Clausius–Clapeyron: Vapour Pressure at Another Temperature

Vapour pressure at a second temperature from one known point and the heat of vaporisation, and the boiling point at a chosen pressure (Clausius–Clapeyron).

Method: Clausius–Clapeyron $\ln(p_2/p_1) = -(\Delta H_v/R)(1/T_2 - 1/T_1)$

Input parameters

Unit system: SI

Parameter	Value	Unit
Known vapour pressure	101.33	kPa
Temperature of the known point	78.250	°C
Heat of vaporisation (molar)	38.560	kJ/mol
Temperature wanted	50.000	°C
Pressure for the boiling point	50.000	kPa

Calculated results

Parameter	Value	Unit
Vapour pressure at T_2	31.963	kPa
Boiling point at p_t	60.399	°C

Notes for this case

- Constant heat of vaporisation; best over modest temperature ranges.

Formula and method

$$\ln\frac{p_2}{p_1} = -\frac{\Delta H_v}{R}\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

Variables

p_1	Known vapour pressure	Pa
T_1	Temperature of the known point	K
ΔH_v	Heat of vaporisation (molar)	J/mol
T_2	Temperature wanted	K
p_t	Pressure for the boiling point	Pa
p_2	Vapour pressure at T_2	Pa
T_b	Boiling point at p_t	K

Method and standards

Clausius–Clapeyron.

Assumptions and limits

- Constant ΔH_v, ideal vapour.

References

- Clausius–Clapeyron $\ln(p_2/p_1) = -(\Delta H_v/R)(1/T_2 - 1/T_1)$

Report details

Report reference	FCC-ZE6E-P20N (the same inputs always give the same reference)
Generated	17 November 2026, 19:49 UTC
Calculator	Clausius–Clapeyron: Vapour Pressure at Another Temperature
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/separation/clausius-clapeyron

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.