.557	1.539	1.520	1.502	1.485	1.467	1.450	1.434	1.417	1.401	1.386	1.371	1.356
17.00	1.620	1.600	1.580	1.561	1.542	1.524	1.506	1.488	1.471	1.454	1.437	1.421	1.405	1.389	1.374	1.358
17.25	1.624	1.604	1.584	1.565	1.546	1.527	1.509	1.491	1.474	1.457	1.440	1.424	1.408	1.392	1.377	1.361
17.50	1.628	1.608	1.588	1.568	1.549	1.531	1.513	1.495	1.477	1.460	1.443	1.427	1.411	1.395	1.380	1.364
17.75	1.632	1.612	1.592	1.572	1.553	1.534	1.516	1.498	1.481	1.464	1.447	1.430	1.414	1.398	1.383	1.367
18.00	1.636	1.615	1.595	1.576	1.557	1.538	1.520	1.502	1.484	1.467	1.450	1.434	1.417	1.401	1.386	1.371
18.25	1.640	1.619	1.599	1.580	1.560	1.542	1.523	1.505	1.488	1.470	1.453	1.437	1.420	1.404	1.389	1.374
18.50	1.644	1.623	1.603	1.583	1.564	1.545	1.527	1.509	1.491	1.474	1.457	1.440	1.424	1.408	1.392	1.377
18.75	1.648	1.627	1.607	1.587	1.568	1.549	1.530	1.512	1.494	1.477	1.460	1.443	1.427	1.411	1.395	1.380

续表 A2

10⁻⁶kPa

温度 ℃	15℃时密度, kg/m ³															
	670	672	674	676	678	680	682	684	686	688	690	692	694	696	698	700
19.00	1.651	1.631	1.611	1.591	1.571	1.552	1.534	1.516	1.498	1.480	1.463	1.446	1.430	1.414	1.398	1.383
19.25	1.655	1.635	1.614	1.595	1.575	1.556	1.537	1.519	1.501	1.484	1.467	1.450	1.433	1.417	1.401	1.386
19.50	1.659	1.639	1.618	1.598	1.579	1.560	1.541	1.523	1.505	1.487	1.470	1.453	1.436	1.420	1.404	1.389
19.75	1.663	1.643	1.622	1.602	1.583	1.563	1.545	1.526	1.508	1.491	1.473	1.456	1.440	1.423	1.407	1.392
20.00	1.667	1.646	1.626	1.606	1.586	1.567	1.548	1.530	1.512	1.494	1.477	1.460	1.443	1.427	1.411	1.395

附 录 B
液态烃温度修正系数
(补 充 件)

表 B1 液态烃温度修正系数

(温度-20~20℃, 15℃时密度 610~700kg/m³)

温度 ℃	15℃时密度, kg/m ³										
	610.0	612.0	614.0	616.0	618.0	620.0	622.0	624.0	626.0	628.0	630.0
-18.75	—	—	—	—	—	—	—	—	—	—	—
-18.50	—	—	—	—	—	—	—	—	—	—	—
-18.25	—	—	—	—	—	—	—	—	—	—	—
-18.00	—	1.0531	1.0528	1.0524	1.0521	1.0518	1.0515	1.0511	1.0508	1.0505	1.0502
-17.75	—	1.0527	1.0524	1.0521	1.0517	1.0514	1.0511	1.0508	1.0504	1.0501	1.0498
-17.50	—	1.0523	1.0520	1.0517	1.0513	1.0510	1.0507	1.0504	1.0501	1.0497	1.0494
-17.25	—	1.0519	1.0516	1.0513	1.0510	1.0506	1.0503	1.0500	1.0497	1.0494	1.0491
-17.00	—	1.0515	1.0512	1.0509	1.0506	1.0502	1.0499	1.0496	1.0493	1.0490	1.0487
-16.75	—	1.0511	1.0508	1.0505	1.0502	1.0499	1.0495	1.0492	1.0489	1.0486	1.0483
-16.50	—	1.0508	1.0504	1.0501	1.0498	1.0495	1.0492	1.0489	1.0485	1.0482	1.0479
-16.25	—	1.0504	1.0500	1.0497	1.0494	1.0491	1.0488	1.0485	1.0482	1.0479	1.0476
-16.00	—	1.0500	1.0496	1.0493	1.0490	1.0487	1.0484	1.0481	1.0478	1.0475	1.0472
-15.75	—	1.0496	1.0492	1.0489	1.0486	1.0483	1.0480	1.0477	1.0474	1.0471	1.0468
-15.50	—	1.0492	1.0489	1.0485	1.0482	1.0479	1.0476	1.0473	1.0470	1.0467	1.0464
-15.25	—	1.0488	1.0485	1.0482	1.0478	1.0475	1.0472	1.0469	1.0467	1.0464	1.0461
-15.00	—	1.0484	1.0481	1.0478	1.0475	1.0472	1.0469	1.0466	1.0463	1.0460	1.0457
-14.75	—	1.0480	1.0477	1.0474	1.0471	1.0468	1.0465	1.0462	1.0459	1.0456	1.0453
-14.50	—	1.0476	1.0473	1.0470	1.0467	1.0464	1.0461	1.0458	1.0455	1.0452	1.0449
-14.25	—	1.0472	1.0469	1.0466	1.0463	1.0460	1.0457	1.0454	1.0451	1.0449	1.0446
-14.00	—	1.0468	1.0465	1.0462	1.0459	1.0456	1.0453	1.0450	1.0448	1.0445	1.0442
-13.75	—	1.0464	1.0461	1.0458	1.0455	1.0452	1.0449	1.0447	1.0444	1.0441	1.0438
-13.50	—	1.0460	1.0457	1.0454	1.0451	1.0448	1.0446	1.0443	1.0440	1.0437	1.0434
-13.25	—	1.0456	1.0453	1.0450	1.0447	1.0445	1.0442	1.0439	1.0436	1.0433	1.0431
-13.00	—	1.0452	1.0449	1.0446	1.0443	1.0441	1.0438	1.0435	1.0432	1.0430	1.0427
-12.75	—	1.0448	1.0445	1.0442	1.0440	1.0437	1.0434	1.0431	1.0429	1.0426	1.0423
-12.50	—	1.0444	1.0441	1.0438	1.0436	1.0433	1.0430	1.0427	1.0425	1.0422	1.0419
-12.25	—	1.0440	1.0437	1.0435	1.0432	1.0429	1.0426	1.0424	1.0421	1.0418	1.0416
-12.00	—	1.0436	1.0433	1.0431	1.0428	1.0425	1.0422	1.0420	1.0417	1.0415	1.0412
-11.75	—	1.0432	1.0429	1.0427	1.0424	1.0421	1.0419	1.0416	1.0413	1.0411	1.0408
-11.50	—	1.0428	1.0425	1.0423	1.0420	1.0417	1.0415	1.0412	1.0410	1.0407	1.0404

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	610.0	612.0	614.0	616.0	618.0	620.0	622.0	624.0	626.0	628.0	630.0
-11.25	—	1.0424	1.0422	1.0419	1.0416	1.0414	1.0411	1.0408	1.0406	1.0403	1.0401
-11.00	—	1.0420	1.0418	1.0415	1.0412	1.0410	1.0407	1.0404	1.0402	1.0399	1.0397
-10.75	—	1.0416	1.0414	1.0411	1.0408	1.0406	1.0403	1.0401	1.0398	1.0396	1.0393
-10.50	—	1.0412	1.0410	1.0407	1.0404	1.0402	1.0399	1.0397	1.0394	1.0392	1.0389
-10.25	—	1.0408	1.0406	1.0403	1.0401	1.0398	1.0395	1.0393	1.0391	1.0388	1.0386
-10.00	—	1.0404	1.0402	1.0399	1.0397	1.0394	1.0392	1.0389	1.0387	1.0384	1.0382
-9.75	—	1.0400	1.0398	1.0395	1.0393	1.0390	1.0388	1.0385	1.0383	1.0380	1.0378
-9.50	—	1.0396	1.0394	1.0391	1.0389	1.0386	1.0384	1.0381	1.0379	1.0377	1.0374
-9.25	—	1.0392	1.0390	1.0387	1.0385	1.0382	1.0380	1.0378	1.0375	1.0373	1.0371
-9.00	—	1.0388	1.0386	1.0383	1.0381	1.0379	1.0376	1.0374	1.0371	1.0369	1.0367
-8.75	—	1.0384	1.0382	1.0379	1.0377	1.0375	1.0372	1.0370	1.0368	1.0365	1.0363
-8.50	—	1.0380	1.0378	1.0376	1.0373	1.0371	1.0368	1.0366	1.0364	1.0362	1.0359
-8.25	—	1.0376	1.0374	1.0372	1.0369	1.0367	1.0365	1.0362	1.0360	1.0358	1.0355
-8.00	—	1.0372	1.0370	1.0368	1.0365	1.0363	1.0361	1.0358	1.0356	1.0354	1.0352
-7.75	—	1.0368	1.0366	1.0364	1.0361	1.0359	1.0357	1.0355	1.0352	1.0350	1.0348
-7.50	—	1.0364	1.0362	1.0360	1.0357	1.0355	1.0353	1.0351	1.0349	1.0346	1.0344
-7.25	—	1.0360	1.0358	1.0356	1.0354	1.0351	1.0349	1.0347	1.0345	1.0343	1.0340
-7.00	—	1.0356	1.0354	1.0352	1.0350	1.0347	1.0345	1.0343	1.0341	1.0339	1.0337
-6.75	—	1.0352	1.0350	1.0348	1.0346	1.0344	1.0341	1.0339	1.0337	1.0335	1.0333
-6.50	—	1.0348	1.0346	1.0344	1.0342	1.0340	1.0337	1.0335	1.0333	1.0331	1.0329
-6.25	—	1.0344	1.0342	1.0340	1.0338	1.0336	1.0334	1.0331	1.0329	1.0327	1.0325
-6.00	—	1.0340	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328	1.0326	1.0323	1.0321
-5.75	—	1.0336	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320	1.0318
-5.50	—	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320	1.0318	1.0316	1.0314
-5.25	—	1.0328	1.0326	1.0324	1.0322	1.0320	1.0318	1.0316	1.0314	1.0312	1.0310
-5.00	—	1.0324	1.0322	1.0320	1.0318	1.0316	1.0314	1.0312	1.0310	1.0308	1.0306
-4.75	—	1.0320	1.0318	1.0316	1.0314	1.0312	1.0310	1.0308	1.0306	1.0304	1.0303
-4.50	—	1.0316	1.0314	1.0312	1.0310	1.0308	1.0306	1.0304	1.0303	1.0301	1.0299
-4.25	—	1.0312	1.0310	1.0308	1.0306	1.0304	1.0303	1.0301	1.0299	1.0297	1.0295
-4.00	—	1.0308	1.0306	1.0304	1.0302	1.0301	1.0299	1.0297	1.0295	1.0293	1.0291
-3.75	—	1.0304	1.0302	1.0300	1.0299	1.0297	1.0295	1.0293	1.0291	1.0289	1.0287
-3.50	—	1.0300	1.0298	1.0296	1.0295	1.0293	1.0291	1.0289	1.0287	1.0285	1.0284
-3.25	—	1.0296	1.0294	1.0293	1.0291	1.0289	1.0287	1.0285	1.0283	1.0282	1.0280
-3.00	—	1.0292	1.0290	1.0289	1.0287	1.0285	1.0283	1.0281	1.0279	1.0278	1.0276
-2.75	—	1.0288	1.0286	1.0285	1.0283	1.0281	1.0279	1.0277	1.0276	1.0274	1.0272

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	610.0	612.0	614.0	616.0	618.0	620.0	622.0	624.0	626.0	628.0	630.0
-2.50	—	1.0284	1.0282	1.0281	1.0279	1.0277	1.0275	1.0274	1.0272	1.0270	1.0268
-2.25	—	1.0280	1.0278	1.0277	1.0275	1.0273	1.0271	1.0270	1.0268	1.0266	1.0265
-2.00	—	1.0276	1.0274	1.0273	1.0271	1.0269	1.0267	1.0266	1.0264	1.0262	1.0261
-1.75	—	1.0272	1.0270	1.0269	1.0267	1.0265	1.0264	1.0262	1.0260	1.0259	1.0257
-1.50	—	1.0268	1.0266	1.0265	1.0263	1.0261	1.0260	1.0258	1.0256	1.0255	1.0253
-1.25	—	1.0264	1.0262	1.0261	1.0259	1.0257	1.0256	1.0254	1.0253	1.0251	1.0249
-1.00	—	1.0260	1.0258	1.0257	1.0255	1.0253	1.0252	1.0250	1.0249	1.0247	1.0246
-0.75	—	1.0256	1.0254	1.0253	1.0251	1.0250	1.0248	1.0246	1.0245	1.0243	1.0242
-0.50	—	1.0252	1.0250	1.0249	1.0247	1.0246	1.0244	1.0243	1.0241	1.0239	1.0238
-0.25	—	1.0248	1.0246	1.0245	1.0243	1.0242	1.0240	1.0239	1.0237	1.0236	1.0234
0.0	—	1.0244	1.0242	1.0241	1.0239	1.0238	1.0236	1.0235	1.0233	1.0232	1.0230
0.25	—	1.0240	1.0238	1.0237	1.0235	1.0234	1.0232	1.0231	1.0229	1.0228	1.0227
0.50	—	1.0236	1.0234	1.0233	1.0231	1.0230	1.0228	1.0227	1.0226	1.0224	1.0223
0.75	—	1.0232	1.0230	1.0229	1.0227	1.0226	1.0225	1.0223	1.0222	1.0220	1.0219
1.00	—	1.0228	1.0226	1.0225	1.0223	1.0222	1.0221	1.0219	1.0218	1.0216	1.0215
1.25	—	1.0224	1.0222	1.0221	1.0220	1.0218	1.0217	1.0215	1.0214	1.0213	1.0211
1.50	—	1.0220	1.0218	1.0217	1.0216	1.0214	1.0213	1.0211	1.0210	1.0209	1.0207
1.75	—	1.0216	1.0214	1.0213	1.0212	1.0210	1.0209	1.0208	1.0206	1.0205	1.0204
2.00	—	1.0212	1.0210	1.0209	1.0208	1.0206	1.0205	1.0204	1.0202	1.0201	1.0200
2.25	—	1.0208	1.0206	1.0205	1.0204	1.0202	1.0201	1.0200	1.0199	1.0197	1.0196
2.50	—	1.0204	1.0202	1.0201	1.0200	1.0198	1.0197	1.0196	1.0195	1.0193	1.0192
2.75	—	1.0200	1.0198	1.0197	1.0196	1.0194	1.0193	1.0192	1.0191	1.0190	1.0188
3.00	—	1.0196	1.0194	1.0193	1.0192	1.0191	1.0189	1.0188	1.0187	1.0186	1.0185
3.25	—	1.0191	1.0190	1.0189	1.0188	1.0187	1.0185	1.0184	1.0183	1.0182	1.0181
3.50	—	1.0187	1.0186	1.0185	1.0184	1.0183	1.0181	1.0180	1.0179	1.0178	1.0177
3.75	—	1.0183	1.0182	1.0181	1.0180	1.0179	1.0178	1.0176	1.0175	1.0174	1.0173
4.00	—	1.0179	1.0178	1.0177	1.0176	1.0175	1.0174	1.0173	1.0171	1.0170	1.0169
4.25	—	1.0175	1.0174	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168	1.0166	1.0165
4.50	—	1.0171	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162
4.75	—	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160	1.0159	1.0158
5.00	—	1.0163	1.0162	1.0161	1.0160	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154
5.25	—	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154	1.0153	1.0152	1.0151	1.0150
5.50	—	1.0155	1.0154	1.0153	1.0152	1.0151	1.0150	1.0149	1.0148	1.0147	1.0146
5.75	—	1.0151	1.0150	1.0149	1.0148	1.0147	1.0146	1.0145	1.0144	1.0143	1.0142
6.00	—	1.0147	1.0146	1.0145	1.0144	1.0143	1.0142	1.0141	1.0140	1.0140	1.0139

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	610.0	612.0	614.0	616.0	618.0	620.0	622.0	624.0	626.0	628.0	630.0
6.25	—	1.0143	1.0142	1.0141	1.0140	1.0139	1.0138	1.0137	1.0137	1.0136	1.0135
6.50	—	1.0139	1.0138	1.0137	1.0136	1.0135	1.0134	1.0133	1.0133	1.0132	1.0131
6.75	—	1.0135	1.0134	1.0133	1.0132	1.0131	1.0130	1.0130	1.0129	1.0128	1.0127
7.00	—	1.0131	1.0130	1.0129	1.0128	1.0127	1.0126	1.0126	1.0125	1.0124	1.0123
7.25	—	1.0127	1.0126	1.0125	1.0124	1.0123	1.0123	1.0122	1.0121	1.0120	1.0119
7.50	—	1.0122	1.0122	1.0121	1.0120	1.0119	1.0119	1.0118	1.0117	1.0116	1.0116
7.75	—	1.0118	1.0118	1.0117	1.0116	1.0115	1.0115	1.0114	1.0113	1.0112	1.0112
8.00	—	1.0114	1.0114	1.0113	1.0112	1.0111	1.0111	1.0110	1.0109	1.0109	1.0108
8.25	—	1.0110	1.0110	1.0109	1.0108	1.0107	1.0107	1.0106	1.0105	1.0105	1.0104
8.50	—	1.0106	1.0106	1.0105	1.0104	1.0103	1.0103	1.0102	1.0102	1.0101	1.0100
8.75	—	1.0102	1.0101	1.0101	1.0100	1.0100	1.0099	1.0098	1.0098	1.0097	1.0096
9.00	—	1.0098	1.0097	1.0097	1.0096	1.0096	1.0095	1.0094	1.0094	1.0093	1.0093
9.25	—	1.0094	1.0093	1.0093	1.0092	1.0092	1.0091	1.0090	1.0090	1.0089	1.0089
9.50	—	1.0090	1.0089	1.0089	1.0088	1.0088	1.0087	1.0086	1.0086	1.0085	1.0085
9.75	—	1.0086	1.0085	1.0085	1.0084	1.0084	1.0083	1.0083	1.0082	1.0082	1.0081
10.00	—	1.0082	1.0081	1.0081	1.0080	1.0080	1.0079	1.0079	1.0078	1.0078	1.0077
10.25	—	1.0078	1.0077	1.0077	1.0076	1.0076	1.0075	1.0075	1.0074	1.0074	1.0073
10.50	—	1.0074	1.0073	1.0073	1.0072	1.0072	1.0071	1.0071	1.0070	1.0070	1.0069
10.75	—	1.0070	1.0069	1.0069	1.0068	1.0068	1.0067	1.0067	1.0066	1.0066	1.0066
11.00	—	1.0065	1.0065	1.0065	1.0064	1.0064	1.0063	1.0063	1.0063	1.0062	1.0062
11.25	—	1.0061	1.0061	1.0061	1.0060	1.0060	1.0059	1.0059	1.0059	1.0058	1.0058
11.50	—	1.0057	1.0057	1.0057	1.0056	1.0056	1.0055	1.0055	1.0055	1.0054	1.0054
11.75	—	1.0053	1.0053	1.0053	1.0052	1.0052	1.0051	1.0051	1.0051	1.0051	1.0050
12.00	—	1.0049	1.0049	1.0048	1.0048	1.0048	1.0048	1.0047	1.0047	1.0047	1.0046
12.25	—	1.0045	1.0045	1.0044	1.0044	1.0044	1.0044	1.0043	1.0043	1.0043	1.0042
12.50	—	1.0041	1.0041	1.0040	1.0040	1.0040	1.0040	1.0039	1.0039	1.0039	1.0039
12.75	—	1.0037	1.0037	1.0036	1.0036	1.0036	1.0036	1.0035	1.0035	1.0035	1.0035
13.00	—	1.0033	1.0033	1.0032	1.0032	1.0032	1.0032	1.0032	1.0031	1.0031	1.0031
13.25	—	1.0029	1.0028	1.0028	1.0028	1.0028	1.0028	1.0028	1.0027	1.0027	1.0027
13.50	—	1.0025	1.0024	1.0024	1.0024	1.0024	1.0024	1.0024	1.0023	1.0023	1.0023
13.75	—	1.0020	1.0020	1.0020	1.0020	1.0020	1.0020	1.0020	1.0020	1.0019	1.0019
14.00	—	1.0016	1.0016	1.0016	1.0016	1.0016	1.0016	1.0016	1.0016	1.0016	1.0015
14.25	—	1.0012	1.0012	1.0012	1.0012	1.0012	1.0012	1.0012	1.0012	1.0012	1.0012
14.50	—	1.0008	1.0008	1.0008	1.0008	1.0008	1.0008	1.0008	1.0008	1.0008	1.0008
14.75	—	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	610.0	612.0	614.0	616.0	618.0	620.0	622.0	624.0	626.0	628.0	630.0
15.00	—	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
15.25	—	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996
15.50	—	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992
15.75	—	0.9988	0.9988	0.9988	0.9988	0.9988	0.9988	0.9988	0.9988	0.9988	0.9988
16.00	—	0.9984	0.9984	0.9984	0.9984	0.9984	0.9984	0.9984	0.9984	0.9984	0.9985
16.25	—	0.9979	0.9980	0.9980	0.9980	0.9980	0.9980	0.9980	0.9980	0.9981	0.9981
16.50	—	0.9975	0.9976	0.9976	0.9976	0.9976	0.9976	0.9976	0.9976	0.9977	0.9977
16.75	—	0.9971	0.9971	0.9972	0.9972	0.9972	0.9972	0.9972	0.9973	0.9973	0.9973
17.00	—	0.9967	0.9967	0.9968	0.9968	0.9968	0.9968	0.9968	0.9969	0.9969	0.9969
17.25	—	0.9963	0.9963	0.9964	0.9964	0.9964	0.9964	0.9964	0.9965	0.9965	0.9965
17.50	—	0.9959	0.9959	0.9960	0.9960	0.9960	0.9960	0.9961	0.9961	0.9961	0.9961
17.75	—	0.9955	0.9955	0.9955	0.9956	0.9956	0.9956	0.9957	0.9957	0.9957	0.9957
18.00	—	0.9951	0.9951	0.9951	0.9952	0.9952	0.9952	0.9953	0.9953	0.9953	0.9954
18.25	—	0.9947	0.9947	0.9947	0.9948	0.9948	0.9948	0.9949	0.9949	0.9949	0.9950
18.50	—	0.9943	0.9943	0.9943	0.9944	0.9944	0.9944	0.9945	0.9945	0.9945	0.9946
18.75	—	0.9938	0.9939	0.9939	0.9940	0.9940	0.9940	0.9941	0.9941	0.9942	0.9942
19.00	—	0.9934	0.9935	0.9935	0.9936	0.9936	0.9936	0.9937	0.9937	0.9938	0.9938
19.25	—	0.9930	0.9931	0.9931	0.9932	0.9932	0.9932	0.9933	0.9933	0.9934	0.9934
19.50	—	0.9926	0.9927	0.9927	0.9928	0.9928	0.9928	0.9929	0.9929	0.9930	0.9930
19.75	—	0.9922	0.9922	0.9923	0.9923	0.9924	0.9924	0.9925	0.9925	0.9926	0.9926
20.00	—	0.9918	0.9918	0.9919	0.9919	0.9920	0.9920	0.9921	0.9921	0.9922	0.9922
温度 ℃	15℃时密度, kg/m ³										
	630.0	632.0	634.0	636.0	638.0	640.0	642.0	644.0	646.0	648.0	650.0
-20.00	—	—	—	—	—	—	—	—	—	—	—
-19.75	—	—	—	—	—	—	—	—	—	—	—
-19.50	—	—	—	—	—	—	—	—	—	—	—
-19.25	—	—	—	—	—	—	—	—	—	—	—
-19.00	—	—	—	—	—	—	—	—	—	—	—
-18.75	—	—	—	—	—	—	—	—	—	—	—
-18.50	—	—	—	—	—	—	—	—	—	—	—
-18.25	—	—	—	—	—	—	—	—	—	—	—
-18.00	1.0502	1.0499	1.0496	1.0493	1.0490	1.0487	1.0484	1.0481	1.0478	1.0475	1.0472
-17.75	1.0498	1.0495	1.0492	1.0489	1.0486	1.0483	1.0480	1.0477	1.0474	1.0471	1.0468

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	630.0	632.0	634.0	636.0	638.0	640.0	642.0	644.0	646.0	648.0	650.0
-17.50	1.0494	1.0491	1.0488	1.0485	1.0482	1.0479	1.0476	1.0473	1.0471	1.0468	1.0465
-17.25	1.0491	1.0488	1.0485	1.0482	1.0479	1.0476	1.0473	1.0470	1.0467	1.0464	1.0461
-17.00	1.0487	1.0484	1.0481	1.0478	1.0475	1.0472	1.0469	1.0466	1.0463	1.0461	1.0458
-16.75	1.0483	1.0480	1.0477	1.0474	1.0471	1.0468	1.0466	1.0463	1.0460	1.0457	1.0454
-16.50	1.0479	1.0476	1.0474	1.0471	1.0468	1.0465	1.0462	1.0459	1.0456	1.0454	1.0451
-16.25	1.0476	1.0473	1.0470	1.0467	1.0464	1.0461	1.0458	1.0456	1.0453	1.0450	1.0447
-16.00	1.0472	1.0469	1.0466	1.0463	1.0460	1.0458	1.0455	1.0452	1.0449	1.0447	1.0444
-15.75	1.0468	1.0465	1.0462	1.0460	1.0457	1.0454	1.0451	1.0448	1.0446	1.0443	1.0440
-15.50	1.0464	1.0462	1.0459	1.0456	1.0453	1.0450	1.0448	1.0445	1.0442	1.0439	1.0437
-15.25	1.0461	1.0458	1.0455	1.0452	1.0449	1.0447	1.0444	1.0441	1.0439	1.0436	1.0433
-15.00	1.0457	1.0454	1.0451	1.0449	1.0446	1.0443	1.0440	1.0438	1.0435	1.0432	1.0430
-14.75	1.0453	1.0450	1.0448	1.0445	1.0442	1.0439	1.0437	1.0434	1.0431	1.0429	1.0426
-14.50	1.0449	1.0447	1.0444	1.0441	1.0438	1.0436	1.0433	1.0430	1.0428	1.0425	1.0423
-14.25	1.0446	1.0443	1.0440	1.0438	1.0435	1.0432	1.0429	1.0427	1.0424	1.0422	1.0419
-14.00	1.0442	1.0439	1.0437	1.0434	1.0431	1.0429	1.0426	1.0423	1.0421	1.0418	1.0416
-13.75	1.0438	1.0436	1.0433	1.0430	1.0428	1.0425	1.0422	1.0420	1.0417	1.0415	1.0412
-13.50	1.0434	1.0432	1.0429	1.0426	1.0424	1.0421	1.0419	1.0416	1.0414	1.0411	1.0409
-13.25	1.0431	1.0428	1.0425	1.0423	1.0420	1.0418	1.0415	1.0413	1.0410	1.0408	1.0405
-13.00	1.0427	1.0424	1.0422	1.0419	1.0417	1.0414	1.0411	1.0409	1.0406	1.0404	1.0402
-12.75	1.0423	1.0421	1.0418	1.0415	1.0413	1.0410	1.0408	1.0405	1.0403	1.0400	1.0398
-12.50	1.0419	1.0417	1.0414	1.0412	1.0409	1.0407	1.0404	1.0402	1.0399	1.0397	1.0394
-12.25	1.0416	1.0413	1.0411	1.0408	1.0406	1.0403	1.0401	1.0398	1.0396	1.0393	1.0391
-12.00	1.0412	1.0409	1.0407	1.0404	1.0402	1.0399	1.0397	1.0395	1.0392	1.0390	1.0387
-11.75	1.0408	1.0406	1.0403	1.0401	1.0398	1.0396	1.0393	1.0391	1.0389	1.0386	1.0384
-11.50	1.0404	1.0402	1.0399	1.0397	1.0395	1.0392	1.0390	1.0387	1.0385	1.0383	1.0380
-11.25	1.0401	1.0398	1.0396	1.0393	1.0391	1.0388	1.0386	1.0384	1.0381	1.0379	1.0377
-11.00	1.0397	1.0394	1.0392	1.0390	1.0387	1.0385	1.0382	1.0380	1.0378	1.0375	1.0373
-10.75	1.0393	1.0391	1.0388	1.0386	1.0384	1.0381	1.0379	1.0376	1.0374	1.0372	1.0370
-10.50	1.0389	1.0387	1.0385	1.0382	1.0380	1.0378	1.0375	1.0373	1.0371	1.0368	1.0366
-10.25	1.0386	1.0383	1.0381	1.0379	1.0376	1.0374	1.0372	1.0369	1.0367	1.0365	1.0363
-10.00	1.0382	1.0379	1.0377	1.0375	1.0372	1.0370	1.0368	1.0366	1.0363	1.0361	1.0359
-9.75	1.0378	1.0376	1.0373	1.0371	1.0369	1.0367	1.0364	1.0362	1.0360	1.0358	1.0355
-9.50	1.0374	1.0372	1.0370	1.0367	1.0365	1.0363	1.0361	1.0358	1.0356	1.0354	1.0352
-9.25	1.0371	1.0368	1.0366	1.0364	1.0361	1.0359	1.0357	1.0355	1.0353	1.0351	1.0348
-9.00	1.0367	1.0365	1.0362	1.0360	1.0358	1.0356	1.0353	1.0351	1.0349	1.0347	1.0345

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	630.0	632.0	634.0	636.0	638.0	640.0	642.0	644.0	646.0	648.0	650.0
-8.75	1.0363	1.0361	1.0359	1.0356	1.0354	1.0352	1.0350	1.0348	1.0345	1.0343	1.0341
-8.50	1.0359	1.0357	1.0355	1.0353	1.0350	1.0348	1.0346	1.0344	1.0342	1.0340	1.0338
-8.25	1.0355	1.0353	1.0351	1.0349	1.0347	1.0345	1.0342	1.0340	1.0338	1.0336	1.0334
-8.00	1.0352	1.0350	1.0347	1.0345	1.0343	1.0341	1.0339	1.0337	1.0335	1.0333	1.0331
-7.75	1.0348	1.0346	1.0344	1.0341	1.0339	1.0337	1.0335	1.0333	1.0331	1.0329	1.0327
-7.50	1.0344	1.0342	1.0340	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324
-7.25	1.0340	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320
-7.00	1.0337	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320	1.0318	1.0316
-6.75	1.0333	1.0331	1.0329	1.0327	1.0325	1.0323	1.0321	1.0319	1.0317	1.0315	1.0313
-6.50	1.0329	1.0327	1.0325	1.0323	1.0321	1.0319	1.0317	1.0315	1.0313	1.0311	1.0309
-6.25	1.0325	1.0323	1.0321	1.0319	1.0317	1.0315	1.0313	1.0311	1.0310	1.0308	1.0306
-6.00	1.0321	1.0319	1.0317	1.0316	1.0314	1.0312	1.0310	1.0308	1.0306	1.0304	1.0302
-5.75	1.0318	1.0316	1.0314	1.0312	1.0310	1.0308	1.0306	1.0304	1.0302	1.0300	1.0299
-5.50	1.0314	1.0312	1.0310	1.0308	1.0306	1.0304	1.0302	1.0301	1.0299	1.0297	1.0295
-5.25	1.0310	1.0308	1.0306	1.0304	1.0302	1.0301	1.0299	1.0297	1.0295	1.0293	1.0292
-5.00	1.0306	1.0304	1.0303	1.0301	1.0299	1.0297	1.0295	1.0293	1.0291	1.0290	1.0288
-4.75	1.0303	1.0301	1.0299	1.0297	1.0295	1.0293	1.0291	1.0290	1.0288	1.0286	1.0284
-4.50	1.0299	1.0297	1.0295	1.0293	1.0291	1.0290	1.0288	1.0286	1.0284	1.0283	1.0281
-4.25	1.0295	1.0293	1.0291	1.0289	1.0288	1.0286	1.0284	1.0282	1.0281	1.0279	1.0277
-4.00	1.0291	1.0289	1.0288	1.0286	1.0284	1.0282	1.0280	1.0279	1.0277	1.0275	1.0274
-3.75	1.0287	1.0286	1.0284	1.0282	1.0280	1.0279	1.0277	1.0275	1.0273	1.0272	1.0270
-3.50	1.0284	1.0282	1.0280	1.0278	1.0277	1.0275	1.0273	1.0271	1.0270	1.0268	1.0267
-3.25	1.0280	1.0278	1.0276	1.0275	1.0273	1.0271	1.0270	1.0268	1.0266	1.0265	1.0263
-3.00	1.0276	1.0274	1.0273	1.0271	1.0269	1.0268	1.0266	1.0264	1.0263	1.0261	1.0259
-2.75	1.0272	1.0270	1.0269	1.0267	1.0265	1.0264	1.0262	1.0261	1.0259	1.0257	1.0256
-2.50	1.0268	1.0267	1.0265	1.0263	1.0262	1.0260	1.0259	1.0257	1.0255	1.0254	1.0252
-2.25	1.0265	1.0263	1.0261	1.0260	1.0258	1.0256	1.0255	1.0253	1.0252	1.0250	1.0249
-2.00	1.0261	1.0259	1.0258	1.0256	1.0254	1.0253	1.0251	1.0250	1.0248	1.0247	1.0245
-1.75	1.0257	1.0255	1.0254	1.0252	1.0251	1.0249	1.0248	1.0246	1.0245	1.0243	1.0242
-1.50	1.0253	1.0252	1.0250	1.0248	1.0247	1.0245	1.0244	1.0242	1.0241	1.0239	1.0238
-1.25	1.0249	1.0248	1.0246	1.0245	1.0243	1.0242	1.0240	1.0239	1.0237	1.0236	1.0234
-1.00	1.0246	1.0244	1.0243	1.0241	1.0240	1.0238	1.0237	1.0235	1.0234	1.0232	1.0231
-0.75	1.0242	1.0240	1.0239	1.0237	1.0236	1.0234	1.0233	1.0231	1.0230	1.0229	1.0227
-0.50	1.0238	1.0236	1.0235	1.0234	1.0232	1.0231	1.0229	1.0228	1.0226	1.0225	1.0224
-0.25	1.0234	1.0233	1.0231	1.0230	1.0228	1.0227	1.0226	1.0224	1.0223	1.0221	1.0220

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	630.0	632.0	634.0	636.0	638.0	640.0	642.0	644.0	646.0	648.0	650.0
0.0	1.0230	1.0229	1.0227	1.0226	1.0225	1.0223	1.0222	1.0221	1.0219	1.0218	1.0216
0.25	1.0227	1.0225	1.0224	1.0222	1.0221	1.0220	1.0218	1.0217	1.0216	1.0214	1.0213
0.50	1.0223	1.0221	1.0220	1.0219	1.0217	1.0216	1.0215	1.0213	1.0212	1.0211	1.0209
0.75	1.0219	1.0218	1.0216	1.0215	1.0213	1.0212	1.0211	1.0210	1.0208	1.0207	1.0206
1.00	1.0215	1.0214	1.0212	1.0211	1.0210	1.0208	1.0207	1.0206	1.0205	1.0203	1.0202
1.25	1.0211	1.0210	1.0209	1.0207	1.0206	1.0205	1.0204	1.0202	1.0201	1.0200	1.0199
1.50	1.0207	1.0206	1.0205	1.0204	1.0202	1.0201	1.0200	1.0199	1.0197	1.0196	1.0195
1.75	1.0204	1.0202	1.0201	1.0200	1.0199	1.0197	1.0196	1.0195	1.0194	1.0193	1.0191
2.00	1.0200	1.0199	1.0197	1.0196	1.0195	1.0194	1.0192	1.0191	1.0190	1.0189	1.0188
2.25	1.0196	1.0195	1.0194	1.0192	1.0191	1.0190	1.0189	1.0188	1.0186	1.0185	1.0184
2.50	1.0192	1.0191	1.0190	1.0189	1.0187	1.0186	1.0185	1.0184	1.0183	1.0182	1.0181
2.75	1.0188	1.0187	1.0186	1.0185	1.0184	1.0183	1.0181	1.0180	1.0179	1.0178	1.0177
3.00	1.0185	1.0183	1.0182	1.0181	1.0180	1.0179	1.0178	1.0177	1.0176	1.0175	1.0173
3.25	1.0181	1.0180	1.0178	1.0177	1.0176	1.0175	1.0174	1.0173	1.0172	1.0171	1.0170
3.50	1.0177	1.0176	1.0175	1.0174	1.0173	1.0171	1.0170	1.0169	1.0168	1.0167	1.0166
3.75	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165	1.0164	1.0163
4.00	1.0169	1.0168	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160	1.0159
4.25	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160	1.0159	1.0158	1.0157	1.0156	1.0155
4.50	1.0162	1.0161	1.0160	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154	1.0153	1.0152
4.75	1.0158	1.0157	1.0156	1.0155	1.0154	1.0153	1.0152	1.0151	1.0150	1.0149	1.0148
5.00	1.0154	1.0153	1.0152	1.0151	1.0150	1.0149	1.0148	1.0147	1.0146	1.0146	1.0145
5.25	1.0150	1.0149	1.0148	1.0147	1.0146	1.0145	1.0145	1.0144	1.0143	1.0142	1.0141
5.50	1.0146	1.0145	1.0144	1.0144	1.0143	1.0142	1.0141	1.0140	1.0139	1.0138	1.0137
5.75	1.0142	1.0142	1.0141	1.0140	1.0139	1.0138	1.0137	1.0136	1.0136	1.0135	1.0134
6.00	1.0139	1.0138	1.0137	1.0136	1.0135	1.0134	1.0134	1.0133	1.0132	1.0131	1.0130
6.25	1.0135	1.0134	1.0133	1.0132	1.0131	1.0131	1.0130	1.0129	1.0128	1.0127	1.0127
6.50	1.0131	1.0130	1.0129	1.0129	1.0128	1.0127	1.0126	1.0125	1.0125	1.0124	1.0123
6.75	1.0127	1.0126	1.0126	1.0125	1.0124	1.0123	1.0122	1.0122	1.0121	1.0120	1.0119
7.00	1.0123	1.0123	1.0122	1.0121	1.0120	1.0119	1.0119	1.0118	1.0117	1.0117	1.0116
7.25	1.0119	1.0119	1.0118	1.0117	1.0116	1.0116	1.0115	1.0114	1.0114	1.0113	1.0112
7.50	1.0116	1.0115	1.0114	1.0113	1.0113	1.0112	1.0111	1.0111	1.0110	1.0109	1.0109
7.75	1.0112	1.0111	1.0110	1.0110	1.0109	1.0108	1.0108	1.0107	1.0106	1.0106	1.0105
8.00	1.0108	1.0107	1.0107	1.0106	1.0105	1.0105	1.0104	1.0103	1.0103	1.0102	1.0101
8.25	1.0104	1.0103	1.0103	1.0102	1.0101	1.0101	1.0100	1.0100	1.0099	1.0098	1.0098
8.50	1.0100	1.0100	1.0099	1.0098	1.0098	1.0097	1.0097	1.0096	1.0095	1.0095	1.0094

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	630.0	632.0	634.0	636.0	638.0	640.0	642.0	644.0	646.0	648.0	650.0
8.75	1.0096	1.0096	1.0095	1.0095	1.0094	1.0093	1.0093	1.0092	1.0092	1.0091	1.0091
9.00	1.0093	1.0092	1.0091	1.0091	1.0090	1.0090	1.0089	1.0089	1.0088	1.0087	1.0087
9.25	1.0089	1.0088	1.0088	1.0087	1.0087	1.0086	1.0085	1.0085	1.0084	1.0084	1.0083
9.50	1.0085	1.0084	1.0084	1.0083	1.0083	1.0082	1.0082	1.0081	1.0081	1.0080	1.0080
9.75	1.0081	1.0080	1.0080	1.0079	1.0079	1.0079	1.0078	1.0078	1.0077	1.0077	1.0076
10.00	1.0077	1.0077	1.0076	1.0076	1.0075	1.0075	1.0074	1.0074	1.0073	1.0073	1.0072
10.25	1.0073	1.0073	1.0072	1.0072	1.0071	1.0071	1.0071	1.0070	1.0070	1.0069	1.0069
10.50	1.0069	1.0069	1.0069	1.0068	1.0068	1.0067	1.0067	1.0066	1.0066	1.0066	1.0065
10.75	1.0066	1.0065	1.0065	1.0064	1.0064	1.0064	1.0063	1.0063	1.0062	1.0062	1.0062
11.00	1.0062	1.0061	1.0061	1.0061	1.0060	1.0060	1.0059	1.0059	1.0059	1.0058	1.0058
11.25	1.0058	1.0058	1.0057	1.0057	1.0056	1.0056	1.0056	1.0055	1.0055	1.0055	1.0054
11.50	1.0054	1.0054	1.0053	1.0053	1.0053	1.0052	1.0052	1.0052	1.0051	1.0051	1.0051
11.75	1.0050	1.0050	1.0050	1.0049	1.0049	1.0049	1.0048	1.0048	1.0048	1.0047	1.0047
12.00	1.0046	1.0046	1.0046	1.0045	1.0045	1.0045	1.0045	1.0044	1.0044	1.0044	1.0044
12.25	1.0042	1.0042	1.0042	1.0042	1.0041	1.0041	1.0041	1.0041	1.0040	1.0040	1.0040
12.50	1.0039	1.0038	1.0038	1.0038	1.0038	1.0037	1.0037	1.0037	1.0037	1.0037	1.0036
12.75	1.0035	1.0035	1.0034	1.0034	1.0034	1.0034	1.0033	1.0033	1.0033	1.0033	1.0033
13.00	1.0031	1.0031	1.0031	1.0030	1.0030	1.0030	1.0030	1.0030	1.0029	1.0029	1.0029
13.25	1.0027	1.0027	1.0027	1.0027	1.0026	1.0026	1.0026	1.0026	1.0026	1.0026	1.0025
13.50	1.0023	1.0023	1.0023	1.0023	1.0023	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022
13.75	1.0019	1.0019	1.0019	1.0019	1.0019	1.0019	1.0019	1.0018	1.0018	1.0018	1.0018
14.00	1.0015	1.0015	1.0015	1.0015	1.0015	1.0015	1.0015	1.0015	1.0015	1.0015	1.0015
14.25	1.0012	1.0012	1.0011	1.0011	1.0011	1.0011	1.0011	1.0011	1.0011	1.0011	1.0011
14.50	1.0008	1.0008	1.0008	1.0008	1.0008	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007
14.75	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004
15.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
15.25	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996
15.50	0.9992	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993
15.75	0.9988	0.9988	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989
16.00	0.9985	0.9985	0.9985	0.9985	0.9985	0.9985	0.9985	0.9985	0.9985	0.9985	0.9985
16.25	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981	0.9982	0.9982	0.9982
16.50	0.9977	0.9977	0.9977	0.9977	0.9977	0.9977	0.9978	0.9978	0.9978	0.9978	0.9978
16.75	0.9973	0.9973	0.9973	0.9973	0.9974	0.9974	0.9974	0.9974	0.9974	0.9974	0.9975
17.00	0.9969	0.9969	0.9969	0.9970	0.9970	0.9970	0.9970	0.9970	0.9971	0.9971	0.9971
17.25	0.9965	0.9965	0.9966	0.9966	0.9966	0.9966	0.9966	0.9967	0.9967	0.9967	0.9967

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	630.0	632.0	634.0	636.0	638.0	640.0	642.0	644.0	646.0	648.0	650.0
17.50	0.9961	0.9962	0.9962	0.9962	0.9962	0.9962	0.9963	0.9963	0.9963	0.9963	0.9964
17.75	0.9957	0.9958	0.9958	0.9958	0.9958	0.9959	0.9959	0.9959	0.9959	0.9960	0.9960
18.00	0.9954	0.9954	0.9954	0.9954	0.9955	0.9955	0.9955	0.9956	0.9956	0.9956	0.9956
18.25	0.9950	0.9950	0.9950	0.9951	0.9951	0.9951	0.9952	0.9952	0.9952	0.9952	0.9953
18.50	0.9946	0.9946	0.9946	0.9947	0.9947	0.9947	0.9948	0.9948	0.9948	0.9949	0.9949
18.75	0.9942	0.9942	0.9943	0.9943	0.9943	0.9944	0.9944	0.9944	0.9945	0.9945	0.9945
19.00	0.9938	0.9938	0.9939	0.9939	0.9940	0.9940	0.9940	0.9941	0.9941	0.9941	0.9942
19.25	0.9934	0.9935	0.9935	0.9935	0.9936	0.9936	0.9937	0.9937	0.9937	0.9938	0.9938
19.50	0.9930	0.9931	0.9931	0.9932	0.9932	0.9932	0.9933	0.9933	0.9934	0.9934	0.9934
19.75	0.9926	0.9927	0.9927	0.9928	0.9928	0.9929	0.9929	0.9930	0.9930	0.9930	0.9931
20.00	0.9922	0.9923	0.9923	0.9924	0.9924	0.9925	0.9925	0.9926	0.9926	0.9927	0.9927
温度 ℃	15℃时密度, kg/m ³										
	650.0	652.0	654.0	656.0	658.0	660.0	662.0	664.0	666.0	668.0	670.0
-20.00	—	—	—	—	—	—	—	—	—	—	—
-19.75	—	—	—	—	—	—	—	—	—	—	—
-19.50	—	—	—	—	—	—	—	—	—	—	—
-19.25	—	—	—	—	—	—	—	—	—	—	—
-19.00	—	—	—	—	—	—	—	—	—	—	—
-18.75	—	—	—	—	—	—	—	—	—	—	—
-18.50	—	—	—	—	—	—	—	—	—	—	—
-18.25	—	—	—	—	—	—	—	—	—	—	—
-18.00	1.0472	1.0469	1.0466	1.0463	1.0461	1.0458	1.0455	1.0453	1.0450	1.0447	1.0445
-17.75	1.0468	1.0466	1.0463	1.0460	1.0457	1.0455	1.0452	1.0449	1.0447	1.0444	1.0441
-17.50	1.0465	1.0462	1.0459	1.0457	1.0454	1.0451	1.0449	1.0446	1.0443	1.0441	1.0438
-17.25	1.0461	1.0459	1.0456	1.0453	1.0450	1.0448	1.0445	1.0442	1.0440	1.0437	1.0435
-17.00	1.0458	1.0455	1.0452	1.0450	1.0447	1.0444	1.0442	1.0439	1.0437	1.0434	1.0431
-16.75	1.0454	1.0452	1.0449	1.0446	1.0444	1.0441	1.0438	1.0436	1.0433	1.0431	1.0428
-16.50	1.0451	1.0448	1.0445	1.0443	1.0440	1.0438	1.0435	1.0432	1.0430	1.0427	1.0425
-16.25	1.0447	1.0445	1.0442	1.0439	1.0437	1.0434	1.0432	1.0429	1.0426	1.0424	1.0421
-16.00	1.0444	1.0441	1.0439	1.0436	1.0433	1.0431	1.0428	1.0426	1.0423	1.0421	1.0418
-15.75	1.0440	1.0438	1.0435	1.0432	1.0430	1.0427	1.0425	1.0422	1.0420	1.0417	1.0415
-15.50	1.0437	1.0434	1.0432	1.0429	1.0426	1.0424	1.0421	1.0419	1.0416	1.0414	1.0411
-15.25	1.0433	1.0431	1.0428	1.0425	1.0423	1.0420	1.0418	1.0415	1.0413	1.0411	1.0408

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	650.0	652.0	654.0	656.0	658.0	660.0	662.0	664.0	666.0	668.0	670.0
-15.00	1.0430	1.0427	1.0425	1.0422	1.0420	1.0417	1.0415	1.0412	1.0410	1.0407	1.0405
-14.75	1.0426	1.0424	1.0421	1.0419	1.0416	1.0414	1.0411	1.0409	1.0406	1.0404	1.0401
-14.50	1.0423	1.0420	1.0418	1.0415	1.0413	1.0410	1.0408	1.0405	1.0403	1.0401	1.0398
-14.25	1.0419	1.0417	1.0414	1.0412	1.0409	1.0407	1.0404	1.0402	1.0400	1.0397	1.0395
-14.00	1.0416	1.0413	1.0411	1.0408	1.0406	1.0403	1.0401	1.0399	1.0396	1.0394	1.0392
-13.75	1.0412	1.0410	1.0407	1.0405	1.0402	1.0400	1.0398	1.0395	1.0393	1.0390	1.0388
-13.50	1.0409	1.0406	1.0404	1.0401	1.0399	1.0396	1.0394	1.0392	1.0389	1.0387	1.0385
-13.25	1.0405	1.0403	1.0400	1.0398	1.0395	1.0393	1.0391	1.0388	1.0386	1.0384	1.0382
-13.00	1.0402	1.0399	1.0397	1.0394	1.0392	1.0390	1.0387	1.0385	1.0383	1.0380	1.0378
-12.75	1.0398	1.0396	1.0393	1.0391	1.0388	1.0386	1.0384	1.0382	1.0379	1.0377	1.0375
-12.50	1.0394	1.0392	1.0390	1.0387	1.0385	1.0383	1.0380	1.0378	1.0376	1.0374	1.0372
-12.25	1.0391	1.0389	1.0386	1.0384	1.0382	1.0379	1.0377	1.0375	1.0373	1.0370	1.0368
-12.00	1.0387	1.0385	1.0383	1.0380	1.0378	1.0376	1.0374	1.0371	1.0369	1.0367	1.0365
-11.75	1.0384	1.0382	1.0379	1.0377	1.0375	1.0372	1.0370	1.0368	1.0366	1.0364	1.0362
-11.50	1.0380	1.0378	1.0376	1.0373	1.0371	1.0369	1.0367	1.0365	1.0362	1.0360	1.0358
-11.25	1.0377	1.0374	1.0372	1.0370	1.0368	1.0366	1.0363	1.0361	1.0359	1.0357	1.0355
-11.00	1.0373	1.0371	1.0369	1.0366	1.0364	1.0362	1.0360	1.0358	1.0356	1.0354	1.0352
-10.75	1.0370	1.0367	1.0365	1.0363	1.0361	1.0359	1.0357	1.0354	1.0352	1.0350	1.0348
-10.50	1.0366	1.0364	1.0362	1.0360	1.0357	1.0355	1.0353	1.0351	1.0349	1.0347	1.0345
-10.25	1.0363	1.0360	1.0358	1.0356	1.0354	1.0352	1.0350	1.0348	1.0346	1.0344	1.0342
-10.00	1.0359	1.0357	1.0355	1.0353	1.0350	1.0348	1.0346	1.0344	1.0342	1.0340	1.0338
-9.75	1.0355	1.0353	1.0351	1.0349	1.0347	1.0345	1.0343	1.0341	1.0339	1.0337	1.0335
-9.50	1.0352	1.0350	1.0348	1.0346	1.0344	1.0341	1.0339	1.0337	1.0335	1.0333	1.0331
-9.25	1.0348	1.0346	1.0344	1.0342	1.0340	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328
-9.00	1.0345	1.0343	1.0341	1.0339	1.0337	1.0335	1.0333	1.0331	1.0329	1.0327	1.0325
-8.75	1.0341	1.0339	1.0337	1.0335	1.0333	1.0331	1.0329	1.0327	1.0325	1.0323	1.0321
-8.50	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320	1.0318
-8.25	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320	1.0319	1.0317	1.0315
-8.00	1.0331	1.0329	1.0327	1.0325	1.0323	1.0321	1.0319	1.0317	1.0315	1.0313	1.0311
-7.75	1.0327	1.0325	1.0323	1.0321	1.0319	1.0317	1.0315	1.0314	1.0312	1.0310	1.0308
-7.50	1.0324	1.0322	1.0320	1.0318	1.0316	1.0314	1.0312	1.0310	1.0308	1.0307	1.0305
-7.25	1.0320	1.0318	1.0316	1.0314	1.0312	1.0310	1.0309	1.0307	1.0305	1.0303	1.0301
-7.00	1.0316	1.0315	1.0313	1.0311	1.0309	1.0307	1.0305	1.0303	1.0302	1.0300	1.0298
-6.75	1.0313	1.0311	1.0309	1.0307	1.0305	1.0304	1.0302	1.0300	1.0298	1.0296	1.0295
-6.50	1.0309	1.0307	1.0306	1.0304	1.0302	1.0300	1.0298	1.0297	1.0295	1.0293	1.0291

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	650.0	652.0	654.0	656.0	658.0	660.0	662.0	664.0	666.0	668.0	670.0
-6.25	1.0306	1.0304	1.0302	1.0300	1.0298	1.0297	1.0295	1.0293	1.0291	1.0290	1.0288
-6.00	1.0302	1.0300	1.0299	1.0297	1.0295	1.0293	1.0291	1.0290	1.0288	1.0286	1.0285
-5.75	1.0299	1.0297	1.0295	1.0293	1.0291	1.0290	1.0288	1.0286	1.0285	1.0283	1.0281
-5.50	1.0295	1.0293	1.0292	1.0290	1.0288	1.0286	1.0285	1.0283	1.0281	1.0280	1.0278
-5.25	1.0292	1.0290	1.0288	1.0286	1.0285	1.0283	1.0281	1.0279	1.0278	1.0276	1.0275
-5.00	1.0288	1.0286	1.0284	1.0283	1.0281	1.0279	1.0278	1.0276	1.0274	1.0273	1.0271
-4.75	1.0284	1.0283	1.0281	1.0279	1.0278	1.0276	1.0274	1.0273	1.0271	1.0269	1.0268
-4.50	1.0281	1.0279	1.0277	1.0276	1.0274	1.0272	1.0271	1.0269	1.0268	1.0266	1.0264
-4.25	1.0277	1.0276	1.0274	1.0272	1.0271	1.0269	1.0267	1.0266	1.0264	1.0263	1.0261
-4.00	1.0274	1.0272	1.0270	1.0269	1.0267	1.0266	1.0264	1.0262	1.0261	1.0259	1.0258
-3.75	1.0270	1.0268	1.0267	1.0265	1.0264	1.0262	1.0261	1.0259	1.0257	1.0256	1.0254
-3.50	1.0267	1.0265	1.0263	1.0262	1.0260	1.0259	1.0257	1.0256	1.0254	1.0252	1.0251
-3.25	1.0263	1.0261	1.0260	1.0258	1.0257	1.0255	1.0254	1.0252	1.0251	1.0249	1.0248
-3.00	1.0259	1.0258	1.0256	1.0255	1.0253	1.0252	1.0250	1.0249	1.0247	1.0246	1.0244
-2.75	1.0256	1.0254	1.0253	1.0251	1.0250	1.0248	1.0247	1.0245	1.0244	1.0242	1.0241
-2.50	1.0252	1.0251	1.0249	1.0248	1.0246	1.0245	1.0243	1.0242	1.0240	1.0239	1.0238
-2.25	1.0249	1.0247	1.0246	1.0244	1.0243	1.0241	1.0240	1.0238	1.0237	1.0236	1.0234
-2.00	1.0245	1.0244	1.0242	1.0241	1.0239	1.0238	1.0236	1.0235	1.0234	1.0232	1.0231
-1.75	1.0242	1.0240	1.0239	1.0237	1.0236	1.0234	1.0233	1.0232	1.0230	1.0229	1.0227
-1.50	1.0238	1.0237	1.0235	1.0234	1.0232	1.0231	1.0229	1.0228	1.0227	1.0225	1.0224
-1.25	1.0234	1.0233	1.0232	1.0230	1.0229	1.0227	1.0226	1.0225	1.0223	1.0222	1.0221
-1.00	1.0231	1.0229	1.0228	1.0227	1.0225	1.0224	1.0223	1.0221	1.0220	1.0219	1.0217
-0.75	1.0227	1.0226	1.0224	1.0223	1.0222	1.0220	1.0219	1.0218	1.0217	1.0215	1.0214
-0.50	1.0224	1.0222	1.0221	1.0220	1.0218	1.0217	1.0216	1.0214	1.0213	1.0212	1.0211
-0.25	1.0220	1.0219	1.0217	1.0216	1.0215	1.0213	1.0212	1.0211	1.0210	1.0208	1.0207
0.0	1.0216	1.0215	1.0214	1.0213	1.0211	1.0210	1.0209	1.0208	1.0206	1.0205	1.0204
0.25	1.0213	1.0212	1.0210	1.0209	1.0208	1.0207	1.0205	1.0204	1.0203	1.0202	1.0200
0.50	1.0209	1.0208	1.0207	1.0206	1.0204	1.0203	1.0202	1.0201	1.0199	1.0198	1.0197
0.75	1.0206	1.0204	1.0203	1.0202	1.0201	1.0200	1.0198	1.0197	1.0196	1.0195	1.0194
1.00	1.0202	1.0201	1.0200	1.0198	1.0197	1.0196	1.0195	1.0194	1.0193	1.0191	1.0190
1.25	1.0199	1.0197	1.0196	1.0195	1.0194	1.0193	1.0191	1.0190	1.0189	1.0188	1.0187
1.50	1.0195	1.0194	1.0193	1.0191	1.0190	1.0189	1.0188	1.0187	1.0186	1.0185	1.0184
1.75	1.0191	1.0190	1.0189	1.0188	1.0187	1.0186	1.0185	1.0183	1.0182	1.0181	1.0180
2.00	1.0188	1.0187	1.0186	1.0184	1.0183	1.0182	1.0181	1.0180	1.0179	1.0178	1.0177
2.25	1.0184	1.0183	1.0182	1.0181	1.0180	1.0179	1.0178	1.0177	1.0176	1.0174	1.0173

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	650.0	652.0	654.0	656.0	658.0	660.0	662.0	664.0	666.0	668.0	670.0
2.50	1.0181	1.0180	1.0178	1.0177	1.0176	1.0175	1.0174	1.0173	1.0172	1.0171	1.0170
2.75	1.0177	1.0176	1.0175	1.0174	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168	1.0167
3.00	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165	1.0164	1.0163
3.25	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160
3.50	1.0166	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160	1.0159	1.0158	1.0157	1.0157
3.75	1.0163	1.0162	1.0161	1.0160	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154	1.0153
4.00	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154	1.0153	1.0152	1.0152	1.0151	1.0150
4.25	1.0155	1.0155	1.0154	1.0153	1.0152	1.0151	1.0150	1.0149	1.0148	1.0147	1.0146
4.50	1.0152	1.0151	1.0150	1.0149	1.0148	1.0147	1.0146	1.0146	1.0145	1.0144	1.0143
4.75	1.0148	1.0147	1.0146	1.0146	1.0145	1.0144	1.0143	1.0142	1.0141	1.0140	1.0140
5.00	1.0145	1.0144	1.0143	1.0142	1.0141	1.0140	1.0139	1.0139	1.0138	1.0137	1.0136
5.25	1.0141	1.0140	1.0139	1.0139	1.0138	1.0137	1.0136	1.0135	1.0134	1.0134	1.0133
5.50	1.0137	1.0137	1.0136	1.0135	1.0134	1.0133	1.0133	1.0132	1.0131	1.0130	1.0129
5.75	1.0134	1.0133	1.0132	1.0131	1.0131	1.0130	1.0129	1.0128	1.0128	1.0127	1.0126
6.00	1.0130	1.0129	1.0129	1.0128	1.0127	1.0126	1.0126	1.0125	1.0124	1.0123	1.0123
6.25	1.0127	1.0126	1.0125	1.0124	1.0124	1.0123	1.0122	1.0121	1.0121	1.0120	1.0119
6.50	1.0123	1.0122	1.0122	1.0121	1.0120	1.0119	1.0119	1.0118	1.0117	1.0117	1.0116
6.75	1.0119	1.0119	1.0118	1.0117	1.0117	1.0116	1.0115	1.0114	1.0114	1.0113	1.0112
7.00	1.0116	1.0115	1.0114	1.0114	1.0113	1.0112	1.0112	1.0111	1.0110	1.0110	1.0109
7.25	1.0112	1.0112	1.0111	1.0110	1.0110	1.0109	1.0108	1.0108	1.0107	1.0106	1.0106
7.50	1.0109	1.0108	1.0107	1.0107	1.0106	1.0105	1.0105	1.0104	1.0103	1.0103	1.0102
7.75	1.0105	1.0104	1.0104	1.0103	1.0102	1.0102	1.0101	1.0101	1.0100	1.0099	1.0099
8.00	1.0101	1.0101	1.0100	1.0100	1.0099	1.0098	1.0098	1.0097	1.0097	1.0096	1.0095
8.25	1.0098	1.0097	1.0097	1.0096	1.0095	1.0095	1.0094	1.0094	1.0093	1.0093	1.0092
8.50	1.0094	1.0094	1.0093	1.0092	1.0092	1.0091	1.0091	1.0090	1.0090	1.0089	1.0089
8.75	1.0091	1.0090	1.0089	1.0089	1.0088	1.0088	1.0087	1.0087	1.0086	1.0086	1.0085
9.00	1.0087	1.0086	1.0086	1.0085	1.0085	1.0084	1.0084	1.0083	1.0083	1.0082	1.0082
9.25	1.0083	1.0083	1.0082	1.0082	1.0081	1.0081	1.0080	1.0080	1.0079	1.0079	1.0078
9.50	1.0080	1.0079	1.0079	1.0078	1.0078	1.0077	1.0077	1.0076	1.0076	1.0076	1.0075
9.75	1.0076	1.0076	1.0075	1.0075	1.0074	1.0074	1.0073	1.0073	1.0073	1.0072	1.0072
10.00	1.0072	1.0072	1.0072	1.0071	1.0071	1.0070	1.0070	1.0069	1.0069	1.0069	1.0068
10.25	1.0069	1.0068	1.0068	1.0068	1.0067	1.0067	1.0066	1.0066	1.0066	1.0065	1.0065
10.50	1.0065	1.0065	1.0064	1.0064	1.0064	1.0063	1.0063	1.0063	1.0062	1.0062	1.0061
10.75	1.0062	1.0061	1.0061	1.0061	1.0060	1.0060	1.0059	1.0059	1.0059	1.0058	1.0058
11.00	1.0058	1.0058	1.0057	1.0057	1.0057	1.0056	1.0056	1.0056	1.0055	1.0055	1.0055

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	650.0	652.0	654.0	656.0	658.0	660.0	662.0	664.0	666.0	668.0	670.0
11.25	1.0054	1.0054	1.0054	1.0053	1.0053	1.0053	1.0052	1.0052	1.0052	1.0052	1.0051
11.50	1.0051	1.0050	1.0050	1.0050	1.0050	1.0049	1.0049	1.0049	1.0048	1.0048	1.0048
11.75	1.0047	1.0047	1.0047	1.0046	1.0046	1.0046	1.0045	1.0045	1.0045	1.0045	1.0044
12.00	1.0044	1.0043	1.0043	1.0043	1.0042	1.0042	1.0042	1.0042	1.0041	1.0041	1.0041
12.25	1.0040	1.0040	1.0039	1.0039	1.0039	1.0039	1.0038	1.0038	1.0038	1.0038	1.0038
12.50	1.0036	1.0036	1.0036	1.0036	1.0035	1.0035	1.0035	1.0035	1.0035	1.0034	1.0034
12.75	1.0033	1.0032	1.0032	1.0032	1.0032	1.0032	1.0031	1.0031	1.0031	1.0031	1.0031
13.00	1.0029	1.0029	1.0029	1.0029	1.0028	1.0028	1.0028	1.0028	1.0028	1.0027	1.0027
13.25	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0024	1.0024	1.0024	1.0024	1.0024
13.50	1.0022	1.0022	1.0022	1.0021	1.0021	1.0021	1.0021	1.0021	1.0021	1.0021	1.0021
13.75	1.0018	1.0018	1.0018	1.0018	1.0018	1.0018	1.0018	1.0017	1.0017	1.0017	1.0017
14.00	1.0015	1.0014	1.0014	1.0014	1.0014	1.0014	1.0014	1.0014	1.0014	1.0014	1.0014
14.25	1.0011	1.0011	1.0011	1.0011	1.0011	1.0011	1.0011	1.0010	1.0010	1.0010	1.0010
14.50	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007
14.75	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0004	1.0003	1.0003	1.0003	1.0003
15.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
15.25	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997	0.9997	0.9997	0.9997
15.50	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993
15.75	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989	0.9990	0.9990	0.9990	0.9990
16.00	0.9985	0.9986	0.9986	0.9986	0.9986	0.9986	0.9986	0.9986	0.9986	0.9986	0.9986
16.25	0.9982	0.9982	0.9982	0.9982	0.9982	0.9982	0.9982	0.9983	0.9983	0.9983	0.9983
16.50	0.9978	0.9978	0.9978	0.9979	0.9979	0.9979	0.9979	0.9979	0.9979	0.9979	0.9979
16.75	0.9975	0.9975	0.9975	0.9975	0.9975	0.9975	0.9975	0.9976	0.9976	0.9976	0.9976
17.00	0.9971	0.9971	0.9971	0.9971	0.9972	0.9972	0.9972	0.9972	0.9972	0.9972	0.9973
17.25	0.9967	0.9967	0.9968	0.9968	0.9968	0.9968	0.9968	0.9969	0.9969	0.9969	0.9969
17.50	0.9964	0.9964	0.9964	0.9964	0.9965	0.9965	0.9965	0.9965	0.9965	0.9966	0.9966
17.75	0.9960	0.9960	0.9960	0.9961	0.9961	0.9961	0.9961	0.9962	0.9962	0.9962	0.9962
18.00	0.9956	0.9957	0.9957	0.9957	0.9957	0.9958	0.9958	0.9958	0.9958	0.9959	0.9959
18.25	0.9953	0.9953	0.9953	0.9954	0.9954	0.9954	0.9954	0.9955	0.9955	0.9955	0.9955
18.50	0.9949	0.9949	0.9950	0.9950	0.9950	0.9951	0.9951	0.9951	0.9951	0.9952	0.9952
18.75	0.9945	0.9946	0.9946	0.9946	0.9947	0.9947	0.9947	0.9948	0.9948	0.9948	0.9949
19.00	0.9942	0.9942	0.9942	0.9943	0.9943	0.9944	0.9944	0.9944	0.9945	0.9945	0.9945
19.25	0.9938	0.9939	0.9939	0.9939	0.9940	0.9940	0.9940	0.9941	0.9941	0.9941	0.9942
19.50	0.9934	0.9935	0.9935	0.9936	0.9936	0.9936	0.9937	0.9937	0.9938	0.9938	0.9938
19.75	0.9931	0.9931	0.9932	0.9932	0.9933	0.9933	0.9933	0.9934	0.9934	0.9935	0.9935
20.00	0.9927	0.9928	0.9928	0.9929	0.9929	0.9929	0.9930	0.9930	0.9931	0.9931	0.9931

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	670.0	672.0	674.0	676.0	678.0	680.0	682.0	684.0	686.0	688.0	690.0
-20.00	—	—	—	—	—	—	—	—	—	—	—
-19.75	—	—	—	—	—	—	—	—	—	—	—
-19.50	—	—	—	—	—	—	—	—	—	—	—
-19.25	—	—	—	—	—	—	—	—	—	—	—
-19.00	—	—	—	—	—	—	—	—	—	—	—
-18.75	—	—	—	—	—	—	—	—	—	—	—
-18.50	—	—	—	—	—	—	—	—	—	—	—
-18.25	—	—	—	—	—	—	—	—	—	—	—
-18.00	1.0445	1.0442	1.0439	1.0437	1.0434	1.0432	1.0429	1.0427	1.0424	1.0422	1.0420
-17.75	1.0441	1.0439	1.0436	1.0434	1.0431	1.0429	1.0426	1.0424	1.0421	1.0419	1.0417
-17.50	1.0438	1.0435	1.0433	1.0430	1.0428	1.0425	1.0423	1.0421	1.0418	1.0416	1.0413
-17.25	1.0435	1.0432	1.0430	1.0427	1.0425	1.0422	1.0420	1.0417	1.0415	1.0413	1.0410
-17.00	1.0431	1.0429	1.0426	1.0424	1.0421	1.0419	1.0417	1.0414	1.0412	1.0409	1.0407
-16.75	1.0428	1.0426	1.0423	1.0421	1.0418	1.0416	1.0413	1.0411	1.0409	1.0406	1.0404
-16.50	1.0425	1.0422	1.0420	1.0417	1.0415	1.0413	1.0410	1.0408	1.0405	1.0403	1.0401
-16.25	1.0421	1.0419	1.0417	1.0414	1.0412	1.0409	1.0407	1.0405	1.0402	1.0400	1.0398
-16.00	1.0418	1.0416	1.0413	1.0411	1.0408	1.0406	1.0404	1.0401	1.0399	1.0397	1.0395
-15.75	1.0415	1.0412	1.0410	1.0408	1.0405	1.0403	1.0401	1.0398	1.0396	1.0394	1.0391
-15.50	1.0411	1.0409	1.0407	1.0404	1.0402	1.0400	1.0397	1.0395	1.0393	1.0391	1.0388
-15.25	1.0408	1.0406	1.0403	1.0401	1.0399	1.0396	1.0394	1.0392	1.0390	1.0387	1.0385
-15.00	1.0405	1.0402	1.0400	1.0398	1.0395	1.0393	1.0391	1.0389	1.0386	1.0384	1.0382
-14.75	1.0401	1.0399	1.0397	1.0395	1.0392	1.0390	1.0388	1.0385	1.0383	1.0381	1.0379
-14.50	1.0398	1.0396	1.0394	1.0391	1.0389	1.0387	1.0384	1.0382	1.0380	1.0378	1.0376
-14.25	1.0395	1.0393	1.0390	1.0388	1.0386	1.0383	1.0381	1.0379	1.0377	1.0375	1.0373
-14.00	1.0392	1.0389	1.0387	1.0385	1.0382	1.0380	1.0378	1.0376	1.0374	1.0372	1.0369
-13.75	1.0388	1.0386	1.0384	1.0381	1.0379	1.0377	1.0375	1.0373	1.0371	1.0368	1.0366
-13.50	1.0385	1.0383	1.0380	1.0378	1.0376	1.0374	1.0372	1.0369	1.0367	1.0365	1.0363
-13.25	1.0382	1.0379	1.0377	1.0375	1.0373	1.0371	1.0368	1.0366	1.0364	1.0362	1.0360
-13.00	1.0378	1.0376	1.0374	1.0372	1.0369	1.0367	1.0365	1.0363	1.0361	1.0359	1.0357
-12.75	1.0375	1.0373	1.0370	1.0368	1.0366	1.0364	1.0362	1.0360	1.0358	1.0356	1.0354
-12.50	1.0372	1.0369	1.0367	1.0365	1.0363	1.0361	1.0359	1.0357	1.0355	1.0353	1.0351
-12.25	1.0368	1.0366	1.0364	1.0362	1.0360	1.0358	1.0356	1.0353	1.0351	1.0349	1.0347
-12.00	1.0365	1.0363	1.0361	1.0359	1.0356	1.0354	1.0352	1.0350	1.0348	1.0346	1.0344
-11.75	1.0362	1.0359	1.0357	1.0355	1.0353	1.0351	1.0349	1.0347	1.0345	1.0343	1.0341
-11.50	1.0358	1.0356	1.0354	1.0352	1.0350	1.0348	1.0346	1.0344	1.0342	1.0340	1.0338

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	670.0	672.0	674.0	676.0	678.0	680.0	682.0	684.0	686.0	688.0	690.0
-11.25	1.0355	1.0353	1.0351	1.0349	1.0347	1.0345	1.0343	1.0341	1.0339	1.0337	1.0335
-11.00	1.0352	1.0349	1.0347	1.0345	1.0343	1.0341	1.0339	1.0337	1.0336	1.0334	1.0332
-10.75	1.0348	1.0346	1.0344	1.0342	1.0340	1.0338	1.0336	1.0334	1.0332	1.0330	1.0329
-10.50	1.0345	1.0343	1.0341	1.0339	1.0337	1.0335	1.0333	1.0331	1.0329	1.0327	1.0325
-10.25	1.0342	1.0340	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322
-10.00	1.0338	1.0336	1.0334	1.0332	1.0330	1.0328	1.0327	1.0325	1.0323	1.0321	1.0319
-9.75	1.0335	1.0333	1.0331	1.0329	1.0327	1.0325	1.0323	1.0321	1.0320	1.0318	1.0316
-9.50	1.0331	1.0330	1.0328	1.0326	1.0324	1.0322	1.0320	1.0318	1.0316	1.0315	1.0313
-9.25	1.0328	1.0326	1.0324	1.0322	1.0321	1.0319	1.0317	1.0315	1.0313	1.0311	1.0310
-9.00	1.0325	1.0323	1.0321	1.0319	1.0317	1.0315	1.0314	1.0312	1.0310	1.0308	1.0306
-8.75	1.0321	1.0320	1.0318	1.0316	1.0314	1.0312	1.0310	1.0309	1.0307	1.0305	1.0303
-8.50	1.0318	1.0316	1.0314	1.0313	1.0311	1.0309	1.0307	1.0305	1.0304	1.0302	1.0300
-8.25	1.0315	1.0313	1.0311	1.0309	1.0307	1.0306	1.0304	1.0302	1.0300	1.0299	1.0297
-8.00	1.0311	1.0310	1.0308	1.0306	1.0304	1.0302	1.0301	1.0299	1.0297	1.0295	1.0294
-7.75	1.0308	1.0306	1.0304	1.0303	1.0301	1.0299	1.0297	1.0296	1.0294	1.0292	1.0291
-7.50	1.0305	1.0303	1.0301	1.0299	1.0298	1.0296	1.0294	1.0292	1.0291	1.0289	1.0287
-7.25	1.0301	1.0300	1.0298	1.0296	1.0294	1.0293	1.0291	1.0289	1.0288	1.0286	1.0284
-7.00	1.0298	1.0296	1.0295	1.0293	1.0291	1.0289	1.0288	1.0286	1.0284	1.0283	1.0281
-6.75	1.0295	1.0293	1.0291	1.0290	1.0288	1.0286	1.0284	1.0283	1.0281	1.0280	1.0278
-6.50	1.0291	1.0290	1.0288	1.0286	1.0285	1.0283	1.0281	1.0280	1.0278	1.0276	1.0275
-6.25	1.0288	1.0286	1.0285	1.0283	1.0281	1.0280	1.0278	1.0276	1.0275	1.0273	1.0272
-6.00	1.0285	1.0283	1.0281	1.0280	1.0278	1.0276	1.0275	1.0273	1.0272	1.0270	1.0268
-5.75	1.0281	1.0280	1.0278	1.0276	1.0275	1.0273	1.0272	1.0270	1.0268	1.0267	1.0265
-5.50	1.0278	1.0276	1.0275	1.0273	1.0271	1.0270	1.0268	1.0267	1.0265	1.0264	1.0262
-5.25	1.0275	1.0273	1.0271	1.0270	1.0268	1.0267	1.0265	1.0264	1.0262	1.0260	1.0259
-5.00	1.0271	1.0270	1.0268	1.0266	1.0265	1.0263	1.0262	1.0260	1.0259	1.0257	1.0256
-4.75	1.0268	1.0266	1.0265	1.0263	1.0262	1.0260	1.0259	1.0257	1.0256	1.0254	1.0253
-4.50	1.0264	1.0263	1.0261	1.0260	1.0258	1.0257	1.0255	1.0254	1.0252	1.0251	1.0249
-4.25	1.0261	1.0260	1.0258	1.0257	1.0255	1.0254	1.0252	1.0251	1.0249	1.0248	1.0246
-4.00	1.0258	1.0256	1.0255	1.0253	1.0252	1.0250	1.0249	1.0247	1.0246	1.0245	1.0243
-3.75	1.0254	1.0253	1.0251	1.0250	1.0248	1.0247	1.0246	1.0244	1.0243	1.0241	1.0240
-3.50	1.0251	1.0250	1.0248	1.0247	1.0245	1.0244	1.0242	1.0241	1.0240	1.0238	1.0237
-3.25	1.0248	1.0246	1.0245	1.0243	1.0242	1.0240	1.0239	1.0238	1.0236	1.0235	1.0234
-3.00	1.0244	1.0243	1.0241	1.0240	1.0239	1.0237	1.0236	1.0234	1.0233	1.0232	1.0230
-2.75	1.0241	1.0239	1.0238	1.0237	1.0235	1.0234	1.0233	1.0231	1.0230	1.0229	1.0227

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	670.0	672.0	674.0	676.0	678.0	680.0	682.0	684.0	686.0	688.0	690.0
-2.50	1.0238	1.0236	1.0235	1.0233	1.0232	1.0231	1.0229	1.0228	1.0227	1.0225	1.0224
-2.25	1.0234	1.0233	1.0231	1.0230	1.0229	1.0227	1.0226	1.0225	1.0223	1.0222	1.0221
-2.00	1.0231	1.0229	1.0228	1.0227	1.0225	1.0224	1.0223	1.0222	1.0220	1.0219	1.0218
-1.75	1.0227	1.0226	1.0225	1.0223	1.0222	1.0221	1.0220	1.0218	1.0217	1.0216	1.0215
-1.50	1.0224	1.0223	1.0221	1.0220	1.0219	1.0218	1.0216	1.0215	1.0214	1.0213	1.0211
-1.25	1.0221	1.0219	1.0218	1.0217	1.0216	1.0214	1.0213	1.0212	1.0211	1.0209	1.0208
-1.00	1.0217	1.0216	1.0215	1.0214	1.0212	1.0211	1.0210	1.0209	1.0207	1.0206	1.0205
-0.75	1.0214	1.0213	1.0211	1.0210	1.0209	1.0208	1.0207	1.0205	1.0204	1.0203	1.0202
-0.50	1.0211	1.0209	1.0208	1.0207	1.0206	1.0204	1.0203	1.0202	1.0201	1.0200	1.0199
-0.25	1.0207	1.0206	1.0205	1.0204	1.0202	1.0201	1.0200	1.0199	1.0198	1.0197	1.0195
0.0	1.0204	1.0203	1.0201	1.0200	1.0199	1.0198	1.0197	1.0196	1.0195	1.0193	1.0192
0.25	1.0200	1.0199	1.0198	1.0197	1.0196	1.0195	1.0194	1.0192	1.0191	1.0190	1.0189
0.50	1.0197	1.0196	1.0195	1.0194	1.0192	1.0191	1.0190	1.0189	1.0188	1.0187	1.0186
0.75	1.0194	1.0193	1.0191	1.0190	1.0189	1.0188	1.0187	1.0186	1.0185	1.0184	1.0183
1.00	1.0190	1.0189	1.0188	1.0187	1.0186	1.0185	1.0184	1.0183	1.0182	1.0181	1.0180
1.25	1.0187	1.0186	1.0185	1.0184	1.0183	1.0182	1.0180	1.0179	1.0178	1.0177	1.0176
1.50	1.0184	1.0182	1.0181	1.0180	1.0179	1.0178	1.0177	1.0176	1.0175	1.0174	1.0173
1.75	1.0180	1.0179	1.0178	1.0177	1.0176	1.0175	1.0174	1.0173	1.0172	1.0171	1.0170
2.00	1.0177	1.0176	1.0175	1.0174	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168	1.0167
2.25	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165	1.0165	1.0164
2.50	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160
2.75	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162	1.0161	1.0160	1.0159	1.0158	1.0157
3.00	1.0163	1.0162	1.0161	1.0160	1.0159	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154
3.25	1.0160	1.0159	1.0158	1.0157	1.0156	1.0155	1.0154	1.0153	1.0153	1.0152	1.0151
3.50	1.0157	1.0156	1.0155	1.0154	1.0153	1.0152	1.0151	1.0150	1.0149	1.0148	1.0148
3.75	1.0153	1.0152	1.0151	1.0150	1.0150	1.0149	1.0148	1.0147	1.0146	1.0145	1.0144
4.00	1.0150	1.0149	1.0148	1.0147	1.0146	1.0145	1.0145	1.0144	1.0143	1.0142	1.0141
4.25	1.0146	1.0145	1.0145	1.0144	1.0143	1.0142	1.0141	1.0140	1.0140	1.0139	1.0138
4.50	1.0143	1.0142	1.0141	1.0140	1.0140	1.0139	1.0138	1.0137	1.0136	1.0136	1.0135
4.75	1.0140	1.0139	1.0138	1.0137	1.0136	1.0136	1.0135	1.0134	1.0133	1.0132	1.0132
5.00	1.0136	1.0135	1.0135	1.0134	1.0133	1.0132	1.0131	1.0131	1.0130	1.0129	1.0128
5.25	1.0133	1.0132	1.0131	1.0130	1.0130	1.0129	1.0128	1.0127	1.0127	1.0126	1.0125
5.50	1.0129	1.0129	1.0128	1.0127	1.0126	1.0126	1.0125	1.0124	1.0123	1.0123	1.0122
5.75	1.0126	1.0125	1.0125	1.0124	1.0123	1.0122	1.0122	1.0121	1.0120	1.0120	1.0119
6.00	1.0123	1.0122	1.0121	1.0120	1.0120	1.0119	1.0118	1.0118	1.0117	1.0116	1.0116

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	670.0	672.0	674.0	676.0	678.0	680.0	682.0	684.0	686.0	688.0	690.0
6.25	1.0119	1.0119	1.0118	1.0117	1.0116	1.0116	1.0115	1.0114	1.0114	1.0113	1.0112
6.50	1.0116	1.0115	1.0114	1.0114	1.0113	1.0112	1.0112	1.0111	1.0111	1.0110	1.0109
6.75	1.0112	1.0112	1.0111	1.0110	1.0110	1.0109	1.0109	1.0108	1.0107	1.0107	1.0106
7.00	1.0109	1.0108	1.0108	1.0107	1.0106	1.0106	1.0105	1.0105	1.0104	1.0103	1.0103
7.25	1.0106	1.0105	1.0104	1.0104	1.0103	1.0103	1.0102	1.0101	1.0101	1.0100	1.0100
7.50	1.0102	1.0102	1.0101	1.0100	1.0100	1.0099	1.0099	1.0098	1.0098	1.0097	1.0096
7.75	1.0099	1.0098	1.0098	1.0097	1.0097	1.0096	1.0095	1.0095	1.0094	1.0094	1.0093
8.00	1.0095	1.0095	1.0094	1.0094	1.0093	1.0093	1.0092	1.0092	1.0091	1.0091	1.0090
8.25	1.0092	1.0092	1.0091	1.0090	1.0090	1.0089	1.0089	1.0088	1.0088	1.0087	1.0087
8.50	1.0089	1.0088	1.0088	1.0087	1.0087	1.0086	1.0086	1.0085	1.0085	1.0084	1.0084
8.75	1.0085	1.0085	1.0084	1.0084	1.0083	1.0083	1.0082	1.0082	1.0081	1.0081	1.0080
9.00	1.0082	1.0081	1.0081	1.0080	1.0080	1.0079	1.0079	1.0079	1.0078	1.0078	1.0077
9.25	1.0078	1.0078	1.0078	1.0077	1.0077	1.0076	1.0076	1.0075	1.0075	1.0074	1.0074
9.50	1.0075	1.0075	1.0074	1.0074	1.0073	1.0073	1.0072	1.0072	1.0072	1.0071	1.0071
9.75	1.0072	1.0071	1.0071	1.0070	1.0070	1.0070	1.0069	1.0069	1.0068	1.0068	1.0068
10.00	1.0068	1.0068	1.0067	1.0067	1.0067	1.0066	1.0066	1.0065	1.0065	1.0065	1.0064
10.25	1.0065	1.0064	1.0064	1.0064	1.0063	1.0063	1.0063	1.0062	1.0062	1.0061	1.0061
10.50	1.0061	1.0061	1.0061	1.0060	1.0060	1.0060	1.0059	1.0059	1.0059	1.0058	1.0058
10.75	1.0058	1.0058	1.0057	1.0057	1.0057	1.0056	1.0056	1.0056	1.0055	1.0055	1.0055
11.00	1.0055	1.0054	1.0054	1.0054	1.0053	1.0053	1.0053	1.0052	1.0052	1.0052	1.0052
11.25	1.0051	1.0051	1.0051	1.0050	1.0050	1.0050	1.0049	1.0049	1.0049	1.0049	1.0048
11.50	1.0048	1.0048	1.0047	1.0047	1.0047	1.0046	1.0046	1.0046	1.0046	1.0045	1.0045
11.75	1.0044	1.0044	1.0044	1.0044	1.0043	1.0043	1.0043	1.0043	1.0042	1.0042	1.0042
12.00	1.0041	1.0041	1.0040	1.0040	1.0040	1.0040	1.0040	1.0039	1.0039	1.0039	1.0039
12.25	1.0038	1.0037	1.0037	1.0037	1.0037	1.0036	1.0036	1.0036	1.0036	1.0036	1.0035
12.50	1.0034	1.0034	1.0034	1.0034	1.0033	1.0033	1.0033	1.0033	1.0033	1.0032	1.0032
12.75	1.0031	1.0031	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0029	1.0029	1.0029
13.00	1.0027	1.0027	1.0027	1.0027	1.0027	1.0027	1.0026	1.0026	1.0026	1.0026	1.0026
13.25	1.0024	1.0024	1.0024	1.0023	1.0023	1.0023	1.0023	1.0023	1.0023	1.0023	1.0023
13.50	1.0021	1.0020	1.0020	1.0020	1.0020	1.0020	1.0020	1.0020	1.0020	1.0019	1.0019
13.75	1.0017	1.0017	1.0017	1.0017	1.0017	1.0017	1.0016	1.0016	1.0016	1.0016	1.0016
14.00	1.0014	1.0014	1.0014	1.0013	1.0013	1.0013	1.0013	1.0013	1.0013	1.0013	1.0013
14.25	1.0010	1.0010	1.0010	1.0010	1.0010	1.0010	1.0010	1.0010	1.0010	1.0010	1.0010
14.50	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0007	1.0006	1.0006
14.75	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003

续表 B1

温度 ℃	15℃时密度, kg/m ³										
	670.0	672.0	674.0	676.0	678.0	680.0	682.0	684.0	686.0	688.0	690.0
15.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
15.25	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997
15.50	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9993	0.9994	0.9994
15.75	0.9990	0.9990	0.9990	0.9990	0.9990	0.9990	0.9990	0.9990	0.9990	0.9990	0.9990
16.00	0.9986	0.9986	0.9986	0.9987	0.9987	0.9987	0.9987	0.9987	0.9987	0.9987	0.9987
16.25	0.9983	0.9983	0.9983	0.9983	0.9983	0.9983	0.9983	0.9984	0.9984	0.9984	0.9984
16.50	0.9979	0.9980	0.9980	0.9980	0.9980	0.9980	0.9980	0.9980	0.9980	0.9981	0.9981
16.75	0.9976	0.9976	0.9976	0.9976	0.9977	0.9977	0.9977	0.9977	0.9977	0.9977	0.9977
17.00	0.9973	0.9973	0.9973	0.9973	0.9973	0.9973	0.9974	0.9974	0.9974	0.9974	0.9974
17.25	0.9969	0.9969	0.9970	0.9970	0.9970	0.9970	0.9970	0.9970	0.9971	0.9971	0.9971
17.50	0.9966	0.9966	0.9966	0.9966	0.9967	0.9967	0.9967	0.9967	0.9967	0.9968	0.9968
17.75	0.9962	0.9963	0.9963	0.9963	0.9963	0.9963	0.9964	0.9964	0.9964	0.9964	0.9964
18.00	0.9959	0.9959	0.9959	0.9960	0.9960	0.9960	0.9960	0.9961	0.9961	0.9961	0.9961
18.25	0.9955	0.9956	0.9956	0.9956	0.9957	0.9957	0.9957	0.9957	0.9958	0.9958	0.9958
18.50	0.9952	0.9952	0.9953	0.9953	0.9953	0.9953	0.9954	0.9954	0.9954	0.9955	0.9955
18.75	0.9949	0.9949	0.9949	0.9950	0.9950	0.9950	0.9950	0.9951	0.9951	0.9951	0.9952
19.00	0.9945	0.9946	0.9946	0.9946	0.9946	0.9947	0.9947	0.9947	0.9948	0.9948	0.9948
19.25	0.9942	0.9942	0.9942	0.9943	0.9943	0.9943	0.9944	0.9944	0.9944	0.9945	0.9945
19.50	0.9938	0.9939	0.9939	0.9939	0.9940	0.9940	0.9940	0.9941	0.9941	0.9942	0.9942
19.75	0.9935	0.9935	0.9936	0.9936	0.9936	0.9937	0.9937	0.9938	0.9938	0.9938	0.9939
20.00	0.9931	0.9932	0.9932	0.9933	0.9933	0.9933	0.9934	0.9934	0.9935	0.9935	0.9935

温度 ℃	15℃时密度, kg/m ³					
	690.0	692.0	694.0	696.0	698.0	700.0
-20.00	—	—	—	—	—	—
-19.75	—	—	—	—	—	—
-19.50	—	—	—	—	—	—
-19.25	—	—	—	—	—	—
-19.00	—	—	—	—	—	—
-18.75	—	—	—	—	—	—
-18.50	—	—	—	—	—	—
-18.25	—	—	—	—	—	—
-18.00	1.0420	1.0417	1.0415	1.0413	1.0410	1.0408
-17.75	1.0417	1.0414	1.0412	1.0409	1.0407	1.0405

续表 B1

温度 ℃	15℃时密度, kg/m ³					
	690.0	692.0	694.0	696.0	698.0	700.0
-17.50	1.0413	1.0411	1.0409	1.0406	1.0404	1.0402
-17.25	1.0410	1.0408	1.0406	1.0403	1.0401	1.0399
-17.00	1.0407	1.0405	1.0403	1.0400	1.0398	1.0396
-16.75	1.0404	1.0402	1.0399	1.0397	1.0395	1.0393
-16.50	1.0401	1.0399	1.0396	1.0394	1.0392	1.0390
-16.25	1.0398	1.0395	1.0393	1.0391	1.0389	1.0387
-16.00	1.0395	1.0392	1.0390	1.0388	1.0386	1.0384
-15.75	1.0391	1.0389	1.0387	1.0385	1.0383	1.0380
-15.50	1.0388	1.0386	1.0384	1.0382	1.0380	1.0377
-15.25	1.0385	1.0383	1.0381	1.0379	1.0376	1.0374
-15.00	1.0382	1.0380	1.0378	1.0376	1.0373	1.0371
-14.75	1.0379	1.0377	1.0375	1.0372	1.0370	1.0368
-14.50	1.0376	1.0374	1.0371	1.0369	1.0367	1.0365
-14.25	1.0373	1.0370	1.0368	1.0366	1.0364	1.0362
-14.00	1.0369	1.0367	1.0365	1.0363	1.0361	1.0359
-13.75	1.0366	1.0364	1.0362	1.0360	1.0358	1.0356
-13.50	1.0363	1.0361	1.0359	1.0357	1.0355	1.0353
-13.25	1.0360	1.0358	1.0356	1.0354	1.0352	1.0350
-13.00	1.0357	1.0355	1.0353	1.0351	1.0349	1.0347
-12.75	1.0354	1.0352	1.0350	1.0348	1.0346	1.0344
-12.50	1.0351	1.0349	1.0347	1.0345	1.0343	1.0341
-12.25	1.0347	1.0345	1.0343	1.0342	1.0340	1.0338
-12.00	1.0344	1.0342	1.0340	1.0338	1.0337	1.0335
-11.75	1.0341	1.0339	1.0337	1.0335	1.0333	1.0332
-11.50	1.0338	1.0336	1.0334	1.0332	1.0330	1.0329
-11.25	1.0335	1.0333	1.0331	1.0329	1.0327	1.0325
-11.00	1.0332	1.0330	1.0328	1.0326	1.0324	1.0322
-10.75	1.0329	1.0327	1.0325	1.0323	1.0321	1.0319
-10.50	1.0325	1.0324	1.0322	1.0320	1.0318	1.0316
-10.25	1.0322	1.0320	1.0319	1.0317	1.0315	1.0313
-10.00	1.0319	1.0317	1.0315	1.0314	1.0312	1.0310
-9.75	1.0316	1.0314	1.0312	1.0311	1.0309	1.0307
-9.50	1.0313	1.0311	1.0309	1.0307	1.0306	1.0304
-9.25	1.0310	1.0308	1.0306	1.0304	1.0303	1.0301
-9.00	1.0306	1.0305	1.0303	1.0301	1.0300	1.0298

续表 B1

温度 ℃	15℃时密度, kg/m ³					
	690.0	692.0	694.0	696.0	698.0	700.0
-8.75	1.0303	1.0302	1.0300	1.0298	1.0296	1.0295
-8.50	1.0300	1.0298	1.0297	1.0295	1.0293	1.0292
-8.25	1.0297	1.0295	1.0294	1.0292	1.0290	1.0289
-8.00	1.0294	1.0292	1.0290	1.0289	1.0287	1.0286
-7.75	1.0291	1.0289	1.0287	1.0286	1.0284	1.0282
-7.50	1.0287	1.0286	1.0284	1.0283	1.0281	1.0279
-7.25	1.0284	1.0283	1.0281	1.0279	1.0278	1.0276
-7.00	1.0281	1.0280	1.0278	1.0276	1.0275	1.0273
-6.75	1.0278	1.0276	1.0275	1.0273	1.0272	1.0270
-6.50	1.0275	1.0273	1.0272	1.0270	1.0269	1.0267
-6.25	1.0272	1.0270	1.0269	1.0267	1.0266	1.0264
-6.00	1.0268	1.0267	1.0265	1.0264	1.0262	1.0261
-5.75	1.0265	1.0264	1.0262	1.0261	1.0259	1.0258
-5.50	1.0262	1.0261	1.0259	1.0258	1.0256	1.0255
-5.25	1.0259	1.0257	1.0256	1.0255	1.0253	1.0252
-5.00	1.0256	1.0254	1.0253	1.0251	1.0250	1.0249
-4.75	1.0253	1.0251	1.0250	1.0248	1.0247	1.0246
-4.50	1.0249	1.0248	1.0247	1.0245	1.0244	1.0242
-4.25	1.0246	1.0245	1.0243	1.0242	1.0241	1.0239
-4.00	1.0243	1.0242	1.0240	1.0239	1.0238	1.0236
-3.75	1.0240	1.0239	1.0237	1.0236	1.0235	1.0233
-3.50	1.0237	1.0235	1.0234	1.0233	1.0231	1.0230
-3.25	1.0234	1.0232	1.0231	1.0230	1.0228	1.0227
-3.00	1.0230	1.0229	1.0228	1.0226	1.0225	1.0224
-2.75	1.0227	1.0226	1.0225	1.0223	1.0222	1.0221
-2.50	1.0224	1.0223	1.0222	1.0220	1.0219	1.0218
-2.25	1.0221	1.0220	1.0218	1.0217	1.0216	1.0215
-2.00	1.0218	1.0216	1.0215	1.0214	1.0213	1.0212
-1.75	1.0215	1.0213	1.0212	1.0211	1.0210	1.0208
-1.50	1.0211	1.0210	1.0209	1.0208	1.0207	1.0205
-1.25	1.0208	1.0207	1.0206	1.0205	1.0203	1.0202
-1.00	1.0205	1.0204	1.0203	1.0201	1.0200	1.0199
-0.75	1.0202	1.0201	1.0200	1.0198	1.0197	1.0196
-0.50	1.0199	1.0197	1.0196	1.0195	1.0194	1.0193
-0.25	1.0195	1.0194	1.0193	1.0192	1.0191	1.0190

续表 B1

温度 ℃	15℃时密度, kg/m ³					
	690.0	692.0	694.0	696.0	698.0	700.0
0.0	1.0192	1.0191	1.0190	1.0189	1.0188	1.0187
0.25	1.0189	1.0188	1.0187	1.0186	1.0185	1.0184
0.50	1.0186	1.0185	1.0184	1.0183	1.0182	1.0181
0.75	1.0183	1.0182	1.0181	1.0180	1.0179	1.0178
1.00	1.0180	1.0178	1.0177	1.0176	1.0175	1.0174
1.25	1.0176	1.0175	1.0174	1.0173	1.0172	1.0171
1.50	1.0173	1.0172	1.0171	1.0170	1.0169	1.0168
1.75	1.0170	1.0169	1.0168	1.0167	1.0166	1.0165
2.00	1.0167	1.0166	1.0165	1.0164	1.0163	1.0162
2.25	1.0164	1.0163	1.0162	1.0161	1.0160	1.0159
2.50	1.0160	1.0159	1.0159	1.0158	1.0157	1.0156
2.75	1.0157	1.0156	1.0155	1.0155	1.0154	1.0153
3.00	1.0154	1.0153	1.0152	1.0151	1.0151	1.0150
3.25	1.0151	1.0150	1.0149	1.0148	1.0147	1.0147
3.50	1.0148	1.0147	1.0146	1.0145	1.0144	1.0143
3.75	1.0144	1.0144	1.0143	1.0142	1.0141	1.0140
4.00	1.0141	1.0140	1.0140	1.0139	1.0138	1.0137
4.25	1.0138	1.0137	1.0136	1.0136	1.0135	1.0134
4.50	1.0135	1.0134	1.0133	1.0133	1.0132	1.0131
4.75	1.0132	1.0131	1.0130	1.0129	1.0129	1.0128
5.00	1.0128	1.0128	1.0127	1.0126	1.0126	1.0125
5.25	1.0125	1.0125	1.0124	1.0123	1.0122	1.0122
5.50	1.0122	1.0121	1.0121	1.0120	1.0119	1.0119
5.75	1.0119	1.0118	1.0117	1.0117	1.0116	1.0115
6.00	1.0116	1.0115	1.0114	1.0114	1.0113	1.0112
6.25	1.0112	1.0112	1.0111	1.0111	1.0110	1.0109
6.50	1.0109	1.0109	1.0108	1.0107	1.0107	1.0106
6.75	1.0106	1.0105	1.0105	1.0104	1.0104	1.0103
7.00	1.0103	1.0102	1.0102	1.0101	1.0101	1.0100
7.25	1.0100	1.0099	1.0098	1.0098	1.0097	1.0097
7.50	1.0096	1.0096	1.0095	1.0095	1.0094	1.0094
7.75	1.0093	1.0093	1.0092	1.0092	1.0091	1.0091
8.00	1.0090	1.0090	1.0089	1.0088	1.0088	1.0087
8.25	1.0087	1.0086	1.0086	1.0085	1.0085	1.0084
8.50	1.0084	1.0083	1.0083	1.0082	1.0082	1.0081

续表 B1

温度 ℃	15℃时密度, kg/m ³					
	690.0	692.0	694.0	696.0	698.0	700.0
8.75	1.0080	1.0080	1.0079	1.0079	1.0079	1.0078
9.00	1.0077	1.0077	1.0076	1.0076	1.0075	1.0075
9.25	1.0074	1.0074	1.0073	1.0073	1.0072	1.0072
9.50	1.0071	1.0070	1.0070	1.0070	1.0069	1.0069
9.75	1.0068	1.0067	1.0067	1.0066	1.0066	1.0066
10.00	1.0064	1.0064	1.0064	1.0063	1.0063	1.0063
10.25	1.0061	1.0061	1.0060	1.0060	1.0060	1.0059
10.50	1.0058	1.0058	1.0057	1.0057	1.0057	1.0056
10.75	1.0055	1.0054	1.0054	1.0054	1.0053	1.0053
11.00	1.0052	1.0051	1.0051	1.0051	1.0050	1.0050
11.25	1.0048	1.0048	1.0048	1.0047	1.0047	1.0047
11.50	1.0045	1.0045	1.0045	1.0044	1.0044	1.0044
11.75	1.0042	1.0042	1.0041	1.0041	1.0041	1.0041
12.00	1.0039	1.0038	1.0038	1.0038	1.0038	1.0038
12.25	1.0035	1.0035	1.0035	1.0035	1.0035	1.0034
12.50	1.0032	1.0032	1.0032	1.0032	1.0031	1.0031
12.75	1.0029	1.0029	1.0029	1.0028	1.0028	1.0028
13.00	1.0026	1.0026	1.0025	1.0025	1.0025	1.0025
13.25	1.0023	1.0022	1.0022	1.0022	1.0022	1.0022
13.50	1.0019	1.0019	1.0019	1.0019	1.0019	1.0019
13.75	1.0016	1.0016	1.0016	1.0016	1.0016	1.0016
14.00	1.0013	1.0013	1.0013	1.0013	1.0013	1.0013
14.25	1.0010	1.0010	1.0010	1.0010	1.0009	1.0009
14.50	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006
14.75	1.0003	1.0003	1.0003	1.0003	1.0003	1.0003
15.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
15.25	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997
15.50	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994
15.75	0.9990	0.9990	0.9990	0.9990	0.9991	0.9991
16.00	0.9987	0.9987	0.9987	0.9987	0.9987	0.9987
16.25	0.9984	0.9984	0.9984	0.9984	0.9984	0.9984
16.50	0.9981	0.9981	0.9981	0.9981	0.9981	0.9981
16.75	0.9977	0.9978	0.9978	0.9978	0.9978	0.9978
17.00	0.9974	0.9974	0.9974	0.9975	0.9975	0.9975
17.25	0.9971	0.9971	0.9971	0.9971	0.9972	0.9972

续表 B1

温度 ℃	15℃时密度, kg/m ³					
	690.0	692.0	694.0	696.0	698.0	700.0
17.50	0.9968	0.9968	0.9968	0.9968	0.9968	0.9969
17.75	0.9964	0.9965	0.9965	0.9965	0.9965	0.9966
18.00	0.9961	0.9961	0.9962	0.9962	0.9962	0.9962
18.25	0.9958	0.9958	0.9959	0.9959	0.9959	0.9959
18.50	0.9955	0.9956	0.9955	0.9956	0.9956	0.9956
18.75	0.9952	0.9952	0.9952	0.9952	0.9953	0.9953
19.00	0.9948	0.9949	0.9949	0.9949	0.9950	0.9950
19.25	0.9945	0.9945	0.9946	0.9946	0.9946	0.9947
19.50	0.9942	0.9942	0.9943	0.9943	0.9943	0.9944
19.75	0.9939	0.9939	0.9939	0.9940	0.9940	0.9940
20.00	0.9935	0.9936	0.9936	0.9937	0.9937	0.9937

附加说明:

本标准由石油工业计量专业标准化技术委员会提出并归口。

本标准由中国石油天然气总公司计量测试研究所、大庆石油管理局运销处负责起草。

本标准主要起草人郭文平、王世和。