WATER BATH

Definition the water bath:

A water bath is laboratory instrument . It is a container or vessel filled with heated water. The temperature of water is maintained at a constant level . It is used to incubate samples over a period of time at a constant temperature.

The main parts of water bath:

1-Container or tank bath

2-Heater.

3-Thermometer.

4-Thermostat or regulator.

Types of water bath:

1-Circulating water bath.

2-Non-circulating water bath.

3-Shaking water bath

Circulating water bath:

is also called stirrer water bath. It is perfect for uses when temperature uniformity

and regularity are critical; water is thoroughly distributed throughout the bath

resulting in a uniform temperature: It is used for some specific substances or chemical

reaction and reagents for example, enzymatic and serologic experimentations.

To ensure an optimum temperature uniformity throughout the whole bath.

An electric motor with rotary magnet is flanged to the bath bottom

Non-circulating water bath:

It is less accurate in terms of temperature control. This type of water bath depend

on mainly on convection instead of water being uniformly heated

Shaking water bath:

This type of water bath has additional control for shaking , which moves liquids from place to another place. Shaking feature can be turned on or turned off. Constant

shaking allows the incubated liquid sample to be mix in constant level and the temperature is maintained at a constant point.

Principle of water bath:

principle of water bath This device depends on the heat applied to the sample using the heater.

Uses of water bath:

1-used to improve the solubility of poorly soluble substances.

2-It used for melting of some substances.

3-It used for warming of chemical reagents.

4- It used for facilitating of some chemical reactions.

5. For incubation of cell cultures.

6. It is used as a heat source for some substance such as flammable chemicals.

Practical application:

1- If the equipment has been stored in cold or humid conditions, condensation may form inside it. Therefore, allow time (at least 2 hours) for the condensationto evaporate before using the equipment.

2- It is not recommended to use water bath with moisture sensitive reactions.

3- Water level should be regularly monitored and filled with distilled water or deionized water. This is required to prevent salts from depositing on the heater.

4- Disinfectants or bactericidal agents can be added to prevent growth of organisms.

5- For the purpose of decontamination the temperature of water bath may be raise to 90°C or higher to once a week for half an hour

6- If application involves liquids that give out vapors (gases) , It is recommended to operate water bath in gas hood or in a well ventilated area

7- The cover is closed to prevent evaporation and to help reaching high temperatures.

8- Set up on a steady surface away from flammable materials.
9- Change the water regularly and empty when not in use for prolonged periods.
10- Before emptying a bath, allow the water temperature to fall to a safe level
11- Do not use the equipment in an area where there are aggressive or explosive chemical nixtures.
12- Do not use the bath to heat any material that could cause a fire or any other kind of hazard.

Addition:

1- Things that make an ideal device: the window that makes us briefed on the sample without opening the lid.

2- Size of the device is made by shape of the container that contains the sample

3- Many chemical reaction occur at certain temperature for example, at 37 °C F 0.5 (body temperature) or at high temperature (50.60.70) . Such practical requirements are met by using water bath. When the reactants in a water bath, the water surrounding the tubes warms the substances inside the tube and it takes the temperature as the water.

4- Most tanks, as well as immersed parts, are made from stainless steel. Stainless steel (is highly suitable for applications where hygiene is important; it exhibits good heat resistance and excellent resistance to corrosion

5- All water baths have a digital interface to allow users to set a desired temperature.

6- Different types of water baths are used depending on application for all water bathes, it can be used up to 99.9°C water temperature is above in 100°C, alternative methods may be used, such

1- oil bath

2- silicone bath

3- sand bath