

Review Worksheet

1. List the 3 subatomic particles; the charge that each has; and the mass of each particle in the space below

| Subatomic Particle | Charge | Mass of Particle |
|--------------------|--------|------------------|
| Proton | + | 1 amu |
| Electron | - | 0 amu |
| Neutron | 0 | 1 amu |

2. Complete the following table by filling in the correct information using your periodic table

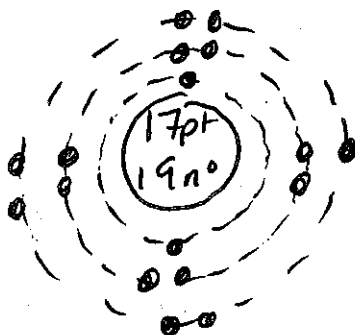
| # Protons | # electrons | # neutrons | Atomic Mass | Atomic # | Element name | Chemical Symbol |
|-----------|-------------|------------|-------------|----------|--------------|-----------------|
| 33 | 33 | 42 | 75 | 33 | Arsenic | As |
| 47 | 47 | 61 | 108 | 47 | Silver | Ag |
| 42 | 42 | 54 | 96 | 42 | Molybdenum | Mo |
| | | 47 | | | | |
| 56 | 56 | 81 | 137 | 56 | Barium | Ba |
| 49 | 49 | 66 | 115 | 49 | Indium | In |
| 77 | 77 | 115 | 192 | 77 | Iridium | Ir |

4. Draw a Bohr Diagram for:

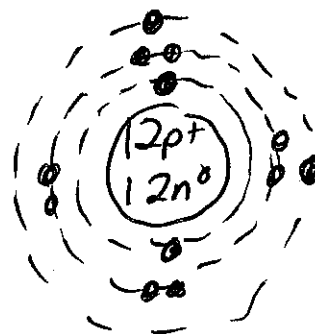
a) Carbon



b) Chlorine



c) Magnesium



5. Count the atoms of each element in the following:

Na_2SO_4
Sodium = 2
Sulphur = 1
Oxygen = 4

$\text{Mg}_3(\text{PO}_4)_2$
Magnesium = 3
Phosphorus = 2
Oxygen = 8

$3\text{Ca}(\text{HCO}_3)_2$
Calcium = 3
Hydrogen = 6
Carbon = 6
Oxygen = 18

6. Fill in the Blanks:

Elements that are in a Vertical Column are known as families or groups

Elements that are in a Horizontal row are known as periods

The main thing that determines reactivity (how reactive an atom is) has to do with the number of Valence e^-

Elements that are listed in different columns on the periodic table react better with other certain elements. Fill-in the correct column number and information in the blanks:

Elements in column one react vigorously with elements in column 7

Elements in column 2 react well with elements in column six

While elements in column three react readily with elements from column 5

The main reason for these elements to react well with each other is because they fill each other's Valence shell.

7. Matching

Empedocles D

Dalton A

Bohr G

Democritus E

Aristotle F

Alchemists B

De Lavoisier I

Rutherford H

Thomson C

a) Atoms of one element are the same

~~b) Invented Lab tools~~

~~c) Created the Muffin model~~

~~d) The 4 element theory~~

~~e) All matter has its own atoms~~

~~f) Rejected the Atomic model~~

~~g) proposed the planetary model~~

~~h) nucleus is very dense and +ve charged~~

i) element is a pure substance

8. Tell whether each of the following are chemical or physical changes (c or p):

- a) Crushing stone P b) Burning Mg C c) Melting Ice P
d) Rusting iron C e) dissolving sugar P f) baking muffins C
g) Heating Sulphur P h) melting wax P i) frying an egg C

9. Explain what makes a change chemical or physical in nature. (In other words what needs to happen in order for a change to be physical and what needs to happen in order for a change to be chemical)?

Chemical → something new is made.

10. Define the following:

Mixture - more than 2 substances

Molecule - 2 or more atoms bonded.

Pure substance - only one type of matter.

Atom - smallest unit of an element.

Chemical Formula - shows the # & type of atoms in a compound

Compound - 2 different elements bonded together.

Element - one type of matter.

— as mixtures or pure substances.
11. Using the definitions above, classify the following: (can use more than one)

Pizza mixture

Kool-Aid mixture

Salt (NaCl) Pure

Water pure

Iron Pure

Plastic fork Pure

Aluminum fork Pure

CaOH Pure

Garbage mixture

Coffee mixture

Slurpee mixture

50 Ca atoms Pure

Steel pure

Solid Oak ~~pure~~

12. **Matter** is anything that has mass.

13. Who came up with the "Four Element Theory" of matter? empedocles

14. The elements in the **Four Element Theory** are:

a. earth

b. air

c. fire

d. water

15. Using wood as an example, explain how wood could contain the above four elements.

Burns → fire

ash → earth

Smoke → air

dries → water

16. Another Greek philosopher, **Democritus**, came up with a different idea of what matter is made of. Briefly explain his theory.

↳ all matter is made of atoms.

17. Why was Democritus' idea of matter not accepted? (Hint: there were 2 people involved)

Aristotle & Socrates said it was wrong

18. What is *transmutation*? Who came up with this idea?

turning one form of matter into another. Aristotle

19. The *Alchemists* were the first real chemists. What three things were they trying to discover?

- turn base metals \rightarrow gold
- universal solvent
- eternal life.

20. The *Alchemists* never discovered any of the above, so why are they important? (give 2 reasons)

- developed lab tools
- did experiments.

21. How did Joseph Priestly and Antone Lavoisier defeat the *Four Element Theory*?

discovered many new elements.



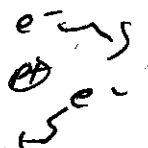
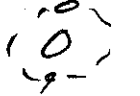
22. What is the difference between an *atom* and an *element*?

elements made of atoms.

23. Use the *Four Element Theory* to explain what makes substances different from one-another. (ie. What makes wood different from say, gold.)

different amts of the four elements

24. Fill in the table with respect to the models of the atom.

| Model | Scientist | Main Points | Diagram |
|------------------|------------|-------------|---|
| Billiard Ball | Dalton | see notes |  |
| Blueberry Muffin | Thomson | " |  |
| Nuclear | Rutherford | " |  |
| Planetary | Bohr | " |  |

25. Fill in the table with respect to the different families on the periodic table.

| Column Number | Family Name | Number of Valence Electrons | Reactivity? (Very, Fairly, Not at all) |
|---------------|----------------|-----------------------------|--|
| I (1) | Alkali metals | 1 | Very |
| II (2) | Alkaline earth | 2 | Fairly |
| VI (6) | Chalcogens | 6 | Fairly |
| VII (7) | halogens | 7 | Very |
| VIII (8) | noble gases - | 8 | not |

26. How does the reactivity of a family relate to the number of valence electrons?

closer to full = more reactive -