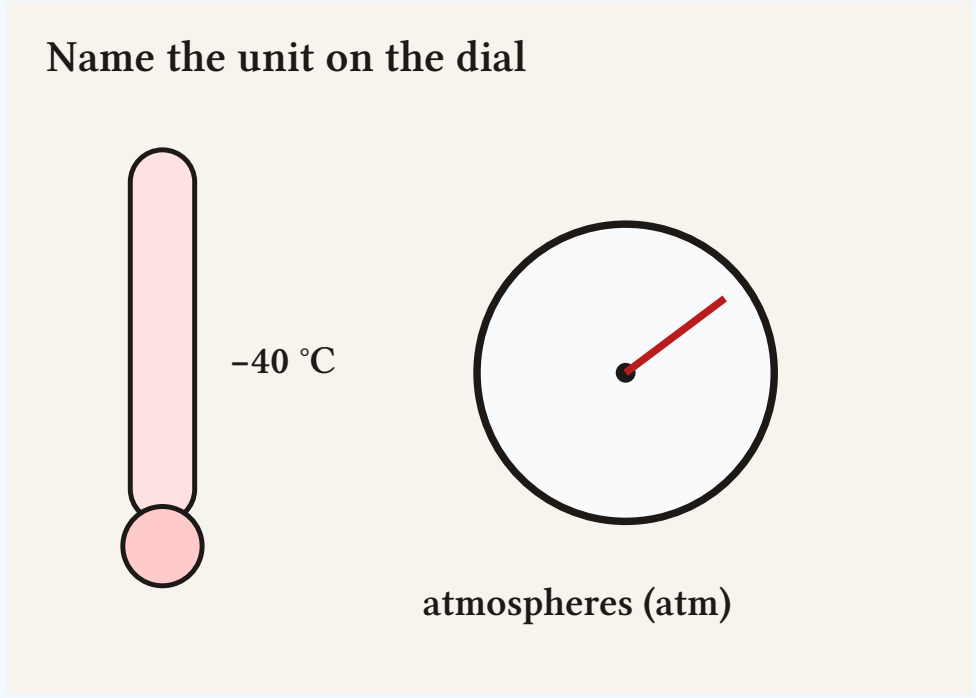
Chemistry 20

Unit B: Gases and the gas laws

Kelvin temperature and pressure units

A cold morning and two dials

- A bench thermometer can read −40 °C while a nearby gauge is marked in atmospheres.
- Gas calculations need one temperature scale and a stated pressure unit before any proportion is written.



Kelvin and pressure units

- Kelvin temperature equals the Celsius reading plus 273.15, and absolute zero is 0 K.
- Sea-level air pressure can be written 101.325 kPa, 1 atm, or 760 mmHg, and precise instruments made those readings trustworthy.

Key terms

kelvin

The temperature scale that places its zero at absolute zero and is reached from Celsius by adding 273.15. (K)

absolute zero

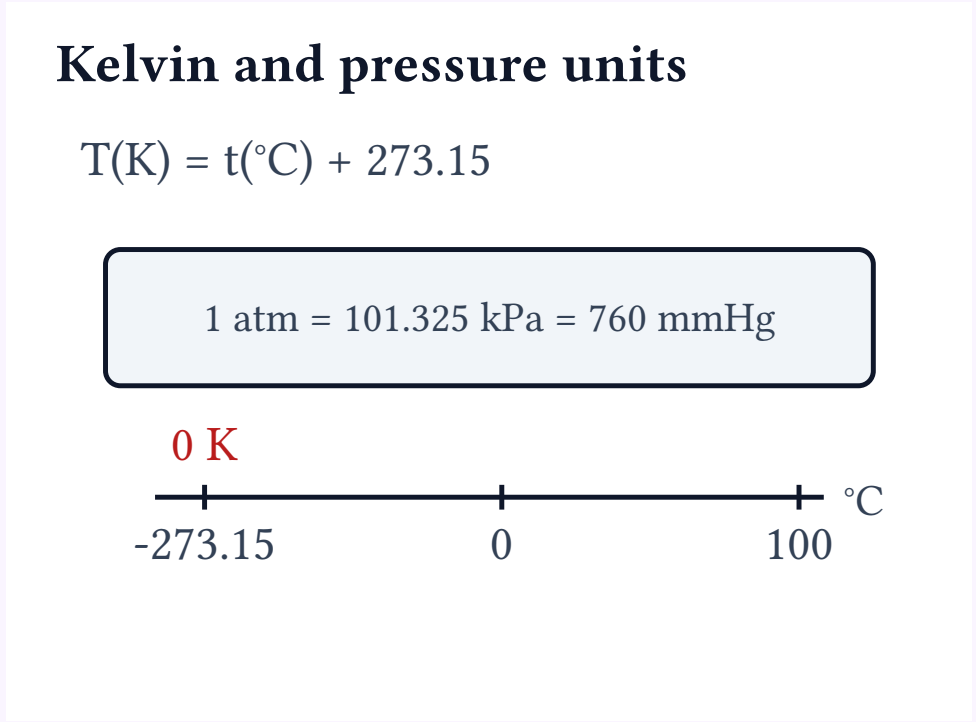
The zero point on the kelvin scale, written 0 K, equal to −273.15 degrees Celsius. (0 K)

kilopascal

A pressure unit in which average sea-level air pressure is 101.325, the same pressure as 1 atmosphere or 760 millimetres of mercury. (kPa)

Absolute zero and pressure units

- T(K) = t(C) + 273.15, so 0 K equals −273.15 °C.
- That same pressure is 101.325 kPa, 1 atm, and 760 mmHg.



Three temperature conversions

- Each Celsius reading increases by 273.15 on the way to kelvin.
- For a negative Celsius reading, you still add 273.15.

Converting 2.00 atm both ways

- Use 101.325 kPa for each atmosphere when the target unit is kilopascals.
- Use 760 mmHg for each atmosphere when the target unit is millimetres of mercury.

Temperature and pressure

- Convert 100 °C to kelvin and state the Celsius mark of absolute zero.
- Say what a thermocouple, a thermistor, and a Bourdon gauge measure.