

Whiteboard:

Make one column for each team, put 10 Xs in each column.

Three baskets:

closest = 1pt, middle = 2pts, far = 3pts

Weight down with beanbags

Tables:

Big whiteboards, markers, erasers

Random # generator:

Picking groups when a team gets it wrong.

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!**

Grudge Ball!

XXXXXXXXXX

Spring Final Exam Review
Semester 1 + Chapter 8

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

Thirteen (13)

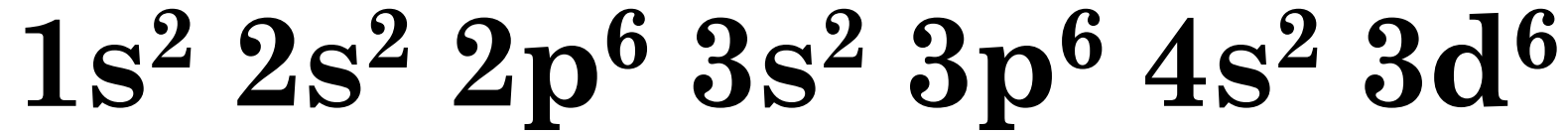
#2 - What particle did Thompson discover and name his experiment that proved it.

**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?



Iron (Fe)

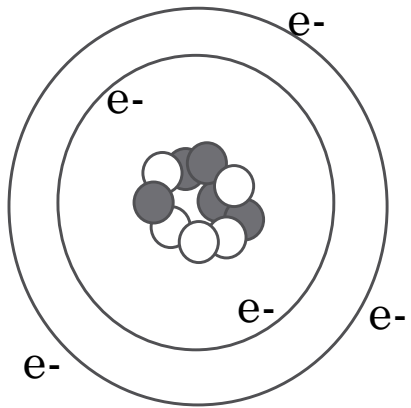
#5 - This is the electron configuration for what ion?



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

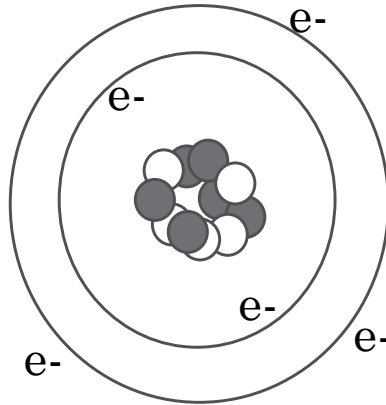
#6 - Do any of the following atoms represent isotopes of Atom A? If so, which one(s) and why?

Same protons,
different neutrons.



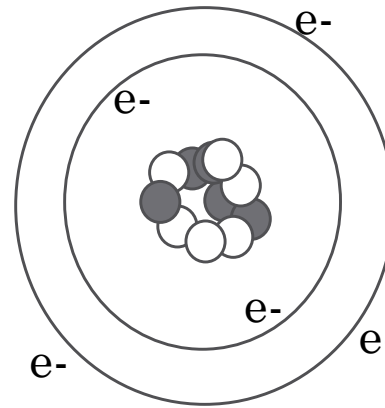
Atom A

5 protons
5 neutrons
5 electrons



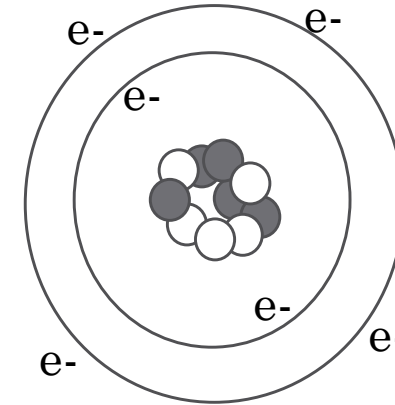
Atom B

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.

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2$

[Kr] $5s^2$ (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 **FOUR** states of matter (not phases!)

Solid, liquid, gas, and plasma

#11 - Name the SIX phase changes

Bonus X: give an example of each.

Melting – Solid to Liquid

Freezing – Liquid to Solid

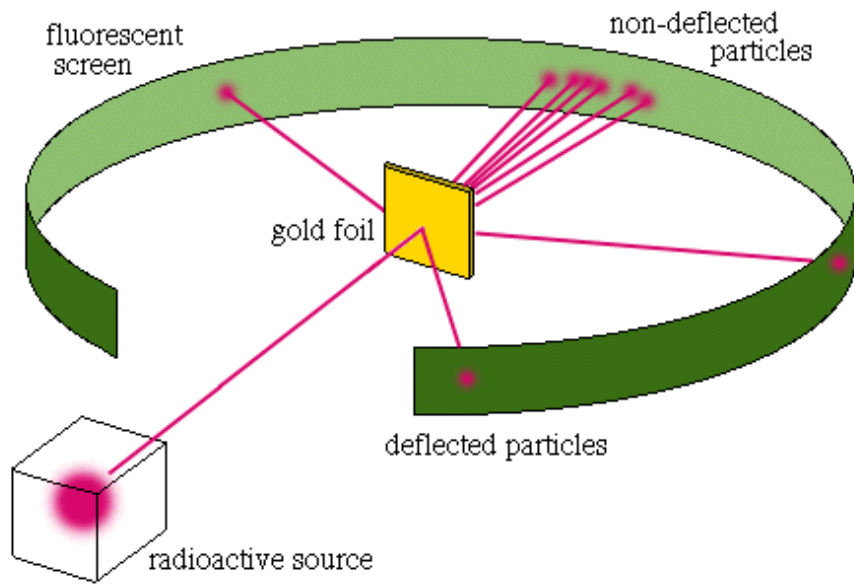
Condensing – Gas to Liquid

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.



- Nucleus is small, dense, +
- Atom mostly empty space

#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)

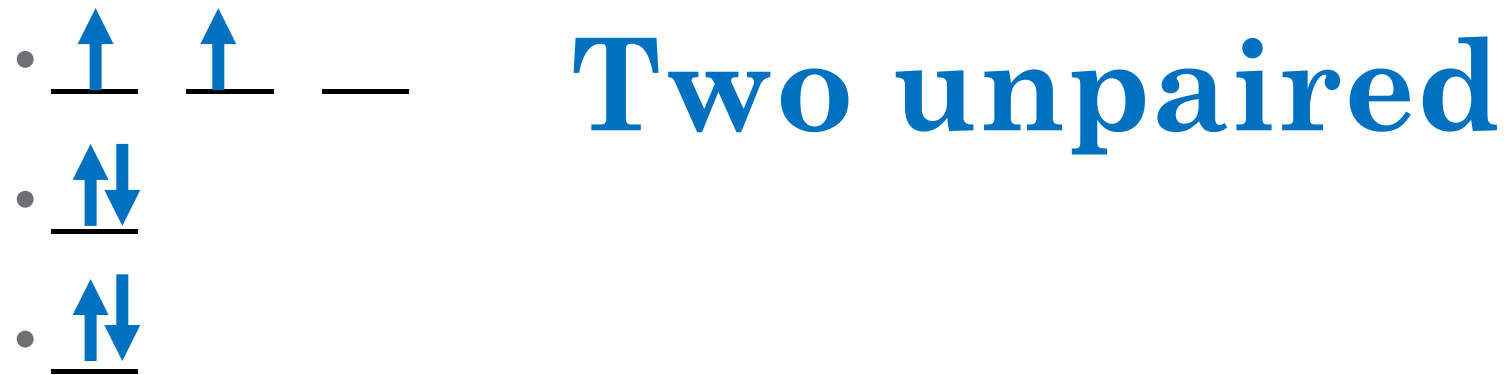
#15 - How do you calculate mass number?

**Protons + neutrons
= mass number**

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

One

#17 – Draw the energy level diagram for carbon and say how many unpaired electrons it has.



#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).

- | | |
|-----------------------------------|---------------------|
| 1. Calcium | 5. Neon |
| 2. Cookies and Cream
Ice cream | 6. Kool aid |
| 3. Carbon Dioxide | 7. H ₂ O |
| 4. Tap Water | 8. Salad dressing |

<u>Pure Substance</u>	
Element	Pure Comp

Calcium	H ₂ O
Neon	Carbon dioxide

<u>Mixture</u>	
Homog.	Heterog.

Kool aid	Salad dressing
Tap water	Cookies 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

SKIP

#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 address”

#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?

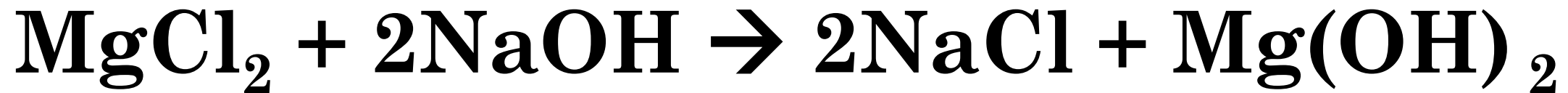
Cerium - 146

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

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$

Fourth energy level

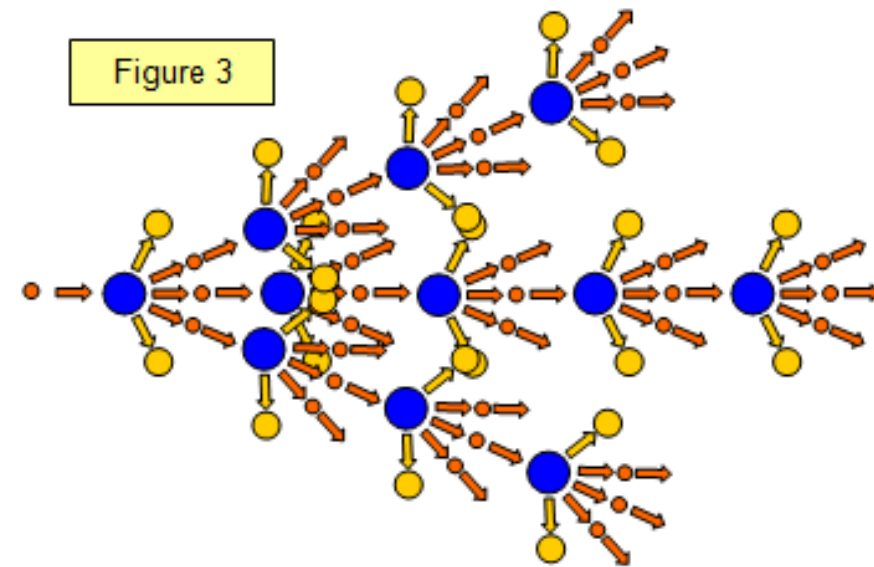
#33 - 2.5 grams of MgCl_2 is used in the following reaction. How many grams of sodium chloride can you make?



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?

$$7.2 \times 10^{-3} \text{ L}$$

#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 kilograms? Write answer 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 , CF_4

CF_4

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



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

Strontium oxide

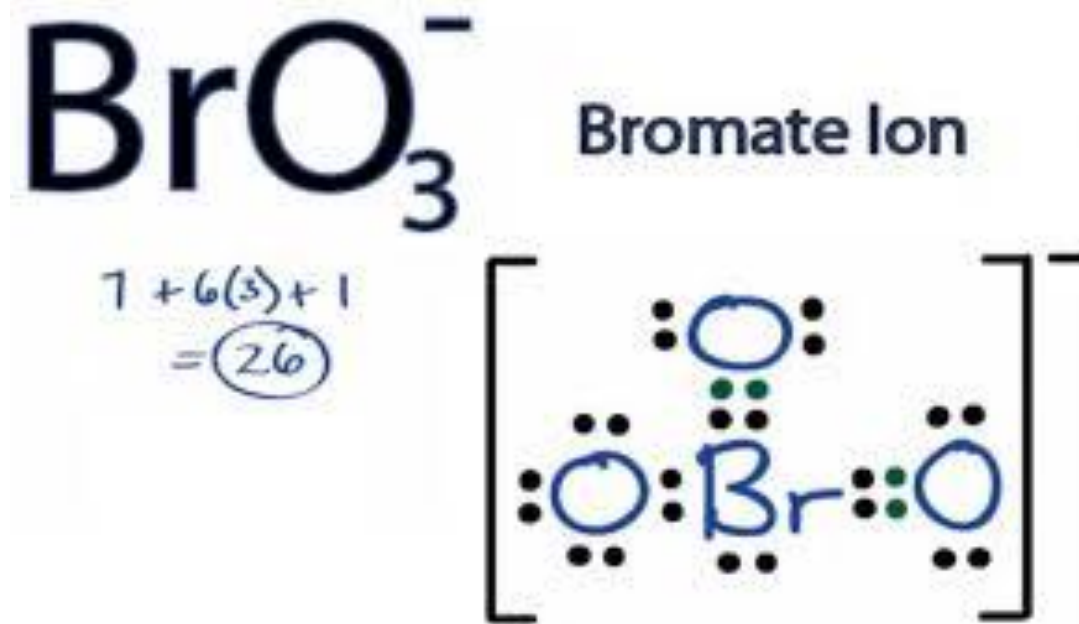
#49 - What type of bond forms between two non metals share electrons?

Covalent bond

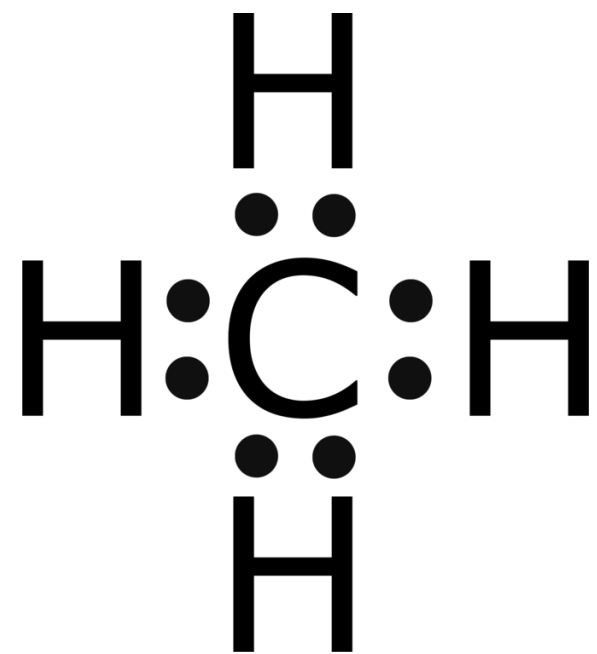
#50 - What happens to the electrons during a metallic bond?

**Sea of electrons,
Delocalized electrons,
Free flowing electrons etc.**

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



#52 - Draw the Lewis dot structure for CH₄



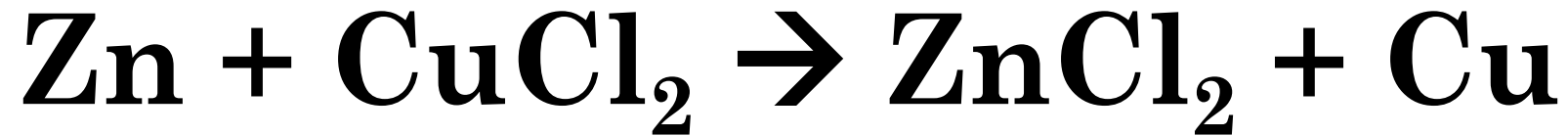
#53 - What pathway must you take in order to convert grams of substance A to moles of substance B?

Grams \rightarrow moles A \rightarrow moles B

Molar Mass of A

Mole Ratio

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



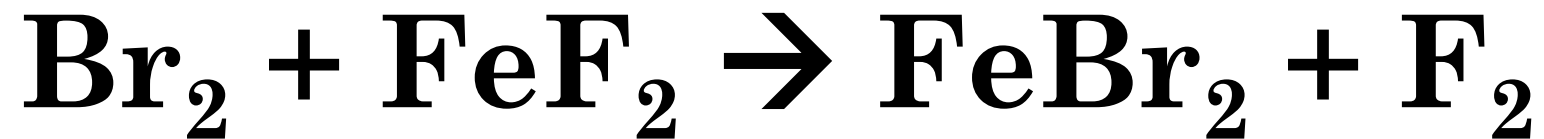
Single replacement

#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