

Elemental Properties Review Worksheet

Test Topics: Periodic Table, Atomic Theory, Physical/Chemical Properties, Atom, Isotopes, Average Atomic Mass

Periodic Table

1. List the element symbols for the following atoms: chlorine, potassium, magnesium, sulfur, aluminum, phosphorus.
2. List the seven metalloids. What distinguishes them from metals and nonmetals?
3. What is the only metal that can be a liquid in nature in its pure form? Nonmetal?
4. What are the eleven elements that are gases when pure in nature?
5. What are the seven diatomic elements? What does it mean to be a diatomic element?
6. How do we determine the number of protons, neutrons and electrons in an atom?
7. What do all atoms of the same element have in common?

Atomic Theory

8. Fill in the chart below:

Model/Experiment	Scientist Name	Discovery
Cathode Ray Tube		
Gold Foil Experiment		
Solar System Model		
Quantum Mechanical Model		

9. What was the biggest problem with Bohr's model of the atom?
10. On what is the Quantum Mechanical Model based?
11. What are the charges, relative masses, and locations of the three subatomic particles?
12. What are four characteristics of the nucleus?
13. What is the charge of the nucleus?
14. What holds the nucleus of an atom together?

Physical/Chemical Properties

15. You discover what you think is a pure elemental sample in nature. You observe that the sample is a very brittle solid, a poor conductor of electricity, and that it has a low melting point. What type of element could this be?
16. Label the following as a physical or chemical change.
 - a) Photosynthesis
 - b) Evaporating alcohol.
 - c) Leaves turning brown in the fall.
 - d) Oxidizing a penny.
 - e) Dissolving sugar in water.
 - f) Freezing water into ice.
 - g) Breaking glass.
 - h) Baking cookies.

Atoms

17. Why is an atom neutral?
18. Why are valence electrons different from all other electrons?
19. How do you determine the number of valence electrons that an atom has?
20. List the number of valence electrons for each of the following atoms: chlorine, potassium, magnesium, sulfur, aluminum, phosphorus.
21. Draw the Lewis electron dot structure for each of the following ATOMS: chlorine, potassium, magnesium, sulfur, aluminum, phosphorus
22. Fill in the chart below for the corresponding ATOMS:

Element Name	Element Symbol	Proton Number	Mass Number	Neutron Number	Atomic Number	Electron Number
Barium						
	Fe					
		53				

Isotopes and Weighted Atomic Mass

23. How are two isotopes of the same atom the same? different?
24. Two of the following species are isotopes of each other. Select the isotopes then briefly explain on what basis you selected them:

25	25	26	27
Al	Mg	Si	Al
13	12	14	13

25. What is the difference between the mass number and the atomic mass of an element?
26. Naturally occurring neon is a mixture of three isotopes with the following isotopic masses and natural abundances: Isotope Natural Abundance (%)

Calculate the atomic mass of neon. Neon-20	90.51
Neon-21	0.27
Neon-22	9.22