

DSC SPECIFIC HEAT CAPACITY LITERATURE VALUES FOR: SAPPHIRE AND WATER

The use of a well defined reference material is required to perform accurate specific heat capacity measurements on the DSC. Sapphire is usually the preferred reference material but in the case of liquid analysis air-free water is sometimes used in order to better match the heat capacity of the sample being analyzed. The following tables summarize the literature values for both these references.

Specific Heat Capacity Literature Values For Sapphire*

Temperature Specific Heat			Temperature Specific Heat			Temperature Specific Heat		
Heat								
°C	°K	J/g°C	°C	°K	J/g°C	°C	°K	J/g°C
-183.15	900.0949		136.85	4100.9545		506.85	7801.1726	
-173.15	1000.1261		146.85	4200.9660		526.85	8001.1783	
-163.15	1100.1603		156.85	4300.9770		546.85	8201.1837	
-153.15	1200.1968		166.85	4400.9875		566.85	8401.1888	
-143.15	1300.2349		176.85	4500.9975		586.85	8601.1937	
-133.15	1400.2739		186.85	4601.0070		606.85	8801.1985	
-123.15	1500.3134		196.85	4701.0161		626.85	9001.2030	
-113.15	1700.3526		206.85	4801.0247		646.85	9201.2074	
-103.15	1700.3913		216.85	4901.0330		666.85	9401.2117	
-93.15	1800.4291		226.85	5001.0409		686.85	9601.2159	
-83.15	1900.4659		236.85	5101.0484		706.85	9801.2198	
-73.15	2000.5014		246.85	5201.0557		726.85	10001.2237	
63.15	2100.5356		256.85	5301.0627		746.85	10201.2275	
-53.15	2200.5684		266.85	5401.0692		766.85	10401.2312	
43.15	2300.5996		276.85	5501.0756		786.85	10601.2348	
-33.15	2400.6294		286.85	5601.0817		806.85	10801.2383	
-23.15	2500.6579		296.85	5701.0876		826.85	11001.2417	
-13.15	2600.6848		306.85	5801.0932		846.85	11201.2451	
-3.15	2700.1103		316.85	5901.0987		866.85	11401.2484	
0.00	273.150.7180		326.85	6001.1038		886.85	11601.2516	
6.85	2800.7343		336.85	6101.1089		906.85	11801.2548	
16.85	2900.7572		346.85	6201.1137		926.85	12001.2578	
26.85	3000.7788		356.85	6301.1183		976.85	12501.2653	
36.85	3100.7994		366.85	6401.1228		1026.85	13001.2724	
46.85	3200.8188		376.85	6501.1271		1076.85	13501.2792	
56.85	3300.8373		386.85	6601.1313		1126.85	14001.2856	
66.85	3400.8548		396.85	6701.1353		1176.85	14501.2917	
76.85	3500.8713		406.85	6801.1393		1226.85	15001.2975	
86.85	3600.8871		416.85	6901.1431		1276.85	15501.3028	
96.85	3700.9020		426.85	7001.1467		1326.85	16001.3079	
106.85	3800.9161		446.85	7201.1538		1376.85	16501.3128	
116.85	3900.9296		466.85	7401.1604				
126.85	4000.9423		486.85	7601.1667				

* D. A. Ditmars. et. al., *Jour. Res. National Bureau of Standards*, **87**, (2), 159-163 (1982)

Specific Heat Capacity Literature Values For Air-Free Water*

Temp. °C	Specific Heat cal./g/°CJ/g/°C	Temp. °C	Specific Heat cal./g/°CJ/g/°C	Temp. °C	Specific Heat cal./g/°CJ/g/°C
01.007384.2177		340.997954.1782		681.000414.1885	
11.006524.2141		350.997954.1782		691.000534.1890	
21.005714.2107		360.997974.1783		701.000674.1896	
31.004994.2077		370.997974.1783		711.000814.1902	
41.004304.2048		380.997994.1784		721.000964.1908	
51.003684.2022		390.998024.1785		731.001124.1915	
61.003134.1999		400.998044.1786		741.001274.1921	
71.002604.1977		410.998074.1787		751.001434.1928	
81.002134.1957		420.998114.1789		761.001604.1935	
91.001704.1939		430.998164.1791		771.001774.1942	
101.001294.1922		440.998194.1792		781.001944.1949	
111.000934.1907		450.998264.1795		791.002134.1957	
121.000604.1893		460.998304.1797		801.002294.1964	
131.000294.1880		470.998354.1799		811.002484.1972	
141.000024.1869		480.998424.1802		821.002684.1980	
150.999764.1858		490.998474.1804		831.002874.1988	
160.999554.1849		500.998544.1807		841.003084.1997	
170.999334.1840		510.998624.1810		851.003274.2005	
180.999144.1832		520.998714.1814		861.003494.2014	
190.998974.1825		530.998784.1817		871.003704.2023	
200.998834.1819		540.998854.1820		881.003924.2032	
210.998694.1813		550.998954.1824		891.004164.2042	
220.998574.1808		560.999054.1828		901.004374.2051	
230.998474.1804		570.999144.1832		911.004614.2061	
240.998384.1800		580.999244.1836		921.004854.2071	
250.998284.1796		590.999334.1840		931.005094.2081	
260.998214.1793		600.999434.1844		941.005354.2092	
270.998144.1790		610.999554.1849		951.005614.2103	
280.998094.1788		620.999644.1853		961.005884.2114	
290.998044.1786		630.999764.1858		971.006144.2125	
300.998024.1785		640.999884.1863		981.006404.2136	
310.997994.1784		651.000004.1868		991.006694.2148	
320.997974.1783		661.000144.1874		1001.006974.2160	
330.997974.1783		671.000264.1879			

* From Osborne, Stimson, and Ginnings; *B. of S. Jour. Res.* **23**, 238 (1939) in *Handbook of Chemistry and Physics*, 70th edition, **D173** (1989-1990).