Chemistry
Chapter 13, 14, and 15 Jeopardy

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Round 1 – Chapter 13 and 15

Gases	Liquids	Solids	Phase Changes	Water	Mixtures
100	100	100	100	100	100
200	200	200	200	200	200
300	300	300	300	300	300
400	400	400	400	400	400
500	500	500	500	500	500

Round 2 – Chapter 14

Click to go to Round 2

Gases 100

What device is used to measure pressure?

barometer

Gases 200

What is the SI unit for pressure?

pascal

Gases 300

What causes pressure?

The collisions of particles.

Gases 400

Convert 976 mm Hg to kPa.

128.9 kPa

Gases 500

What are the 4 parts of the kinetic theory?

1. Gas particles have insignificant volume.
2. Gas particles have no attractive or repulsive forces.
3. Gas particles are constantly and randomly moving.
4. The collisions between gas particles are perfectly elastic.

Liquids 100

What is the definition of vapor pressure?

The force exerted by a gas over a liquid.

Liquids 200

What is the SCIENTIFIC definition of boiling point?

The point at which the vapor pressure of a liquid equals external pressure.

Liquids 300

How does boiling point change with altitude?

As altitude increases, boiling point decreases. As altitude decreases, boiling point increases.
They are inversely proportional.

Liquids 400

What is a fluid and what states of matter are considered fluids?

A fluid is any substance that flows. Liquids and gases are fluids.

Liquids 500

Explain how evaporation is a cooling process.

The particles with the most kinetic energy (speed) evaporate first. This leaves the particles with lower kinetic energy (speed). Since kinetic energy is directly proportional to temperature, then the temperature of the slower particles is lower.

Solids 100

Are the particles in a solid moving?

Yes

Solids 200

What is a unit cell?

A unit cell is the smallest part of a crystal that retains the geometric shape of the crystal.

Solids 300

What is an allotrope and give an example?

An allotrope is more than one form of an element.
Ex: Carbon – diamond, graphite, bucky ball

Solids 400

What is a crystal?

A crystal is any substance with an orderly 3-D repeating pattern called a crystal lattice.

Solids 500

What is a glass? BE SPECIFIC!!

A glass is an amorphous solid that is a super-cooled liquid.

Phase Changes 100

What is sublimation?

Sublimation is the change of a solid directly to a vapor without passing through the liquid phase.

Phase Changes 200

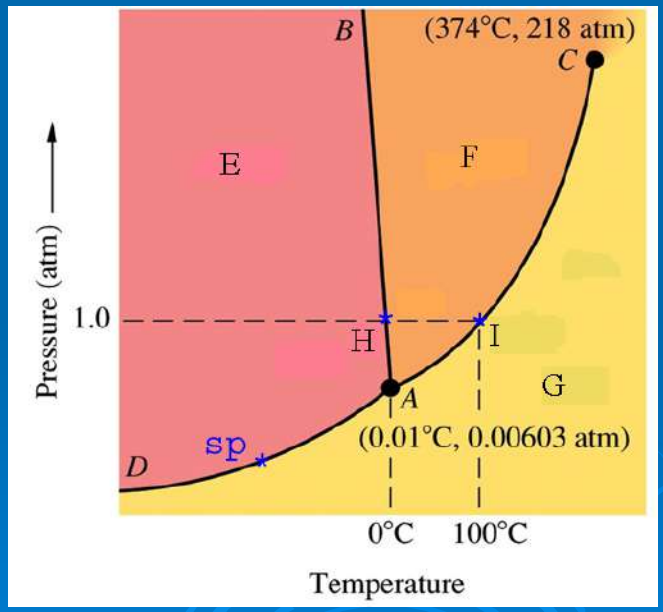
What is deposition?

Deposition is the change of a gas to a solid without passing through the liquid phase.

Phase Changes 300

What is the triple point and where is it found on the phase diagram?

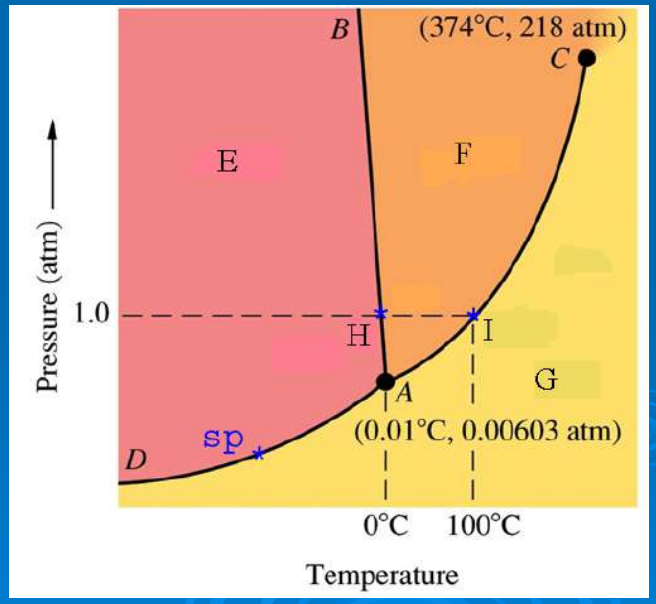
The triple point is the only set of temperature and pressure in which all 3 states of matter exist in equilibrium. The triple point is point A.



Phase Changes 400

Where would on the phase diagram would a solid be located?

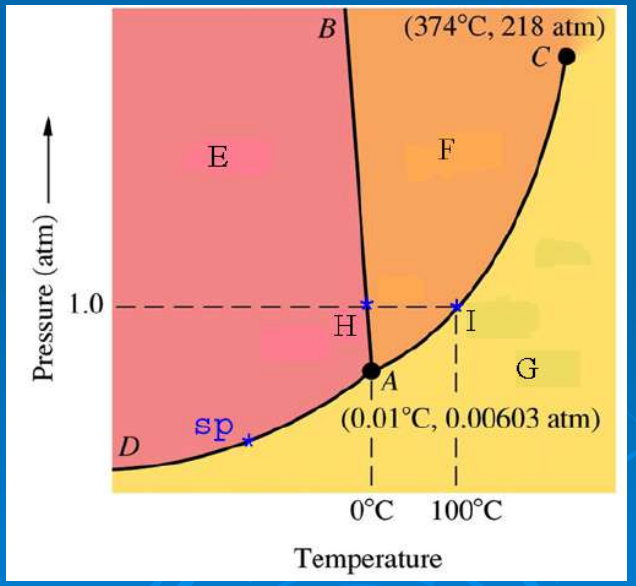
Area E



Phase Changes 500

Where would the normal boiling point of a liquid be located on the phase diagram?

Point I



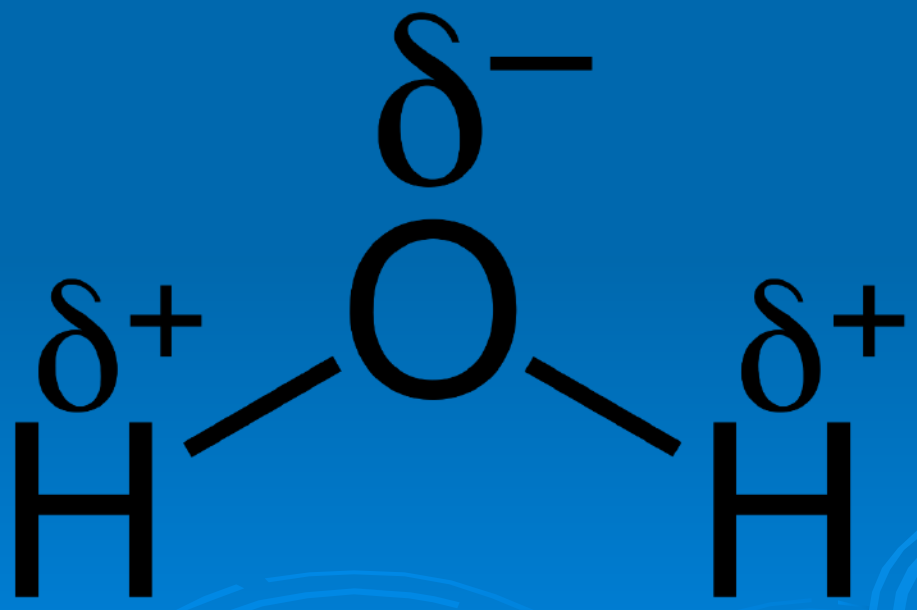
Water 100

What causes the high surface tension and low vapor pressure of water?

Hydrogen bonding

Water 200

Label the δ+ and δ- side of a water molecule.



Water 300

What is the shape that water molecules form in ice?

Honeycomb

Water 400

What is an aqueous solution?

A homogeneous mixture in which the solvent is water.

Water 500

Why is ice less dense than water?

Water is more dense because the water molecules can get closer together. When the water molecules freeze, they form an open honeycomb structure in order to maximize the number of hydrogen bonds. This open structure causes ice to be less dense.

Mixtures 100

What is an example of a suspension?

Italian salad dressing
Some medicines
Some paints
(anything that settles over time)

Mixtures 200

What is the difference in a solution, a suspension, and a colloid?

A solution has small particles. A colloid has medium-sized particles. A suspension has large particles.

Mixtures 300

What is an electrolyte?

An electrolyte conducts electricity when dissolved in water.

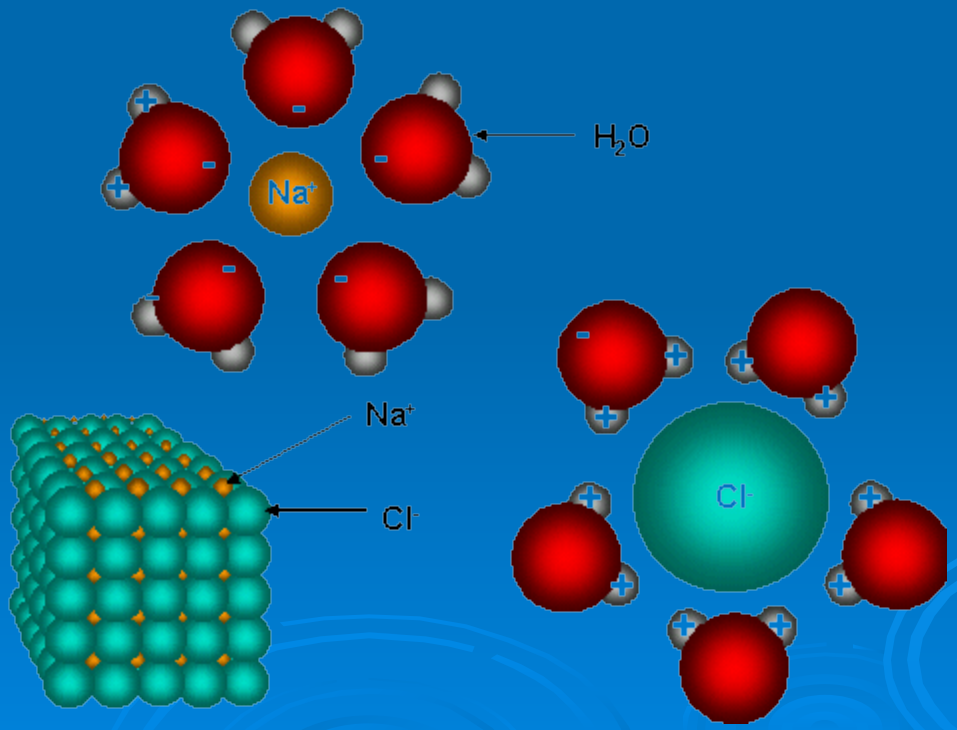
Mixtures 400

Write the formula for copper (II) sulfate pentahydrate.

$CuSO_4 \cdot 5H_2O$

Mixtures 500

Draw a diagram of an ionic compound dissolving in water.



Boyle's Law	Charles' Law	Gay-Lussac's Law	Combined Gas Law	Ideal Gas Law	Dalton and Graham's Law
200	200	200	200	200	200
400	400	400	400	400	400
600	600	600	600	600	600
800	800	800	800	800	800
1000	1000	1000	1000	1000	1000

Boyle's Law 200

What two conditions are described in Boyle's Law?

Pressure and Volume

Boyle's Law 400

If pressure doubles, what happens to volume?

Volume is cut in half.

Boyle's Law 600

A sample of oxygen gas occupies a volume of 780 mL at 450 torr. What volume will it occupy at 200 torr pressure?

1755 mL

Boyle's Law 800

Ammonia gas occupies a volume of 839 mL at a pressure of 693 mm Hg. What volume will it occupy at standard pressure?

765.04 mL

Boyle's Law 1000

A 5.3L container of nitrogen has a pressure of 7.1 atm. What volume would be necessary to decrease the pressure to 336 kPa?

11.27 L

Charles' Law 200

What two conditions are described by Charles' law?

Temperature and Volume

Charles' Law 400

If Kelvin temperature is halved, what happens to volume?

Volume is cut in half.

Charles' Law 600

Hydrogen gas was cooled from 230°C to 79°C. Its new volume is 50mL. What was its original volume?

71.45 mL

Charles' Law 800

A sample of neon gas at 78°C and a volume of 3.1L is cooled to standard temperature. What is the new volume?

2.41L

Charles' Law 1000

A sample of nitrogen occupies a volume of 400mL at 80°C. What volume (in liters) will it occupy at 110°C?

0.43L

Gay-Lussac's Law 200

What conditions are described by Gay-Lussac's law?

Temperature and Pressure

Gay-Lussac's Law 400

If pressure is tripled, what happens to Kelvin temperature?

Temperature is tripled.

Gay-Lussac's Law 600

The gas in a closed container has a pressure of 300 kPa at 30°C. What will the pressure be if the temperature is lowered to -172°C?

100 kPa

Gay-Lussac's Law 800

A contained gas is at standard temperature. The temperature is changed to 83°C, so the pressure changes to 794 torr. What was the original pressure?

608.9 torr

Gay-Lussac's Law 1000

A contained gas is at a temperature of 48°C and a pressure of 748.3 kPa. What is the new temperature if pressure is changed to 330.8 mm Hg?

18.91K

Combined Gas Law 200

What conditions are described by the combined gas law?

Temperature, Pressure, and Volume

Combined Gas Laws 400

What is STP?

Standard Temperature and Pressure

Standard Temperature = 0°C

Standard Pressure = 1 atm or any of the numbers in the conversion factor

Combined Gas Law 600

A gas occupies 300mL at 85°C and 320 torr. What is the new pressure if temperature is changed to 120°C and volume is changed to 280mL?

376.38 torr

Combined Gas Law 800

A gas occupies a volume of 600mL at 20°C. The conditions are changed to 500mL at STP. What was the original pressure?

0.89 atm

Combined Gas Law 1000

A gas is at a temperature of 98°C and a pressure of 86 kPa. The conditions are changed to 900mL at 778 torr and 120°C. What was the original volume?

1024.5 mL

Ideal Gas Law 200

What does n stand for?

Number of moles

Ideal Gas Law 400

What is the value and UNITS for R?

8.31 $\frac{\text{L·kPa}}{\text{mol·K}}$

Ideal Gas Law 600

How many moles of oxygen will occupy a volume of 3.9L at 7.8 atm and 40^{o}C?

1.18 mol

Ideal Gas Law 800

How many moles of nitrogen gas will occupy a volume of 347mL at STP?

0.015 mol

Ideal Gas Law 1000

At what temperature will 5.00g of perchloric acid exert a pressure of 840 mm Hg at a volume of 300mL?

80.8K

Dalton and Graham's Laws 200

Who created the law of partial pressures?

Dalton

Dalton and Graham's Laws 400

What is diffusion and effusion?

Diffusion is the tendency of gas particles to move from areas of high concentration to areas of low concentration until all concentration is uniform. Effusion is the same but deals with a gas escaping from a container through a tiny hole.

Dalton and Graham's Law 600

Determine the total pressure if P_{O2} = 30kPa, P_{N2} = 53kPa, and P_{He} = 31.7kPa.

114.7kPa

Dalton and Graham's Laws 800

Determine the partial pressure of carbon dioxide in a sample at a pressure of 32.9kPa if P_{O2} = 6.6kPa and P_{N2} = 23kPa.

3.3kPa

Dalton and Graham's Laws 1000

Determine the ratio of diffusion for helium gas and fluorine gas.

Helium gas diffuses 3.08 times faster than fluorine gas.