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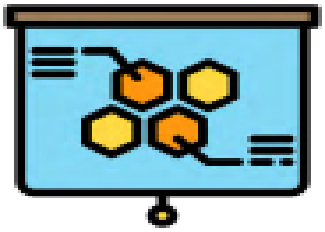
THE PARTICLE THEORY OF MATTER



What is the Particle Theory of Matter?

The Particle Theory of Matter, which has 6 points, is used to help people understand matter and how matter changes and interacts with each other.

1. Matter contains particles.
2. Particles are identical if they are of the same element (e.g., the elements of oxygen will always be identical).
3. These particles continuously move. Their movement, though, depends on their state.
4. Temperature also impacts how particles move. Particles move quickly when they're warmed, and slowly when they're cold.
5. Each state of matter has space between the particles. This is because the particles are attracted to one another. This is also known as the force of attraction.
6. The space in solids are very small. In liquids, there is a little bit more space between particles, and even more space in gases.

How does this relate to density?

Since density looks at how much mass is in a volume, the particle theory can help describe density. A dense solid's particles are tightly combined, whereas a gas has a lot of space in between the particles, making it much less dense.

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THE PARTICLE THEORY DRAWING ACTIVITY

Instructions: Use the three empty beakers below to draw what the particles look like in a solid, liquid, and gas.

Solid

Liquid

Gas

Matter

Matter - is anything that has mass and takes up space (everything around you, including you). It has 3 forms Solid, Liquid or Gas.

Particle Theory of Matter

- All matter is made up of very tiny particles.
- All particles in a pure substance are the same but different from another substance.
- There are spaces between the particles.
- The particles are always moving. They move faster if they gain energy(Heat).
- There are attractions between particles. Some are weak and some are strong.

Matter has 3 states

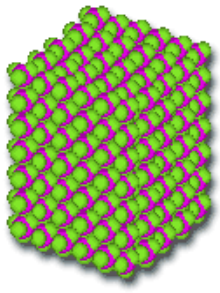
Look at this picture of 7Up in a glass with ice.

What are the 3 states of matter in this picture?

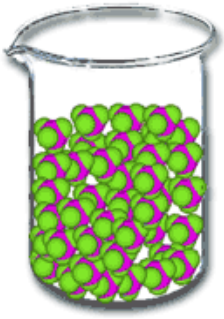
3 States of Matter

Copy the chart

State	Shape	Volume	Particle arrangement	Particle movement
1. Solid	Definite	Definite	Close	Vibrate
2. Liquid	Indefinite	Definite	Close	Free flowing
3. Gas	Indefinite	indefinite	Far Apart	Random



Solid



Liquid

Gas

particles tightly packed, like bees in a hive. Greatly effected by gravity, that is why solids fall to the ground. Vibrate since cannot move around freely.

Particles in liquid have enough energy to pull away from each other, while at the same time vibrating close together in small clusters. Relate this to a group of people talking at a party. They can move around as a group, or flow in between other groups.

Still effected by gravity. falls downward

Diffusion of food coloring in water

Particles are so far apart and they have lots of energy.

Sometimes goes against gravity.

Takes shape of any container or room it is in.

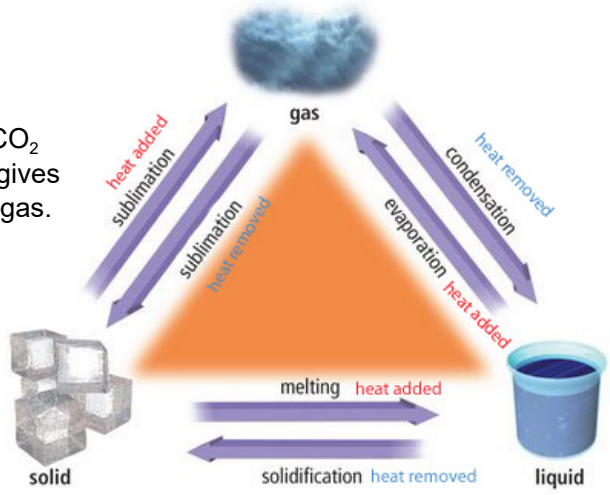
Remember diffusion of perfume

Changing States

Change of state is when the physical state of a substance is transformed into another state. Copy the diagram below and discuss.

Ex) Dry Ice

Chunk of Frozen CO_2 gains energy and gives off a cloud of CO_2 gas.



Changes of state

Chemistry experiment 47 - Sublimation of Iodine - YouTube

NEXT »

While dry ice looks like it would be cold, it's extremely dangerous to the touch and can cause severe burns.

Dry ice is **frozen carbon dioxide**. A block of dry ice has a surface temperature of -109.3 degrees Fahrenheit (-78.5 degrees C). Dry ice also has the very nice feature of **sublimation** -- as it breaks down, it turns directly into carbon dioxide gas rather than a liquid. The super-cold temperature and the sublimation feature make dry ice great for refrigeration. For example, if you want to send something frozen across the country, you can pack it in dry ice. It will be frozen when it reaches its destination, and there will be no messy liquid left over like you would have with normal ice.

Fun Fact What is the difference between a gas and a vapor?

-A substance is a gas if it exist as a gas at room temperature (Ex. Carbon Dioxide & Oxygen)

-A substance is a vapor if it exist as a solid or liquid at room temperature (Ex. Water vapor or perfume vapors)

Attachments

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