**8. 0th LAW OF THERMODYNAMICS**

**THERMAL EQUILIBRIUM:** When two bodies are in contact, heat flows from a body at higher temperature to a body at lower temperature until the both bodies attain same final temperature.

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| **ADIABATIC WALL:** Doesn’t permit heat transfer. E.g. Thermocol, Glass Wool. | **DIATHERMIC WALL:** Permit heat transfer. E.g. All metals. |

**STATEMENT OF ZEROTH LAW:**

When two bodies are in thermal equilibrium with third body, then there are in thermal equilibrium with each other.

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| 0th Law: Concept of Temp. | 1st Law: Energy Conservation. | 2nd Law: Direction of heat transfer & Process Possibility. |

**TEMPERATURE MEASUREMENT:**

**THERMOMETRIC PROPERTY:** Any property of body which is function of temperature only is called thermometric property. E.g. Pressure, Volume, Length, etc…

**THERMOMETRIC SUBSTANCE:** Substance which is used in temperature measurement is called thermometric substance. E.g. Mercury/ Alcohol in thermometer, etc…

**TYPES OF THERMOMETERS:**

1. **RESISTANCE THERMOMETER:** It works on bridge principle. Here, resistance is thermometric property.
2. **THERMOCOUPLE:** It works based on see-back effect. When Two dissimilar metals joints together and maintained at different temperature, EMF or voltage is generated. So, EMF (Thermometric property) is measured.
3. **CONSTANT VOLUME GAS THERMOMETER:** It works based on ideal gas law. Here, gas is used as thermometric substance. It uses Gay-Lussac's law. Here, pressure (Thermometric property) is measured.
4. **CONSTANT PRESSURE GAS THERMOMETER:** It works based on ideal gas law. Here, gas is used as thermometric substance. It uses Charles law. Here, Volume (Thermometric property) is measured.

**REFERENCE POINT:** These are points with respect to which all temperatures are measured. These point remains constant everywhere. E.g. Freezing Point of water Ice Point , Boiling Point of Water Steam Point, Triple point of Water.

**TEMPERATURE MEASUREMENT METHODS:**

**BEFORE 1954:** Two reference points (Steam point & Ice Point) are used in below equation.

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**AFTER 1954:** Single reference points (Triple Point of Water) is used in below equation.

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**TEMPERATURE SCALE:**

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| **CENTIGRADE SCALE AND FAHRENHEIT:**  It’s arbitrary temperature scale. (Body Temp. ) | |  |  |  | | --- | --- | --- | | **100** | **S. P.** | **212** | | **0** | **I. P.** | **32** | |  |  |  | |

**IMP POINTS IN ZEROTH LAW:**

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| * S.I. unit of temp is Kelvin. () * Constant Volume Gas Thermometer is used in experiment and Tried to get as shown in figure. * Ideal gas thermometer is independent of thermometric substance. * Ideal gas Temperature scale is identical to Kelvin scale. | GAS THERMOMETER - Definition and synonyms of gas thermometer in the English  dictionary |