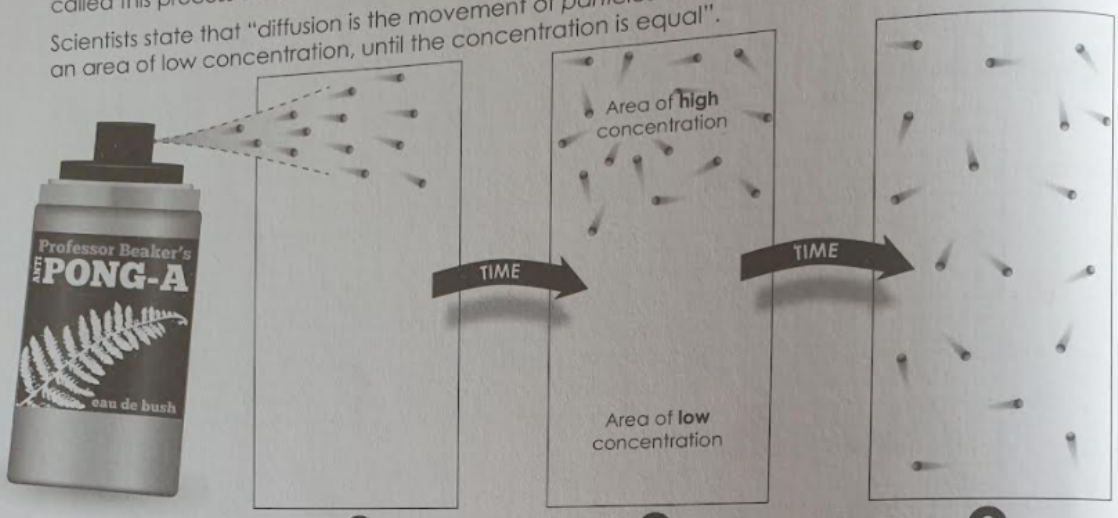
When gas particles, like the perfumes in a can of deodorant, are released into a room they are free to move in any direction. Eventually, they will spread throughout the entire room. Scientists called this process *diffusion*.

Scientists state that "diffusion is the movement of *particles* from an area of high concentration to an area of low concentration, until the concentration is equal".



1. Gas particles are released into a room.
2. There is a high concentration of particles where they were released.
3. Because the particles are free to move, the concentration eventually becomes equal.

Observing Diffusion

Aim: To observe diffusion in a liquid.

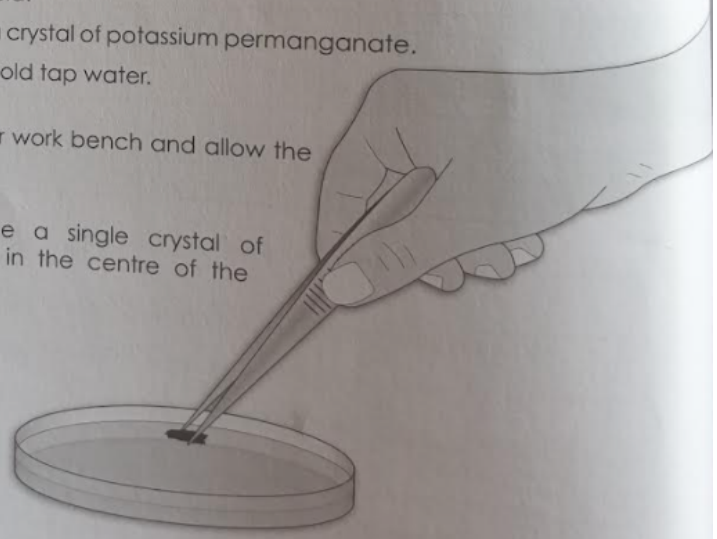
Equipment: Petri dish, water, tweezers, a crystal of potassium permanganate.

Method:

1. Half fill your petri dish with cold tap water.
2. Place the petri dish on your work bench and allow the water to become settled.
3. Using the tweezers, place a single crystal of potassium permanganate in the centre of the petri dish.

Potassium permanganate is poisonous

4. Observe for 5 minutes.
5. Repeat the experiment using hot water.



Observations:

In cold water: _____

_____

In hot water: _____

_____

Explanation: _____

_____

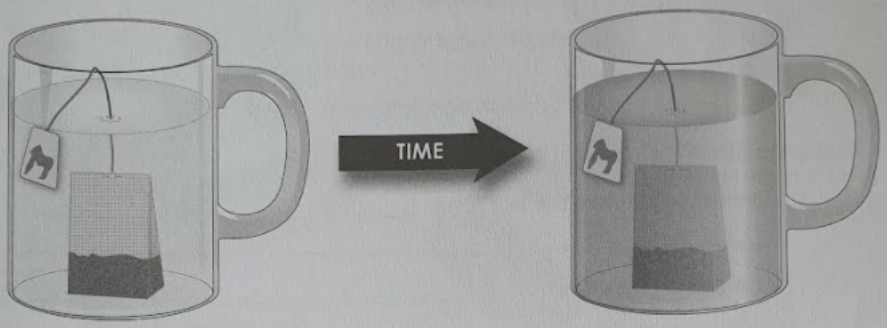
_____

_____

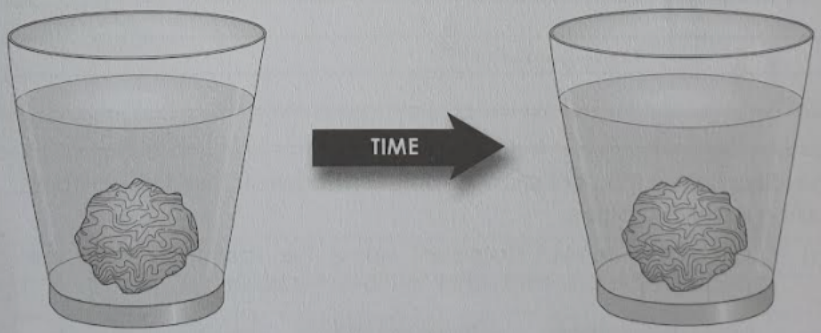
1. Using the words and phrases below, explain the following observations:

particles	high concentration	low concentration	diffusion

(a) If a tea bag is left undisturbed in a cup of water, the water will eventually darken.



(b) If a rock is placed into a glass of water, the rock will not diffuse into the water.



2. Complete the following sentences.

Diffusion occurs fastest in g_____ because the particles have more space and therefore m_____ around more.

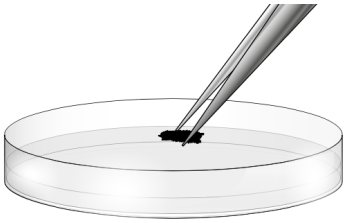
Diffusion still occurs in liquids but is s_____ than in a gas because the particles have less e_____. The rate of d_____ in liquids can be increased by h_____ the liquid.

Diffusion in s_____ only occurs if the solids are soluble in a liquid. The particles in insoluble solids are packed t_____ together and are unable to m_____.

Answers

4. Observe for 5 minutes.

5. Repeat the experiment using hot water.



Observations:

In cold water: **The $KMnO_4$ slowly diffuses into the water turning it purple.**

In hot water: **The $KMnO_4$ rapidly diffuses into the water.**

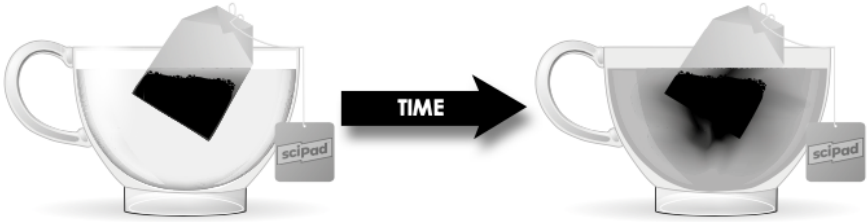
Explanation: **The particles in hot water are moving about more quickly than the particles in the cold water. This increased particle movement increases the rate of diffusion.**

1. Using the words and phrases below, explain the following observations:

particles	high concentration	low concentration	diffusion

(a) If a tea bag is left undisturbed in a cup of water, the water will eventually darken.

Inside the tea bag there is a high concentration of tea particles. Outside the tea bag there is a low concentration of tea particles. The tea particles will diffuse from an area of high concentration to an area of low concentration.



(b) If a rock is placed into a glass of water, the rock will not diffuse into the water.

Although there is a high concentration of rock particles inside the rock, it will not diffuse into the water because the rock is not soluble.

2. Complete the following sentences.

Diffusion occurs fastest in g**ases** because the particles have more space and therefore m**ove** around more.

Diffusion still occurs in liquids but is s**lower** than in a gas because the particles have less e**nergy**. The rate of d**iffusion** in liquids can be increased by h**eating** the liquid.

Diffusion in s**olids** only occurs if the solids are soluble in a liquid. The particles in insoluble solids are packed t**ightly** together and are unable to m**ove**.