PENANG SANGAM HIGH SCHOOL
YEAR 12 CHEMISTRY
SUPPLEMENTARY RESOURCES

Week 2 – Strand 2 States of Matter

1. In the Periodic Table, the electronegativity of elements

   A. increases across the period and increases down the group.
   B. increases across the period and decreases down the group.
   C. decreases across the period and increases down the group.
   D. decreases across the period and decreases down the group.

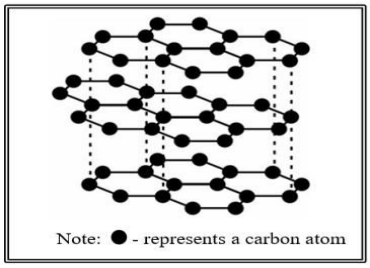
2. The shape of the CO_2 molecule is linear (O=C=O). The **bond type** and **molecular polarity,** in that order, of CO_2 are

   A. polar, polar.
   B. polar, non-polar.
   C. non-polar, polar.
   D. non-polar, non-polar.

3. Which of the following molecule has a tetrahedral electron group geometry?

   A. BH_3
   B. CO_2
   C. H_2O
   D. BF_3

4. The molecular structure shown below is typical of



   A. hexane.
   B. graphite.
   C. diamond.
   D. polythene.

5. Metallic solids conduct electricity due to the presence of

   A. freely moving ions.
   B. giant metallic structure.
   C. freely moving electrons.
   D. electrostatic forces of attraction

6. Briefly explain the following statements:
   (i) Graphite is a good conductor of electricity.
   (ii) The carbon tetrachloride (CCl_4) molecule is non-polar even though it contains polar bonds.

7. a. Define electronegativity.

   b. Briefly explain why:
   (i) Oxygen is more electronegative than lithium.
   (ii) Potassium is less electronegative than lithium.

8. Although both NH_3 and CH_4 have tetrahedral electron group geometry, the shape of NH_3 is trigonal pyramid and that of CH_4 is tetrahedral. Discuss the statement given above.

9. a. What is the difference between intermolecular and intramolecular bonding?
   b. Which one is stronger and why?
   c. Give an example of intermolecular and intra molecular bonding.

   d. For each of the five processes, state the type of bonds or forces being broken.

      i. Sublimation (solid to gas) of iodine occurs when heated.

      ii. $I_{2(g)} \longrightarrow 2I_{(g)}$.

      iii. The breaking of a "black lead" (graphite) pencil in half.

      iv. The shattering of copper sulphate crystals.

      v. The bending of an iron nail until it breaks in half.

10. Give two properties of ionic compounds.

11. Briefly explain why ionic compounds cannot conduct electricity in solid state but can conduct electricity in liquid state (in molten and solution).

12. Draw Lewis structures and state its bond polarity, molecule polarity, electron group geometry and molecular geometry for the following molecules:
   a) BF_3
   b) H_2S
   c) SO_2
   d) CCl_4
   e) PCl_3