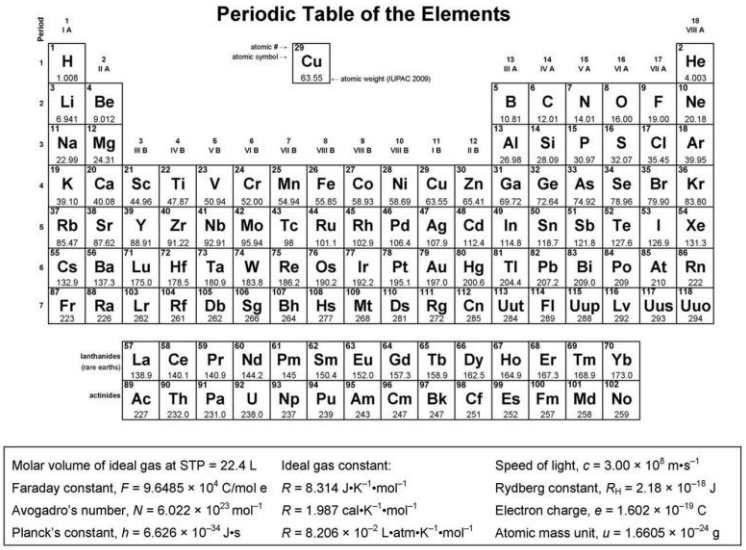
CHE 105 Exam 1 Fall 2016

Your Name: _____ **Your ID:** _____



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Question #: 1

The state of matter in which atoms or molecules have a fixed volume but are free to move relative to each other is a __1__ [solid, liquid, gas].

1. _____

Question #: 2

Match the substance (1-4) with an appropriate description (A-D).

__1__ Aluminum
__2__ Noodle soup
__3__ Tea
__4__ Table salt

A. Compound
B. Element
C. Homogeneous mixture
D. Heterogeneous mixture

1. _____

2. _____
3. _____
4. _____

Question #: 3

Which of the following processes describes a **chemical** change?

A. Irons rusts when exposed to air.
B. Water evaporates on a hot day.
C. Ice cubes placed in a glass of water melt over time.
D. Water placed in a freezer becomes solid ice.

Question #: 4

Which statement about energy is **false**?

A. Potential energy is associated with the position or composition of an object.
B. Kinetic energy is associated with the motion of an object.
C. Energy cannot be created or destroyed.
D. Thermal energy is a form of potential energy.

Question #: 5

You are running late for class and have 5.01 km to run before you reach the classroom. How many μm do you have to travel?

A. 5.01×10^{9} -μm
B. 5.01×10^{8} -μm
C. 5.01×10^{14} -μm
D. 5.01×10^{-4} -μm

Question #: 6

Write the number 5715 in proper scientific notation.
Report your answer with the format 2.222E2 or 2.222E-2.
__1__

1. _____

Question #: 7

If a car travels 2.5419×10^5 m, and then an additional 2.38×10^3 m, what is the total distance traveled?

A. 4.92×10^5 m
B. 2.5657×10^5 m
C. 4.92×10^3 m
D. 2.5657×10^3 m

Question #: 8

The density of a particular liquid is 3.12 g/mL. What volume (in mL) is occupied by 8.48 g of the liquid?
Report your answer with **three** significant figures. Do **NOT** include units in your answer.
__1__ mL

1. _____

Question #: 9

Which of the following is **not** an extensive property?

A. mass
B. melting point
C. length
D. volume

Question #: 10

How many significant figures are in 0.00389030?

A. 6
B. 7
C. 9
D. 4

Question #: 11

What is the result of the following calculation?
Report your answer to the **correct** number of significant figures. Report your answer in scientifi c notation with the format 2.2E2 or 2.2E-2.

$$\frac{(3.267 \times 10^{16})}{(2.05 \times 10^{13})} + 7.313 \times 10^{3} = \underline{\ 1\ }$$

1. _____

Question #: 12

A cyclist rides at an average speed of 6.8 $\times 10^{-2}$ kilometers per second (km/s). This speed is equal to __1__ centimeters per hour (cm/h).
Report your answer with **two** significant figures. Do **NOT** include units in your answer.
Report your answer in scientific notation with the format 2.2E2 or 2.2E-2.

1. _____

Question #: 13

The density of a particular stainless steel alloy is 0.279 lb/in^3 at 20.0°C.

If a ball bearing made of this alloy weighs 8.28 g, what is the volume of the bearing in cm^3?

A. 486 cm^3
B. 1.07 cm^3
C. 0.0258 cm^3
D. 21.4 cm^3

Question #: 14

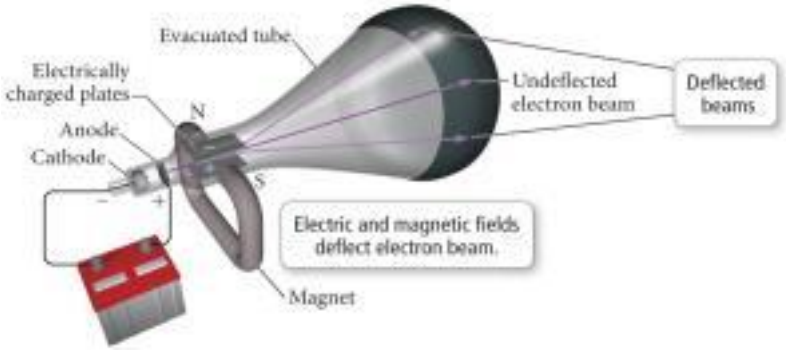
Which of the following concepts was **not** a part of Dalton's atomic theory?

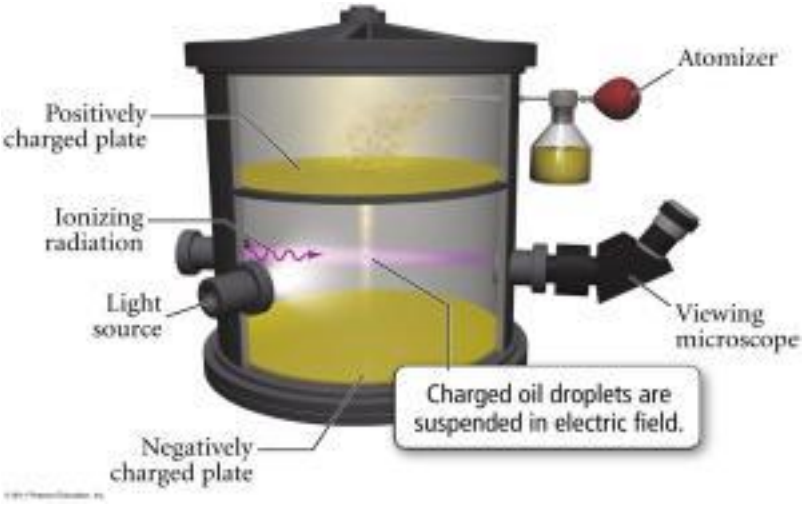
A. Law of multiple proportions
B. Law of definite prorportions
C. Isotopes
D. Elements are composed of atoms.

Question #: 15

Match the experiments (A or B) shown below with the result(s) of the experiment.
__1__ Measured the charge of an electron
__2__ Measured the mass-to-charge ratio of an electron
__3__ Discovered the electron

A. B.





1. _____
2. _____
3. _____

Question #: 16

Select **two** choices.
Rutherford's experiment in which alpha particles were incident on a gold foil demonstrated that

A. Thomson's plum pudding model is an incorrect picture of the structure of the atom.
B. the atom is very dense and contains little empty space.
C. the nucleus contains most of the mass of the atom.
D. the core of the atom is negatively charged.

Question #: 17

Select the **three true** statements about subatomic particles in atoms.

A. Electrons and protons have approximately the same mass.
B. Protons and electrons have charges of opposite sign.
C. Neutrons and protons have approximately the same mass.

D. The atomic number of an element is equal to the number of protons in each atom of that element.
E. Neutrons and protons have approximately the same charge.

Question #: 18

Which statement concerning isotopes is **incorrect**?

A. Isotopes are atoms that have the same atomic number but have different numbers of neutrons.
B. The isotope ^{1}H has no neutrons.
C. The number of neutrons is determined by substracting the atomic number from the mass number.
D. The mass number is determined by adding the atomic masses of each isotope.

Question #: 19

Choose the isotope symbol for a **neutral atom** with a mass number of 46 and an atomic number of 15.

A. $^{46}_{15}P$

B. $^{15}_{46}P$

C. $^{46}_{15}Pd$

D. $^{15}_{46}Pd$

E. $^{46}_{16}S^{+}$

Question #: 20

Potassium typically forms an ion with a charge of __1__ . Include both a number (1, 2, 3, etc) and a sign (+ or -) in your answer.

1. _____

Question #: 21

What is the charge of an iron ion with 24 electrons? Include both a number (1, 2, 3, etc) and a sign (+ or -) in your answer.

__1__

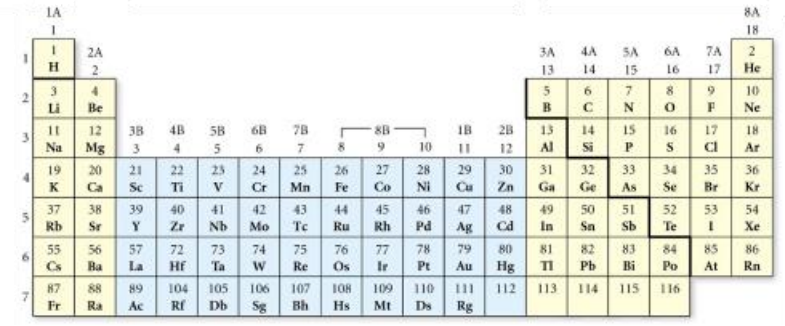
1. _____

Question #: 22

Looking at the figure below, match the group names (A-D) with their locations on the periodic table (1-4).

A. Alkali metals B. Halogens C. Noble gases D. Transition metals

__1__ Group 8A __2__ Group 7A __3__ Group 1 A __4__ Groups 1B through 8B



1. _____
2. _____
3. _____
4. _____

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Silver has two naturally occurring isotopes.
^{109}Ag has a natural abundance of 48.161% and an isotopic mass of 108.90475 amu.
What is the **isotopic mass** of the other isotope?

A. 105.2 amu
B. 106.3 amu
C. 107.0 amu
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Question #: 24

How many moles are present in 13.9 g of lithium?

A. 13.9 mol
B. 2.00 mol
C. 0.500 mol
D. 6.94 mol

Question #: 25

A piece of copper wire contains 8.29×10^{22} atoms of copper.
How many **moles** of copper are in the wire?

A. 1.30×10^{21} mol
B. 4.99×10^{46} mol
C. 0.138 mol
D. 8.71 mol

Question #: 26

A solid silver ring has a mass of 7.84 g. How many silver atoms are in the ring?

A. 4.38×10^{22} atoms
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C. 8.45×10^{3} atoms
D. 4.72×10^{24} atoms

Question #: 27

Fill in the blanks with either **covalent** or **ionic**.
In a(n) __1__ bond, electrons are transferred from one atom to another.
Nonmetals typically form __2__ bonds with other nonmetals.
Metals typically form __3__ bonds with nonmetals.

1. _____
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Question #: 28

What is the empirical formula for $C_6H_{12}O_6$?

A. CHO
B. $C_2H_4O_2$
C. CH_2O
D. $C_{12}H_{24}O_{12}$

Question #: 29

Select the **two** molecular compounds below.

A. CH_2Cl_2
B. K_2O
C. Fe_2O_3
D. SF_6

Question #: 30

Lead has a density of 11.4 g/cm^3. How many atoms are present in a sample of lead with a volume of 25.0 cm^3?
Report your answer with **three** significant figures. Do **NOT** include units in your answer.
Report your answer in scientific notation with the format 2.22E2 or 2.22E-2.
__1__ atoms

1. _____

DRAFT

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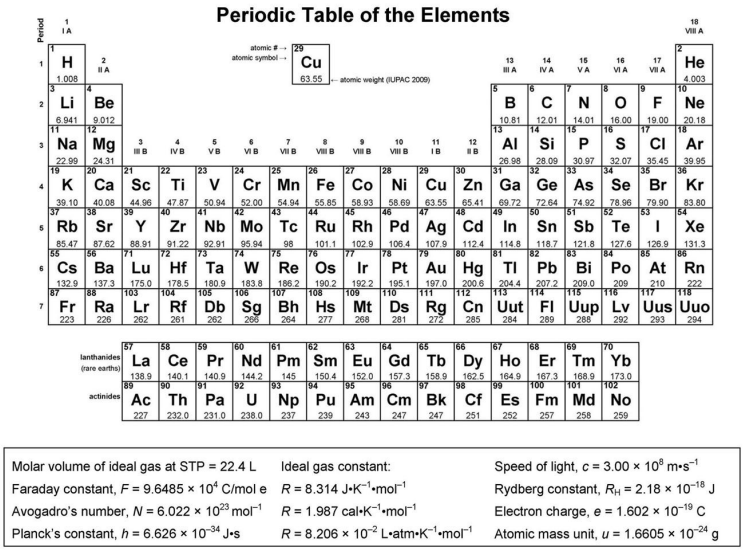

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The state of matter in which atoms or molecules have a fixed volume but are free to move relative to each other is a __1__ [solid, liquid, gas].

1. liquid|Liquid|

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1. B.|B|b|b.|
2. D.|D|d|d.|
3. C.|C|c|c.|
4. A.|A|a|a.|

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1

1. 5.715E3|5.715 E 3|

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1 mL

1. 2.72|2.71|2.73|

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1. 8.91E3|8.91e3|

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1. 2.4E7|2.4 E 7|2.4E 7|2.4 E7|

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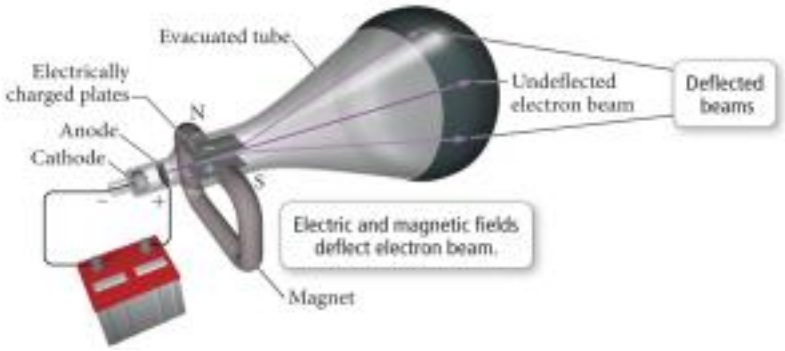

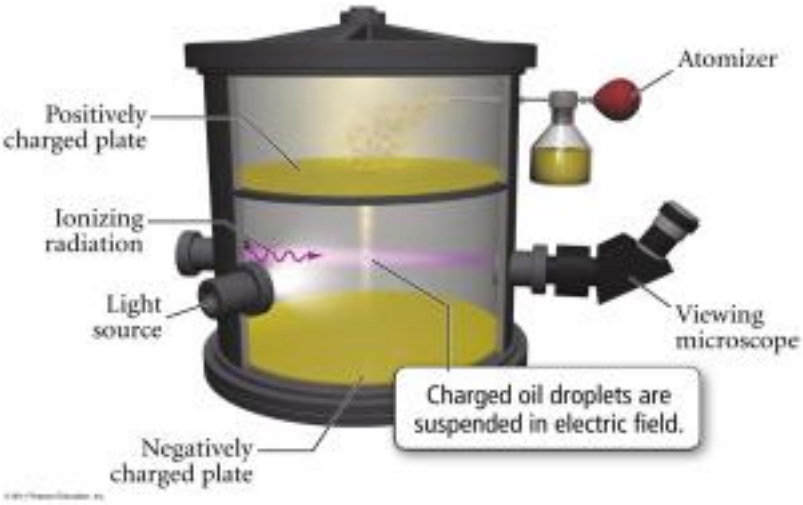

1. B
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__1__

1. 2+|+2|two plus|plus two|2 plus|plus 2|

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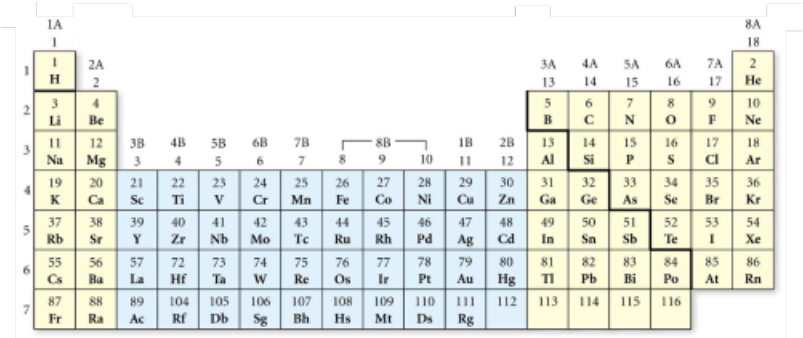

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1. ionic
2. covalent
3. ionic

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D. $C_{12}H_{24}O_{12}$

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__1__ atoms

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