

Grudge Ball

Spring Final Review: Semester 1 plus Chapter 8

GRUDGE BALL RULES

Each team gets 10Xs

Teams will take a turn answering a review question. Correct answers get you 2Xs to take from any team (splitting is ok) and a shot at the hoop.

Successful shot from the:

1 point line = +1x (3 total)

2 point line = +2X (4 total)

3 point line = +3X (5 total)

GRUDGE BALL RULES

Most Xs at the end of game wins.

If your team has no Xs left, can gain back Xs by answering the question correctly.

If team gets incorrect answer, random choice gets to steal the Q, so BE READY!

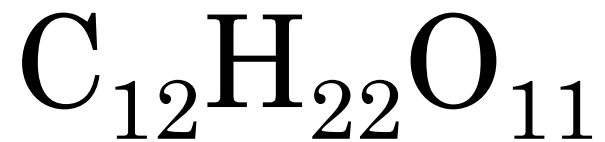
#1 - How many atoms are in
one molecule of
 $\text{Mg}_3(\text{PO}_4)_2$?

Thirteen (13)

#2 - What particle did
Thompson discover and name
his experiment that proved it.

Electron → Cathode Ray Tube
Experiment

#3 - What is the empirical formula for the following molecule: $\text{C}_{12}\text{H}_{22}\text{O}_{11}$?

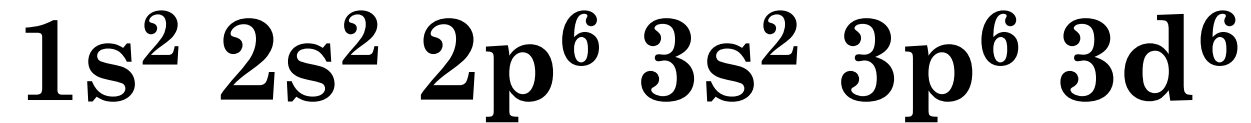


#4 - This is the electron configuration for what element?

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$

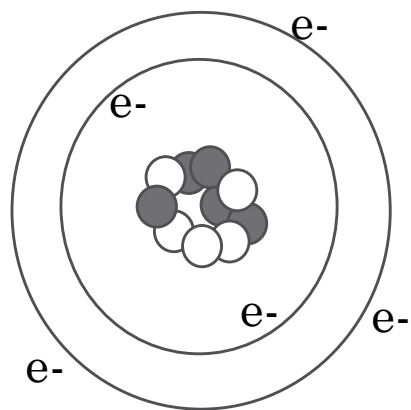
Iron (Fe)

#5 - This is the electron configuration for what ion?



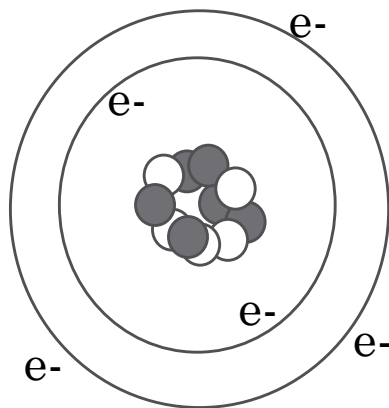
Iron (II), (Fe^{2+})

#6 - Do any of the following atoms represent isotopes of Atom A? If so, which ones and why?



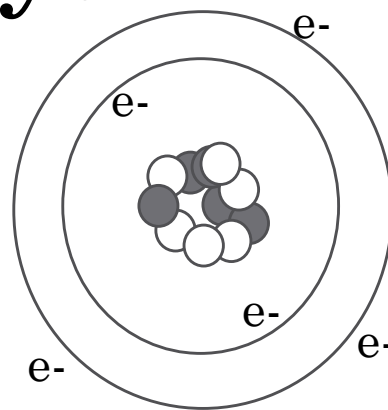
Atom A

5 protons
5 neutrons
5 electrons



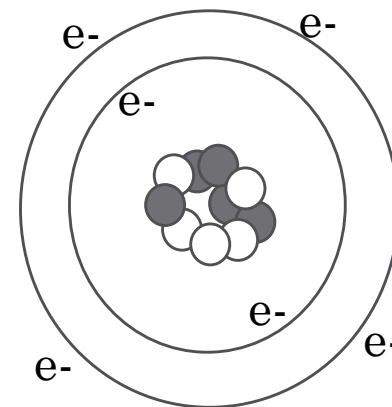
Atom B

6 protons
5 neutrons
5 electrons



Atom C

5 protons
6 neutrons
5 electrons



Atom D

5 protons
5 neutrons
6 electrons

#7 - What is the percent composition of CH_4 ?

C: 74.9%

H: 25.1%

#8 - Give the name and write out the noble gas notation for the element below.



[Kr] 5s² (Strontium)

#9 - Adipic acid contains 49.32% C, 43.84% O, and 6.85% H by mass. What is the empirical formula of adipic acid?



#10 - Name the states of matter

Solid, liquid, gas, and plasma

#11 - Name all phase changes and give an example of each.

Melting – Solid to Liquid

Freezing – Liquid to Solid

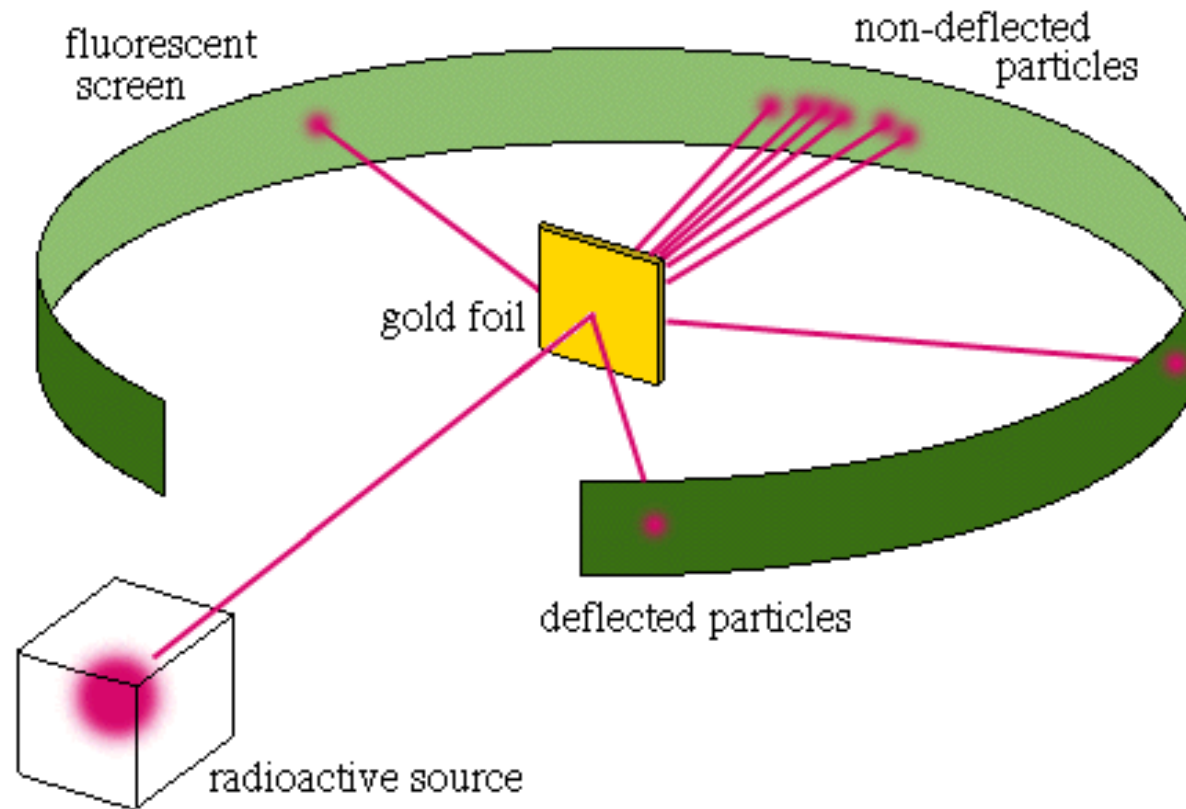
Condensing – Gas to Liquid

Sublimation – Solid to Gas

Deposition – Gas to Solid

Vaporizing – Liquid to gas

#12 - Draw a Diagram for Rutherford's Experiment and Explain what it proved about the atomic model.



#13 - What does Hund's Rule say about electron orbitals?

Orbitals of the same energy must have one electron in each before any can have two (siblings want their own rooms before they have to share!)

#14 - Name an element with
similar properties to
Magnesium.

Beryllium, Calcium, Strontium, Barium,
Radium

(any alkaline earth metal)

#15 - How do you calculate mass number?

Protons + neutrons = mass number

#16 - How many valance Electrons
do the alkali metal elements have?

One

#17 - Show the right energy level diagram for carbon and how many unpaired electrons does it have?

• $\underline{\uparrow} \quad \underline{\uparrow} \quad \underline{\quad}$

• $\underline{\uparrow\downarrow}$

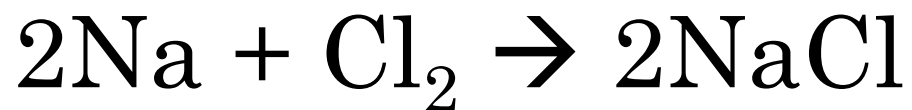
• $\underline{\uparrow\downarrow}$

#18 - Compare and Contrast a chemical and physical change and give an example of each.

Physical change is same substance before and after (boiling water), but a chemical change involves the making and breaking of chemical bonds (combustion, rusting, etc)

#19 - If you have 29.5 moles of sodium and 27.0 moles of chlorine gas, how many moles of sodium chloride can you produce?

Beware of diatomic molecules!



Limiting reagent problem!

Can make 29.5 moles NaCl

#20 - Classify all of the following
Substances as Pure (element or
compound) or a mixture
(homogenous or heterogeneous).

Calcium

NEON

Cookies and Cream Ice
cream

KOOL AID

Carbon Dioxide

H₂O

Tap Water

SALAD DRESSING

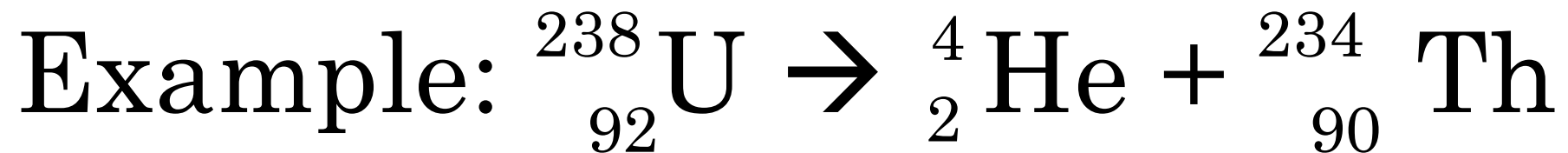
<u>Pure Substance</u>		<u>Mixture</u>	
Element	Pure Comp	Homogenous	Heterogeneous
Calcium	H ₂ O	KOOL	SALAD
Neon	CARBON	AID	DRESSING
	DIOXIDE	TAP	COOKIES
		WATER	AND
			CREAM
			ICE
			CREAM

#21 - What is an alpha particle? Provide the symbol, mass, charge, and an example of an element undergoing an alpha decay.



Mass: 4 amu

Charge: 2+



#22 - How many orbitals in the
s,p,d,f shapes?

1, 3, 5, 7

#23 - How many valence electrons do the halogens have and what is the charge of their ions?

7, 1-

#24 - What radioactive emission changes a proton into a neutron?

Positron

#25 - The half-life of thorium-227 is 18.72 days How many days are required for three-fourths of a given amount to decay?

37.44 days

#26 - What radioactive emission changes a neutron into a proton?

Beta Emission

#27 - How many protons and neutrons are in the nuclei of Tl-204 atoms?

81 protons and 123 neutrons

#28 - What does the Pauli Exclusion Principle say?

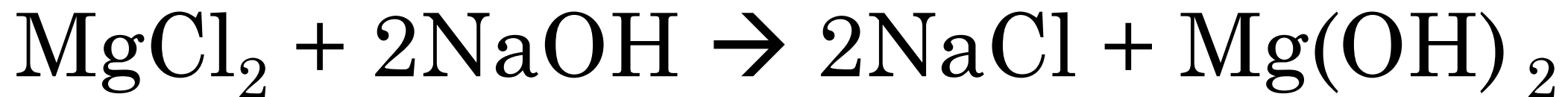
No two electrons can have the same set of quantum numbers – they can't occupy the "same space"

#29 - How many unpaired electrons are in gold?

One

#30 - Magnesium chloride reacts with sodium hydroxide. Predict the products, identify what type of reaction is taking place, and balance the reaction.

Double displacement



#31 - Neutron initiated fission of U-235 results in the release of 4 beta particles, the formation of Sr-90 and the release of another nucleus. What is the other nucleus?

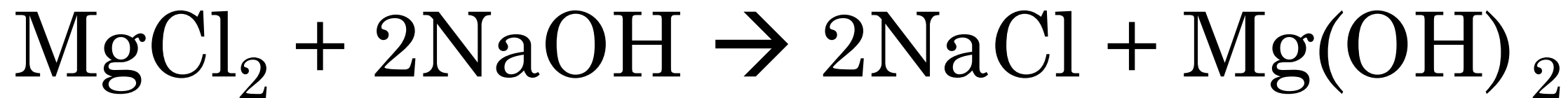
Cerium - 146

#32 - What is the highest energy level in the electron configuration below.



Fourth energy level

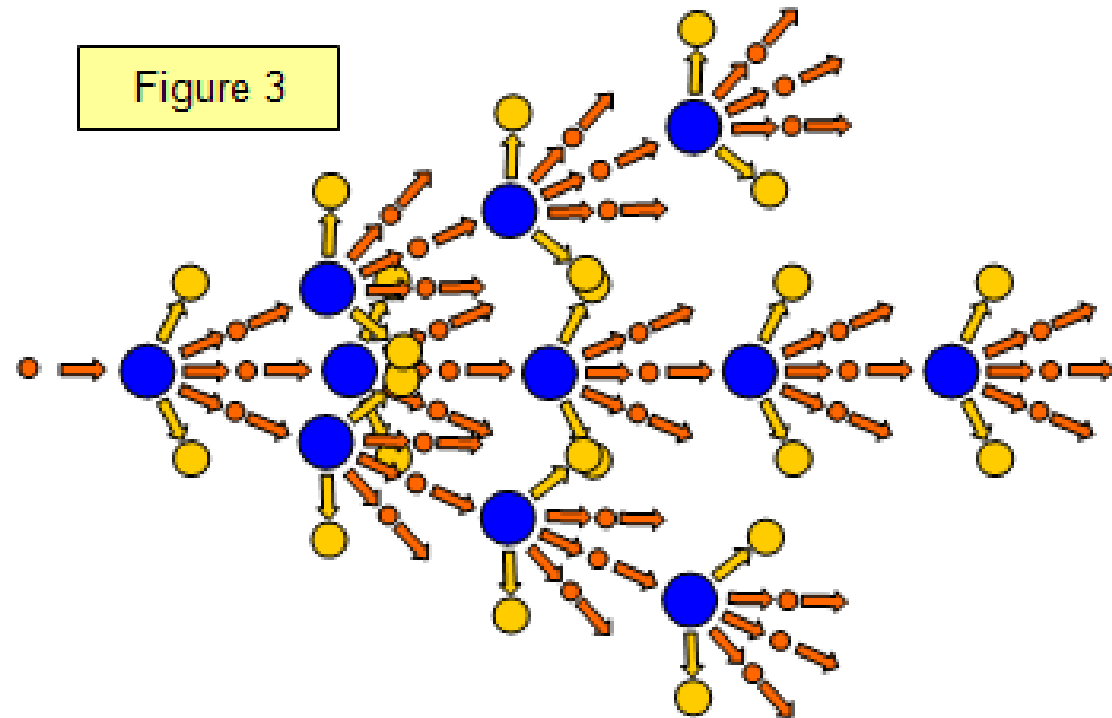
#33 - 2.5 grams of MgCl_2 is used in the following reaction. How many grams of sodium chloride can you make?



3.07g NaCl

#34 - What is nuclear fission?

A large, unstable nucleus breaking apart into smaller more stable nuclei. Usually initiated by a neutron and results in three additional neutrons being released, sometimes the result is a chain reaction.



#35 - A substance is known to have a density of 1.39g/ml. If you have 10g of this substance, what volume in L would you have?

7.2×10^{-3} L

#36 - Which element might form a ion by losing electrons from the s and d orbitals F, S, Li, Ti

Ti

#37 - How many decigrams are in 437 kg?
Write in scientific notation!

- $4.37 \times 10^6 \text{ dg}$

#38 - How many significant figures are in the following values?

612 kg

0.00067 ml

309.4 g

612 kg – 3 s.f.

0.00067 ml 2 s.f.

309.4 g 4 s.f.

#39 - What is the atomic radius and its trend on the periodic table? Explain

- Measure of the distance from the center nucleus to the outer electron. Smaller left to right larger top to bottom nuclear charge and outer energy levels.

#40 - Order these elements from smallest to largest?

Se, S, Cl Na

Cl, S, Se, Na

#41 - Of the elements in the alkaline earth metals which has the highest electronegativity

Beryllium

#42 - Why does it take less energy to remove an electron as you move down a group?

More energy levels, so electron is further from the nucleus, which means the nucleus isn't able to attract as well.

#43 - Describe the trend for reactivity of halogens.

- **Reactivity increases as you move UP the periodic table.**

#44 - What is the sum of the charges from the following atoms when they form ions?
Calcium, nitrogen, and strontium

1

$$2 + (-3) + 2 = 1$$

#45 - What is the molar mass for the hydrocarbon



421.61 g/mol

#46 - Which molecule has covalent bonding and does not require a double or triple bond?

CO_2 , CO , N_2 , Cl_2

Cl_2

#47 - What is the formula for copper (IV) sulfate?



#48 - What is the name of the compound SrO ?

Strontium oxide

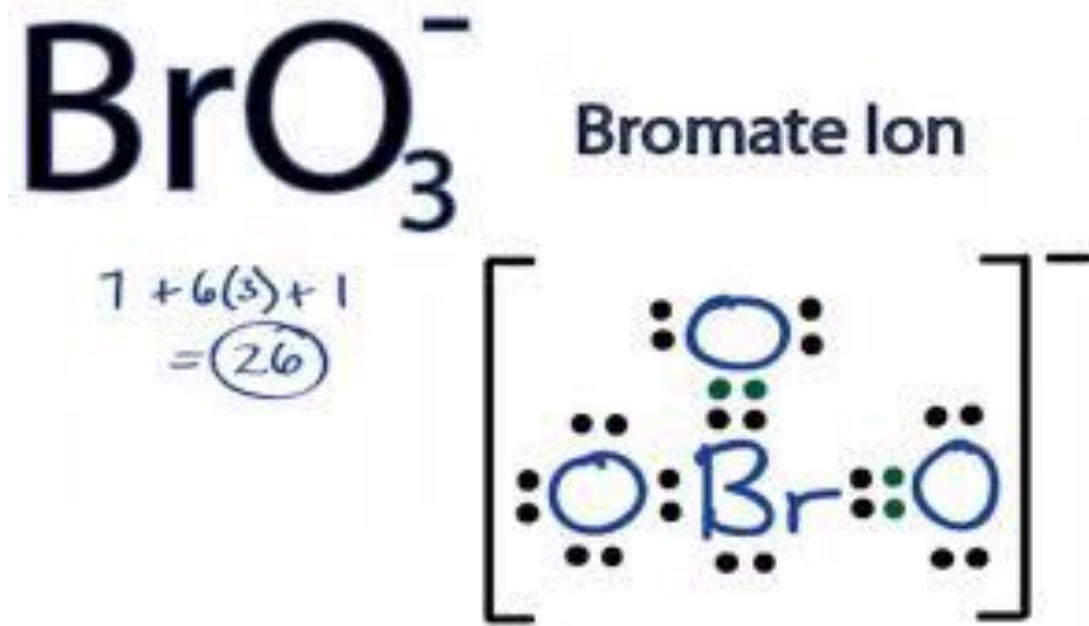
#49 - What type of bond forms between two non metals share electrons?

Covalent bond

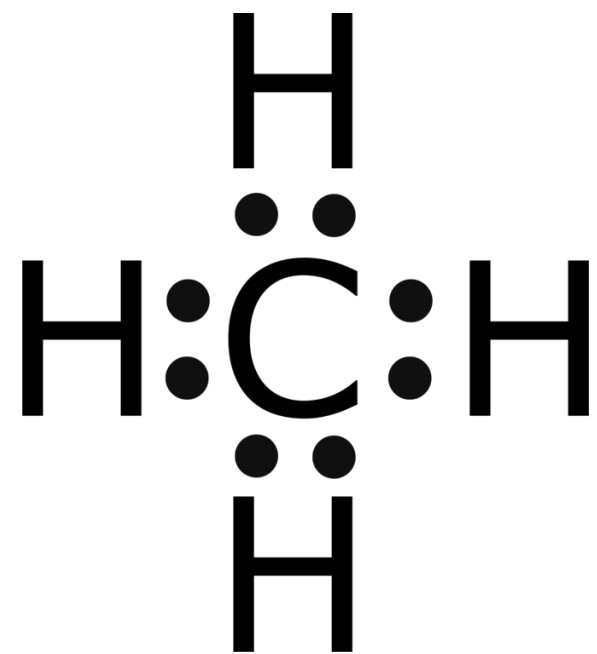
#50 - What happens to the electrons during a metallic bond?

Sea of electrons, delocalized electrons etc.

#51 - Draw the Lewis dot structure for BrO_3^-



#52 - Draw the Lewis dot structure for CH_4



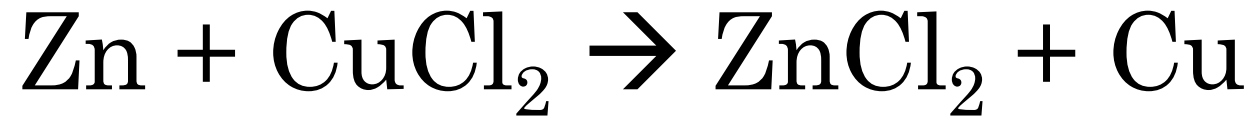
#53 - What pathway must you take in order to convert grams of substance A to moles of substance B?

Grams \rightarrow moles A \rightarrow moles B

Molar Mass of A

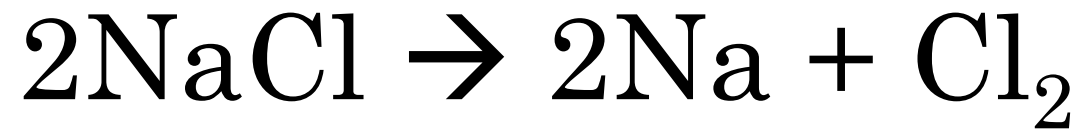
Mole Ratio

#54 - What kind of reaction is taking place below?



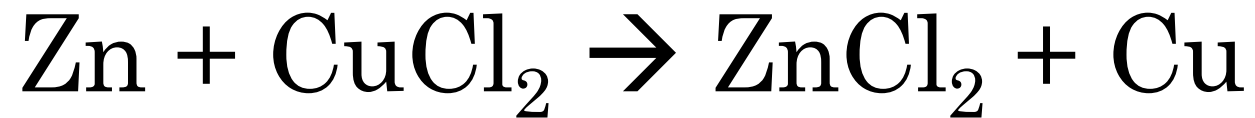
Single replacement

#55 - Sodium chloride comes apart. Name the type of reaction, predict the products, and balance the reaction.



Decomposition

#56 - What kind of reaction is taking place below?



Single replacement