Thermal expansion-Boiling

A. Thermal expansion

Theoretical part

Almost all materials solids, liquids and gases, when their temperature increases (heated), expands, i.e. their volume increases, while when their temperature is reduced (cooled), they contract. This phenomenon is called **Thermal expansion** and the opposite of the phenomenon, **Contraction**. However, all bodies do not expand or contract in the same way. The lid, which is usually made of iron or aluminum, is more contracted than the glass vase so it stucks in the spout of the jar when it is placed in the refrigerator where it is cooled. Of all the bodies the solids expand less, the fluids more and the end gases expand more than all the physical bodies.

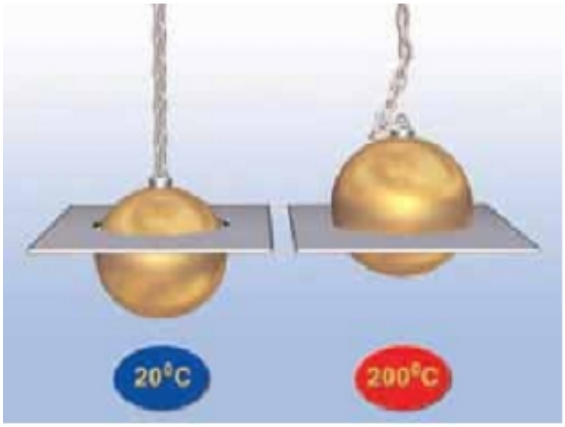

Fig. 1 *Cubic Thermal expansion*

Experimental part

Instruments, apparatus and materials:

1. Linear expansion Device
2. Thermal expansion Device by volume
3. Stove-tripod-mesh
4. Water
5. Volumetric flask with long neck
6. Conical flask
7. Balloon
8. Candle
9. Glass Basin

Experimental procedure:

1. In the volume expansion device, try to pass the ball through the ring. After heating the ball with the stove (**Do not touch the flame in the metal**), try to pass it through the ring. Write down your comments.

2. Fill the volumetric flask **Until** I marked it with water. If there is no mark, note the water level with a marker. Place it on the grid and turn on the stove.

3. Let it pass for a few minutes. What happens to the water level? Write down your comments.

4. Place a balloon in the conical flask. Fill the glass basin with hot water (**There is a kettle**) and place the conical flask inside. What happens to the balloon after a while?

B. Boiling

Theoretical part

Boiling is the fast degassing by producing steam bubbles throughout the mass of the liquid. It starts at a certain temperature, temperature or boiling point, which is typical for each liquid. Thus, for water the boiling temperature is 100°C At atmospheric pressure 1 Atm.

The boiling temperature is a characteristic size of each body. But it depends on the atmospheric pressure exerted on the liquid. In general, increased pressure increases the boiling point, while the opposite occurs when the pressure decreases.

Experimental part

Instruments, apparatus and materials

1. Spherical flask 250 ml
2. Stove-tripod-mesh
3. Thermometer
4. Wooden Clothespin
5. Water
6. Salt

Experimental procedure:

1. In the spherical flask put 100 Ml Water. Fastened the thermometer in the bottle in such a way that the tip of the mercury touches the surface of the water. Position the flask on the grid.

2. Note the initial water temperature on Table 1. Light the stove by adjusting the flame low (mild heating). Each 30 s (0.5 min) Indicate the thermometer in Table 1.

3. When the water boils what do you observe?

4. Let the water boil two more minutes and note its temperature in table 1. Then turn off the stove.

Time t (min)	**0**	**0,5**	**1**	**1,5**	**2**	**2,5**	**3**	**3,5**	**4**
Temperature Θ°C									

Time t (min)	**4,5**	**5**	**5.5**	**6**	**6,5**	**7**	**7,5**	**8**	**8,5**
Temperature Θ°C									

Time t (min)	**9**	**9,5**	**10**	**10,5**	**11**	**11,5**	**12**	**12,5**	**13**
Temperature Θ°C									