Science 9: 2.3 Practice Test

GENERAL (DEV/PRF)

1. Complete this table.

	Protons	Neutrons	Electrons
Hydrogen			
Magnesium			
Titanium			
Chlorine			
Neon			
Bromine			
Nickel			
Rubidium			

2. Draw the Bohr model of each of the following atoms and their ions: Be, O, P, F.
3. What is the charge on a sodium atom? Ion? Explain, using Bohr models and writing, how and why the ion forms.
4. In a nitrogen ion, are there more protons or electrons? Explain how you know.
5. What is a valence shell? Why is it important for the study of atoms, ions, and chemical reactions?
6. How does the Bohr model of a neutral atom differ from that of its ion? List three differences.
7. Why do neon ions not exist?
8. Why do carbon ions not exist? (Note: carbon *can* get a full valence shell, but it does so in a different way…not through ions. We will learn about this next chapter.)
9. What charge is there on a neutral atom? What charge is there on a cation? What charge is there on an anion?
10. An atom loses electrons. What kind of ion will it form: cation or anion? Explain briefly.
11. An atom gains electrons. What kind of ion will it form: cation or anion? Explain briefly.
12. Explain why the number of protons and electrons is equal in a neutral atom.

MODIFIED MULTIPLE CHOICE

Use the choices in the table below to help you answer questions 13-16.

Questions	Trend	Reasons: Pick one for each question.
13. What is the trend in atomic size going down in a group? Why?	a) Increase b) Decrease c) No trend d) Other: explain	i. Number of valence shells ii. Different number of valence electrons iii. Location of valence electrons iv. More attraction to the nucleus
14. What is the trend in atomic size going left to right in a period? Why?		
15. Within a group, what is the trend in reactivity? Why?		
16. Going left to right in a period, what is the trend in reactivity? Why?		

TRUE/FALSE (DEV/PRF)

Determine whether each of the following statements is true or false. Support your answer with what we have learned in class.

17. There are 18 groups of elements.
18. Elements in the same group are similar in size.
19. Elements in the same period have similar levels of reactivity.
20. Elements in the same period have the same number of energy shells.
21. Elements in the same period have the same number of valence electrons.
22. Potassium and rubidium are equally reactive when placed in water.
23. Elements with larger atoms are always more reactive.
24. Metal elements can form cations, and non-metal elements can form anions.

WRITTEN (EXT)

25. What is the formula to calculate the number of neutrons in a neutral atom? Explain why this is logical.
26. Determine a formula to calculate the number of electrons in an ion, using information provided on the periodic table.
27. On your periodic table (black and white), hydrogen is shown twice: once with a ion charge of +, and once with an ion charge of -.
    a) Draw the Bohr models of both hydrogen ions.
    b) Why do you think hydrogen is capable of making two different ion charges? Explain using your understanding of ion charges and valence shell stability.
28. The ionic compound between Na and Cl requires only one Na ion and one Cl ion. The ionic compound between Na and O requires two Na ions and one O ion. Explain why this is, using your knowledge of how and why ions form. (Hint: use Bohr models to show the electron transfers from one atom to another as the atoms form their ons.)
29. Follow-up question to #28: For the ionic compound formed between Mg and N, how many magnesium ions would you need and how many nitrogen ions would you need?