**Review: Particles, Atoms, and the Periodic Table**

**Scientists (2-02)**

Match the model(s) with the sentence description of the update from the previous model for each of the following scientists

* \_\_\_\_Democritus, the Greek a) the position of an electron in the electron cloud can be predicted

 mathematically

* \_\_\_\_Dalton b) added a positive nucleus to the model due to the bouncing back of

 particles from the gold foil

* \_\_\_\_Thomson c) called tiny individisible particles “atomos” meaning ‘can’t be cut’
* \_\_\_\_Rutherford d) had positive charges but not in a nucleus yet; had negative charges in

 his model but not it energy levels yet

* \_\_\_\_Bohr e) similar to Rutherfords model but had the electrons in energy levels

 instead of just AROUND the positive nucleus

* \_\_\_\_Quantum Model f) 4 main ideas:
1. All matter is made of particles called atoms
2. Atoms can’t be made, destroyed, or divided (ie individsible)
3. Atoms of the SAME element are the SAME in mass + size; atoms of DIFFERENT elements are DIFFERENT in mass + size
4. Compounds are made when atoms of different elements link together in specific ratios (ie water always has 2 hydrogen and 1 oxygen)
* Draw the models of the scientists in the order given above.
* Make a memory strategy to remember the 4 main points of Dalton’s theory.

**Elements & Their Chemical Symbols (2-03)**

Write the first 20 elements names and chemical symbols.

**Bohr Models (2-02, 2-04)**

1. Complete the chart summarizing information about the subatomic particles.

Here is a word bank to use. Words may be used once, twice, or not at all.

positive, nucleus, 1 atomic mass unit, neutral, atomic number, atomic mass

1/1837th of 1 atomic mass unit, negative, energy level/electron cloud

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subatomic particle | Mass | Charge | Location | How do you find how many of this particle in an atom? |
| proton |  |  |  |  |
| neutron |  |  |  |  |
| electron |  |  |  |  |

1. True or False
2. \_\_\_\_\_\_\_ Atomic mass is a combination of that element’s protons, neutrons and electrons masses.
3. \_\_\_\_\_\_\_ An element’s atomic number tells the number of neutrons in atoms of that element.
4. \_\_\_\_\_\_\_ Overall, the nucleus of an atom is positive but overall, an atom is neutral.
5. \_\_\_\_\_\_\_ Electrons are neutral.
6. \_\_\_\_\_\_\_ Neutrons have as much mass as protons.
7. \_\_\_\_\_\_\_ Electrons and neutrons are opposite in charge.
8. \_\_\_\_\_\_\_ Atomic masses are decimal numbers because not all of the atoms of that element have

 the same number of neutrons.

1. \_\_\_\_\_\_\_ The atomic number should be subtracted FROM the atomic mass to find the number of

 neutrons in an atom.

You should have found 3 false statements above. Rewrite them here correctly.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Give the maximum number of electrons in each energy level:

1st energy level \_\_\_\_\_\_\_\_ 2nd energy level \_\_\_\_\_\_\_\_ 3rd energy level \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Draw Bohr models (without looking at your already-drawn Bohr models) for each element:

sodium chlorine hydrogen argon

**Physical & Chemical Properties & Changes (2-11, 2-12)**

1. What is a **property** of an element?
2. What is the difference between a physical property and a chemical property?
3. What is the difference between a qualitative physical property and a quantitative physical property?
4. List 3 physical properties of playdough. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. List 2 chemical properties of wood \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. **Describe** the chemical changes you see in the on-line video “Reactions of Lithium, Sodium & Potassium

http://www.youtube.com/watch?v=ZM\_qOtV9Iew

1. List 5 indicators or signs that a chemical change has taken place.
2. Each description below involves physical or chemical properties. Use the following word list to fill in the blanks with the best word that describes the property in the description. Before you begin, circle the words that describe chemical properties.

brittle, malleable, ductile, dense, lustrous, flammable, combustible, reactive with oxygen when water is present, conductive of electricity, nonconductive of electricity, good heat conductor, purple-black in color, magnetic

1. I twisted a piece of this substance and it broke. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. I stretched this substance into a long thin wire. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The paper caught on fire quite easily \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. When she brought the match close to the barbeque,

the propane that was leaking out of the barbeque

immediately burst into flames \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The buckle of the belt was very shiny \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. The metal bridge was rusty \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Sulfur is a yellow nonmetal that cannot light a bulb in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

circuit

1. Iodine is a nonmetal that sublimes directly to a gas from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

solid state

1. The fridge magnet sticks to the fridge \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Identify the following examples as **physical or chemical properties,** and write the word “chemical” or “physical” in the blank.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_1. Lead is a relatively soft metal.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2. Copper wires are good conductors of electricity.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_3. An iron nail will rust.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4. Milk of Magnesia neutralizes excess stomach acid.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_5. The density of gold is greater than that of silver.

1. Identify the following examples as **physical or chemical changes,** and write the word “chemical” or “physical” in the blank.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_1. Frying bacon.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2. Brewing coffee.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_3. Boiling water.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4. Mixing salt and pepper.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_5. Burning paper.

1. Each of the following lists a chemical change. Match the chemical change to the most obvious sign that a chemical reaction has occurred.
* A) \_\_\_\_\_\_A new color 1) Rusting of iron to iron oxide
* B) \_\_\_\_\_\_Heat energy or light energy given off 2) Cooking an egg
* C) \_\_\_\_\_\_Bubbling 3) A yellow precipitate
* D) \_\_\_\_\_\_ Two solids are mixed and a solid appears 4) Burning a candle
* E) \_\_\_\_\_\_ Irreversible reaction 5) Vinegar and baking soda

**Mendeleev & the Periodic Table (2-06)**

1. Summarize 3 patterns in the Bohr models going vertically down a group (family) of the periodic table.
2. Summarize 3 patterns in the Bohr models going horizontally across (left to right) a period (row) of the periodic table.
3. Find the following information from the periodic table:
4. atomic mass of nitrogen \_\_\_\_\_\_\_\_ f) number of neutrons in lithium \_\_\_\_\_\_
5. number of protons in oxygen \_\_\_\_\_\_ g) number of electrons in the third energy level of

argon \_\_\_\_\_\_

1. atomic number of sodium \_\_\_\_\_\_\_ h) number of total electrons in argon \_\_\_\_\_\_
2. number of electrons in the first energy i) The number of atomic mass units (amu)

 level of argon \_\_\_\_\_\_ for sulfur \_\_\_\_\_\_

1. number of electrons in the second energy j) number of protons in carbon \_\_\_\_\_\_

level of argon \_\_\_\_\_ k) number of electrons in fluorine \_\_\_\_\_\_

 l) chemical symbol for sodium \_\_\_\_\_\_

1. The hypothetical element Okenium has 14 protons and 17 neutrons

 What is the **atomic number** of Okenium? \_\_\_\_\_\_\_\_

 What is the **atomic mass** of Okenium? \_\_\_\_\_\_\_\_

 How many **electrons** does Okenium have? \_\_\_\_\_\_\_\_

 How many **energy levels** does Okenium have? \_\_\_\_\_\_\_\_