

Mayer's relation

@wikipedia

Universal relation between [Isobaric molar heat capacity](#) (c_P) and [Isochoric molar heat capacity](#) (c_V):

(1)
$$c_P - c_V = V_m T \frac{\alpha_V^2}{\epsilon_T}$$

where

T	temperature	V_m	molar volume
ϵ_T	Isothermal Compressibility	α_V	thermal expansion coefficient

For [incompressible matter](#) the [Isobaric molar heat capacity](#) (c_P) and [Isochoric molar heat capacity](#) (c_V) are identical:

(2)
$$c_P = c_V$$

For the [ideal gas](#) it will take a form:

(3)
$$c_P - c_V = R$$

where

R	Gas constant
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Both [incompressible matter](#) and [ideal gas](#) are idealistic models but some real [mattes](#) come very close to conditions of [\(2\)](#) or [\(3\)](#) at engineering level of accuracy.

See also

[Physics](#) / [Thermodynamics](#) / [Thermodynamic process](#) / [Heat Transfer](#) / [Heat Capacity](#) / [Molar heat capacity](#)

[[Heat](#)]