Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chemistry – Honors

Early Atomic Experiments

1. Complete each blank with the appropriate word or phrase.

In the Rutherford gold foil experiment, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** particles were directed at a thin sheet of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** foil. It was found that most of the particles **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. However, a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the particles were **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. These observations suggested that most of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of an atom is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** space but that there is a central core with a charge that **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the particles that were shot towards it. This central core contains most of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the atom and is called the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

1. Identify each of the following statements as true or false. Correct false statements.
2. Robert Millikan determined the charge-to-mass ratio of the electron.
3. In Thomson’s cathode ray tube experiment, the cathode ray was attracted to the negative pole of an applied electric field.
4. J.J. Thomson discovered the electron, Robert Millikan discovered the nucleus of the atom, and Ernest Rutherford discovered the neutron.
5. Alpha particle radiation is the highest energy radioactive emission.
6. After analyzing the results of his experiment, Ernest Rutherford reasoned that atoms cannot be of uniform density.
7. In the plum pudding model of the atom, positive charge is located in the nucleus. This positive charge was called a “sea” of positive charge.
8. In J.J. Thomson’s experiment, cathode rays traveled from the cathode to the anode of the cathode ray tube.
9. In Rutherford’s experiment, most of the particles he shot at the gold atoms interacted with the nucleus in some way.
10. In comparing the chocolate chip cookie to Thomson’s model of the atom, the chocolate chips in the cookie would be analogous to the electrons in Thomson’s model.
11. The neutron was discovered by James Chadwick.
12. In the ratio e/m, e represents the energy produced by electrons and m represents the electron mass in grams.
13. Atoms are electrically neutral.
14. Short range attractive forces inside the nucleus of atoms allow protons to be positioned very close to each other without repelling.
15. Atoms with more than 100 protons are generally very stable.
16. The mass of an atom comes almost entirely from the contents of its nucleus.
17. The volume of an atom comes almost entirely from the space occupied by its electrons.
18. Neutrons were known to exist at the time Ernest Rutherford performed his experiment.
19. An alpha particle carries a positive charge and was, therefore, attracted to the atomic nucleus in Rutherford’s experiment.
20. The width of a French fry is made up of approximately 50,000 atoms.
21. Neutrons carry no charge but do have mass. In fact, a neutron has much more mass than an electron.