

- 1. What type of elements would have two valence electrons?**
  - a) Alkali metals
  - b) Alkaline earth metals ✓**
  - c) Halogens
  - d) Noble gases
- 2. Analysis of a 25 L sample of well water shows that it contains 4 mg of dissolved arsenic. What is the concentration in ppm of dissolved arsenic?**
  - A) 0.16 ppm ✓**
  - B) 16 ppm
  - C) 100 ppm
  - D) 10 000 ppm
- 3. Which of the following statements are true?**
  - 1 – Cations have lost electrons
  - 2 – Cations have gained electrons
  - 3 – Anions have a negative charge
  - 4 – Anions have a positive charge
  - a) 1 and 3 are true statements. ✓**
  - b) 1 and 4 are true statements.
  - c) 2 and 3 are true statements.
  - d) 2 and 4 are true statements.
- 4. You have an initial 350 mL solution with a pH of 4. If you add 200 mL of distilled water to the initial solution, what is the pH of the resulting solution?**
  - a) Its pH is between 3 and 4
  - b) Its pH is 4
  - c) Its pH is between 4 and 5 ✓**
  - d) Its pH is 7
- 5. What has happened to a positive ion?**
  - a) It gained electrons
  - b) It gained protons
  - c) It lost electrons ✓**
  - d) It lost protons
- 6. If an element is in group 6, what do we know about the element?**
  - a) It has 6 electrons
  - b) It has 6 protons
  - c) It has 6 valence electrons ✓**
  - d) It has 6 electron shells
- 7. Where are the halogens located on the periodic table?**
  - a) Group 2
  - b) Period 2
  - c) Group 7 ✓**
  - d) Period 7
- 8. Which of the following could be classified as a base?**
  - a)  $\text{CH}_3$
  - b)  $\text{NaCl}$
  - c)  $\text{CO}_2\text{H}$
  - d)  $\text{KOH}$  ✓**
- 9. Which of the following statements are completely true?**
  - a) Helium and Lithium are alkali metals
  - b) Beryllium and Magnesium are alkali metals
  - c) Oxygen and Sulphur are halogens
  - d) Fluorine and Chlorine are halogens ✓**
- 10. An electrolyte with a pH of 4 must be:**
  - a) An acid ✓**
  - b) A Base
  - c) A Sugar
  - d) A salt

11. What do atoms of Phosphorus and Sulphur have in common?

- a) They have the same number of protons
- b) They have the same number of electrons
- c) They have the same number of valence electrons
- d) **They have the same number of electron shells ✓**

12. A teacher gives Draven a beaker with an unknown liquid. The teacher reminds him not to put it in his mouth. Draven conducts an experiment and realizes that the liquid conducts electricity, makes red litmus paper stay red and turns blue litmus paper red. How should Draven describe this liquid?

- a) **It is an acidic solution ✓**
- b) It is a basic solution
- c) It is a neutral solution
- d) It is a salt solution




Short and Long Answer

13. Draw the Rutherford-Bohr Model for each of the following elements.  
Remember to write the names of the elements.

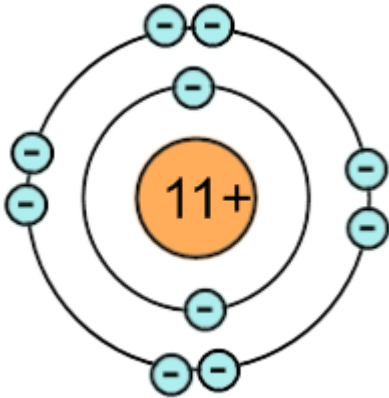
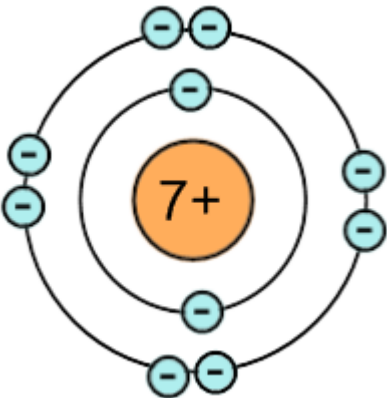
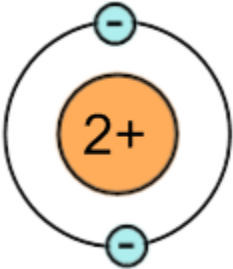
a) I am the first element in the group of halogens	b) I have 6 protons.	c) I am an alkaline earth metal with two electron shells.
<b>Fluorine</b>	<b>Carbon</b>	<b>Beryllium</b>

14. Draw a Lewis dot structure for each of the following elements.

Remember to write the names of the elements.

a) My atomic number is 16.	b) I am a noble gas belonging to the third period.	c) I am in group one, period four.
		
Sulphur	Argon	Potassium

15. Draw the rutherford bohr model of the following ions:

a) Sodium	b) Nitrogen	c) Helium
		
A sodium ion has lost 2 electrons.	A nitrogen ion has gained 1 electron.	Helium already has a full valence electron shell.

16. Students are doing a lab on electrolytes.

Substance A does not conduct electricity and has a pH of 10.

Kim says that substance A is base.

Alex says that substance A is an acid.

Ashlet says that substance A is a non-electrolyte.

Who is right and why?

*If the substance does not conduct electricity it is not an electrolyte and cannot be an acid or a base. Therefore Ashley is right and the substance is a non-electrolyte.*

17. Eight grams(8g) of salt are mixed with 55 grams of water. Find the mass % of the solution.

$M \text{ of solute} = 8 \text{ g}$   
 $M \text{ of solvent} = 55 \text{ g}$   
 $M \text{ of solution} = 8 \text{ g} + 55 \text{ g} = 63 \text{ g}$

$$\frac{8 \text{ g}}{63 \text{ g}} = \frac{? \text{ g}}{100 \text{ g}}$$

$$100 \times 8 \div 63 = 12.96 \text{ g so } 12.96\%$$

The mass % of the solution is 12.96%

18. How many grams of NaBr are needed to make 30 g of a 5.0% solution?

$\text{Solution \%} = 5\%$   
 $M \text{ of solution} = 30 \text{ g}$

$$\frac{? \text{ g}}{30 \text{ g}} = \frac{5 \text{ g}}{100 \text{ g}}$$

$$30 \times 5 \div 100 = 1.5 \text{ g}$$

1.5 g of NaBr are needed to make the solution.

19. A local pond is contaminated and contains 4.9 ppm of lead. What is the concentration of lead in the water in g/L?

$4.9 \text{ ppm} = \frac{4.9 \text{ g}}{1000 \text{ L}}$   
 $M = 4.9 \text{ g}$   
 $V = 1000 \text{ L}$   
 $C = ? \text{ g/L}$

$$C = \frac{M}{V} \quad C = \frac{4.9 \text{ g}}{1000 \text{ L}} \quad C = 0.0049 \text{ g/L}$$

The concentration of lead in the water is 0.0049 g/L

20. How many grams of LiF are needed to make 4.0 L of a 5.8 g/L solution?

$V = 4 \text{ L}$   
 $C = 5.8 \text{ g/L}$   
 $M = ?$

$$M = C \cdot V \quad M = 5.8 \text{ g/L} \cdot 4 \text{ L} \quad M = 23.2 \text{ g}$$

23.2 g of LiF are needed.

21. A 6 L container of koolaid has 5.7 L of water in it. What is the concentration percent (v/v%) of the solute?

$V \text{ of solvent} = 5.7 \text{ L} \rightarrow 5700 \text{ mL}$   
 $V \text{ of solution} = 6 \text{ L} \rightarrow 6000 \text{ mL}$   
 $V \text{ of solute} = 6 - 5.7 = 0.3 \text{ L} \rightarrow 300 \text{ mL}$

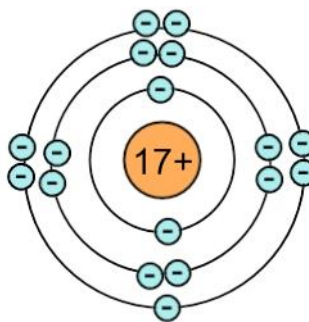
$$\frac{300 \text{ mL}}{6000 \text{ mL}} = \frac{? \text{ mL}}{100 \text{ mL}}$$

$$100 \times 300 \div 6000 = 5 \text{ mL so } 5\%$$

The concentration of solute is 5%.

22. Draw Chlorine as an atom and as an ion.

As an atom →  
(Same number of protons and electrons)



As an ion →  
(Gained one electron)

