

## WEEK 2

**GENERAL CHEMISTRY**Scientific Skills:

1. The \_\_\_\_\_ variable goes on the x-axis and the \_\_\_\_\_ variable goes on the y-axis.

2. Interpret the graph given below.

3. Draw the line of best fit.

Safety in Laboratory:

4. What is the purpose of eyewash fountain in a laboratory?

5. Write the name of the hazard symbol given below and state examples where this symbol can be found.

e.g:

6. Explain how acids can be disposed in a laboratory.

Experimental techniques:

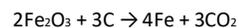
8. Differentiate between reflux and distillation.

Green Chemistry:

9. Explain what green chemistry is.

10.

The reaction equation for extracting iron from its ore using carbon is:



Calculate the atom economy of this reaction.

**INVESTIGATING MATTER**Atomic Structure andBonding:

11. Two common isotopes of naturally occurring Neon are  $^{20}\text{Ne}$  and  $^{22}\text{Ne}$ . Calculate the percentage abundance of each isotope if the relative atomic mass of naturally occurring Neon is 20.18. Assume 20.18 = 100%

12. Fill the table below

Quantum number	symbol	# of orbitals
Principle		
Secondary		
Magnetic		
spin		

Atomic structure andbonding:

14. Which principle is to be followed when writing the quantum numbers?  
\_\_\_\_\_

15.  
a. write the electron configuration for sodium ion.  
\_\_\_\_\_

b. show the orbital diagram

16.  
a. write the electron configuration for Chloride.  
\_\_\_\_\_

b. show the orbital diagram

7. State one information that can be found on the SDS.

13. Write the electron configuration of oxygen and determine the 4 quantum numbers of the 8<sup>th</sup> electron.

\_\_\_\_\_

\_\_\_\_, \_\_\_\_ , \_\_\_\_ , \_\_\_\_

17. \_\_\_\_\_ rule states that electrons are filled singularly first before any pairing can occur.

**WEEK 3**

<u>Atomic structure and bonding:</u>	<u>Trends in periodic table:</u>	<u>Chemical Bonding:</u>	<u>Polarity of Molecules:</u>	<u>Intermolecular attraction:</u>
<p>18. a. Use the electron configuration for Chromium and draw the orbital diagram. <math>1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1</math></p> <p>19. Write the abbreviated electron configuration for Manganese.</p>	<p>21. Explain why <math>O^{2-}</math> ion has a larger radius than oxygen atom.</p> <p>22. Provide explanations for the following: The 1<sup>st</sup> ionisation energy of boron is lower than the 1<sup>st</sup> ionisation energy of beryllium.</p>	<p>24. Differentiate between ionic and covalent bond.</p> <p>25. Draw the Lewis structure of and determine the shape of the molecule: a. <math>NO_3^-</math>  b. <math>CO_3^{2-}</math></p>	<p>27. Explain why : <math>O_2</math> is a non-polar molecule but <math>NH_3</math> is a polar molecule.</p> <p>28. Show the formation of dative bonds in the following compounds: a. <math>NH_3</math> and <math>BF_3</math>  b. <math>H_2O</math> and <math>H^+</math></p>	<p>29. Name the type of intermolecular attraction present in the following substances. a. Two iodine molecules _____</p> <p>b. A solution of <math>CaCl_2</math> and water _____</p> <p>30. Explain: The boiling point of straight chain alkanes increases with increase in the number of carbon atoms.</p> <p>31. Arrange the following compounds from the weakest to the strongest intermolecular attraction. <math>HBr, Br_2, HI, HF</math></p>
<p style="text-align: center;"><u>Trends in periodic table:</u></p> <p>20. Describe the trends in atomic radii across the</p>	<p>23. a. Explain the trends in electronegativity across the period and down</p>	<p>26. How many pi and sigma bonds are there in</p>		

	period and down the group in a Periodic Table.	the group in a periodic table.  b. Arrange the elements in the order of increasing electronegativity: Mg, Si, F, K, N	ethyne.		
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