

# Zeroth Law of Thermodynamics

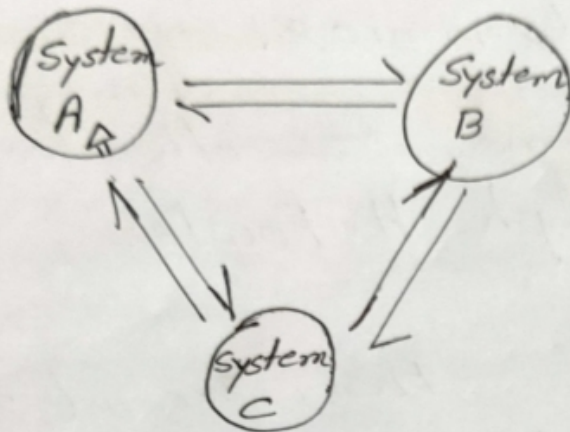


Fig:-1.

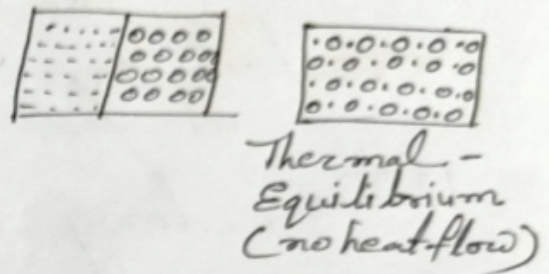


Fig:-2.

## zeroth law of thermodynamics

According to this law, two systems in thermal equilibrium with a third system separately, are also in thermal equilibrium with each other. i.e. if two systems A & B are in thermal equilibrium with the third system C separately, then both the systems A & B will also be in thermal equilibrium with each other.

$$\text{if } \text{Temp. A} = \text{Temp. C} \quad \text{--- (1)}$$

$$\text{Temp. C} = \text{Temp. B} \quad \text{--- (2)}$$

then  $\text{Temp. A} = \text{Temp. B} \rightarrow \text{thermal equilibrium}$

P.T.O  $\rightarrow$

In another words we can say that  
"If ~~the~~ temp. of system A & B is equal  
to temp of system C, then temp. of  
A & B will also be equal." → zeroth  
law of thermodynamics.

The name 'zeroth law was  
invented by Ralph H. Fowler in the  
1930s, long after First, second & third  
laws were widely recognized. Then the  
scientists realized that one more law is  
required to complete the set. However the  
zeroth law is the formal definition of  
temperature and it is considered as a  
more fundamental law when compared  
to the other three laws, that is why it  
is known as zeroth law of thermodynamics.  
\* The zeroth law of thermodynamics is  
the working principle of a thermometer.

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