

2.2: The Zeroth Law of Thermodynamics

Equilibrium is established by the exchange of energy, volume, or particle number between different systems or subsystems:

energy exchange	\implies	$T = \text{constant}$	\implies	thermal equilibrium
volume exchange	\implies	$\frac{p}{T} = \text{constant}$	\implies	mechanical equilibrium
particle exchange	\implies	$\frac{\mu}{T} = \text{constant}$	\implies	chemical equilibrium

Equilibrium is transitive, so

If A is in equilibrium with B, and B is in equilibrium with C, then A is in equilibrium with C.

This known as the Zeroth Law of Thermodynamics⁵.

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