Grade 9 Unit 3 Quiz: Atomic Theory

Evidence, particles, isotopes, ions, and spectra

Name: _____ Date: _____

Time: 25–30 minutes. **Tools:** calculator permitted. State assumptions for any simplified spectrum. Use the classroom atomic-mass values supplied in the question.

1. Gold-foil scattering sent most particles straight through but deflected a few sharply. What atomic feature did the sharp deflections support? [1 pts]

2. Why is a circular-track electron drawing useful but limited? Give one useful idea and one limitation. [2 pts]

3. For neutral $^{27}_{13}\mathrm{Al}$, give the numbers of protons, neutrons, and electrons. [2 pts]

4. Write nuclide notation for an atom with 8 protons and 10 neutrons. [1 pts]

5. Samples A and B each have 17 protons. A has 18 neutrons; B has 20 neutrons. Are they the same element? Are they the same isotope? Explain. [2 pts]

6. An element has 75.0% atoms of mass 35.0 u and 25.0% atoms of mass 37.0 u. Calculate its average atomic mass. [2 pts]

7. The periodic-table value for chlorine is 35.45. Why does this not mean every chlorine atom has a mass number of 35.45? [1 pts]

8. For $^{24}_{12}\mathrm{Mg}^{2+}$, give protons, neutrons, and electrons. [2 pts]

9. A particle has 8 protons and 10 electrons. Write its charge and explain the sign. [2 pts]

10. A simplified spectrum has peaks at 35 and 37. Under an equal-response assumption, their heights are 75 and 25 units. Estimate the fraction represented by each peak. [2 pts]

11. A classmate says, “A mass spectrum photographs atoms and directly identifies them.” Give two limitations of this claim. [3 pts]