

Chemistry Pathfinder Honour -Experiments

b. Place an ice cube in a glass of water, place a four-inch (10.2 cm) string on top of the glass and ice, then solve the problem of taking the ice cube out of the water without touching it.

Equipment

- Ice
- Salt
- Water
- Glass
- String (10cm long)

Method

1. Put the ice cube in the glass
2. Tie a loop on the string and place it on the cube
3. Put a pinch of salt on the loop and cube
4. Wait a while then pull up the string



C. With the use of water, turpentine, and soap, transfer a newspaper picture to a blank sheet of paper.

Equipment:



15ml turpentine



30ml soap powder



60ml of hot water



Small Bowl



Measuring Cup



A paintbrush



Newspapers/old magazines

Method:

- Mix the soap powder with the water to dissolve soap powder in hot water
- Then add turpentine.
- Dip a brush into the ink and brush over the picture to be transferred
- Wait approximately 10 seconds
- Place a piece of paper over the picture and rub the back of it with a spoon.
- The picture will be transferred to the paper.

The ink will solidify in its container after a little while. To reverse this simply set the bottle in a pan of warm water until melted and then shake.



d. With the use of a candle and a piece of cardboard, demonstrate visually the three parts of a candle flame.

Equipment

- Candle
- Cardboard

Method

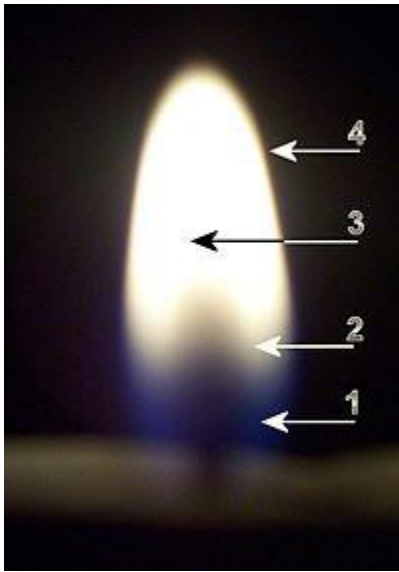
1. Blue Zone
 - The blue area is the base of the flame.
 - Some of combustion takes place here
 - The temperature in this area is about 1200-1400 °C.
2. Dark Zone
 - The dark area in the middle of the flame just above the tip
 - This dark core of the flame is around 800-1000 °C.

3. Luminous Zone

- The yellow luminous area is above the dark area
- This brighter, yellower part of the flame is the remaining carbon being oxidized to form carbon dioxide
- This area is approximately 1200 °C.

4. Flame Mantle

- This is on the outer rim of the flame
- Colourless, or a very faint blue
- The hottest part of the candle flame, about 1400 °C.



e. With a bowl of water, wooden match sticks, a lump of sugar, and small amount soap, demonstrate the action of sugar and soap on the floating match sticks.

Experiment

- Sugar cube
- Dish soap
- 2 bowls
- 12 Toothpicks (or wooden matchsticks)
- Water

Method

1. Fill both bowls with water
2. Drop 6 toothpicks into each bowl
3. Place the sugar cube in one bowl. The toothpicks should be drawn to it

4. Place one drop of dish detergent in the other bowl. The toothpicks should be repelled from it

Note:

- Sugar absorbs water, and as it does, it creates a small current that draws the toothpicks toward it.
- The soap, on the other hand, breaks the surface tension of the water and immediately spreads out over the surface. As it moves across the surface, it too creates a current, carrying the toothpicks along as it goes.



f. Place a fresh egg in fresh water and then salt-water, noting the difference.

Equipment:



Fresh (uncooked)egg



1 litre water



120ml salt



2 Bowls

Method

- Add the salt and a half litre of water to a bowl and stir until the salt dissolves.
- Add the other half litre of water to the other bowl - do not add any salt.

DO NOT CRACK THE EGG

- Place the egg in the salted water. It should float
- Move the egg to the unsalted water. It should sink.



Tap Water



Salt Water

Salt-water is more dense than fresh water.

This means that a volume of salt-water will weigh more than an equal volume of fresh water.

The density of an egg is between the density of salt-water and fresh water.

An item will float if it is less dense than the liquid in which it is placed.

Since the egg is more dense than fresh water, it sinks.

But because the egg is less dense than the salt-water, it floats.

NOTE: If nothing happens, then get two eggs and place one in the fresh water and the other in the salt-water. The fresh-water egg should expand, and the salt-water egg should shrink due to osmosis.