

Boiling point of water vs pressure

2019

Fully developed
boiling.

AF. PS. PM (1450 -)

Fri 22 Nov 2019

Spontaneous boiling prior to turning off pump.

T/°C	P/kPa	T _{air} in bell jar/°C
18.1	2.7	17.6
		START NO HEAT
Heat till boils: ±0.3	9.08 ±0.2	21.7 ±0.3
✗ 45.4		
✗ 58.4	17.8	23.5
✗ 64.5	23.4	23.6
✗ 76.6	37.1	30.3
✗ 80.4	47.6	33.4
✗ 84.2	56.5	34.8
✗ 88.5	65.8	35.7
Sett @ atm p _i then reduce p until boil.		
88.2	63.7	36.12
78.0	42.5	33.4
69.9	30.6	31.8
59.6	17.8	30.9
Spontaneous boil spontaneously even down to ~4 kPa.		
Heated again to about 60°C. Then p ↓ till boil.		
55.9	15.7	26.7
40.7	6.5	28.9
49.5	13.9	27.4
65.9	28.1	27.7
✗ Constant heating (2.4.85A)		
Boil raised pressure in steps.		
		Bell jar condensation makes it hard to determine boiling point.

Explosion!

Not just boiling - visible condensation

$T_{\text{boil}} / ^\circ\text{C} \pm 0.3$	$P / \text{hPa} \pm 0.2$	$T_a / ^\circ\text{C} \pm 0.3$
71.6	34.6	28.7
71.6 77.8	42.0	29.9
81.0	42.0 47.9	32.2
85.5	56.8	34.1
85.5	56.8	36.7
88.8	63.8	38.2
90.5	68.5	40.2
91.7	71.8	42.3
93.2	75.2	
	7	

* Heat to desired temp
 boil if \geq at 100 temp

ambient. } Start at
 40°C and
 100°C ΔT
 $\geq 5^\circ\text{C}$

* Then reduce pressure till boil.

* Raise pressure,
 repeat.