**CHE1031 Atoms, Isotopes, Ions & Molecules: Quiz 2A Key**

Please read questions carefully, answer as completely as possible, and ask for clarification (by email) if needed. Since this is a take-home quiz, use all the resources at your command, including a periodic table. Remember that you’ll be taking exams on your own.

**Dalton’s atomic theory**

1. Which is NOT a postulate of Dalton’s atomic theory?

1. Atoms are composed of protons, neutrons and electrons.
2. All atoms of an element are identical.
3. Atoms of an element are not changed by chemical reaction.
4. Compounds form when elements combine at a constant ratio.
5. Elements are made up of tiny particles called atoms.

2. Methane and ethane are both made of only carbon and hydrogen. In methane there are 12.0 g of carbon fir every 4.00 g of hydrogen, a 3:1 mass ratio. In ethane, there are 24.0 g of carbon for every 6.00 g of hydrogen, a 4:1 mass ratio. This is an example of:

1. Law of constant composition
2. Law of multiple proportions
3. Law of conservation of mass
4. Law of conservation of matter
5. Octaves

**Molecules & formulas**

3. Write formulas for three molecular compounds whose empirical formula is CH3.

**Discovery of atomic structure**

4. Which form of radiation has no mass?

5. What did Rutherford’s gold-foil experiment:

a) Prove?

b) Disprove?

**Sub-atomic particles & the periodic table**

6. How many protons, neutrons and electrons are there in an atom of polonium?

**Atomic weight**

7. The element X has three isotopes whose masses and abundances are shown below.

Calculate the average atomic mass of element X.

isotope abundance (%) mass (amu)

15X 28.60 15.33

17X 13.30 17.26

16X 58.10 18.11

**Periodic table**

8. Name three elements most similar to magnesium.

**Ions & ionic compounds**

9. Non-metals tend to \_\_\_\_\_\_\_\_\_ electrons to form \_\_\_\_\_\_\_\_\_\_ charged \_\_\_\_\_\_\_\_\_\_.

10. What are the charges taken by these atoms when they lose or gain electrons to become ions?

1. Al
2. N
3. Sr
4. Xe
5. Se