

QUESTION (2011:1)

(c) For each of the following molecules:

(i) Circle the phrase that describes whether the molecule contains a polar bond or a non-polar bond.

HCl polar bond non-polar bond

N₂ polar bond non-polar bond

(ii) Explain the reasons for your choices.

(d) Diagrams showing the shapes of the molecules H₂S and CO₂ are shown below.



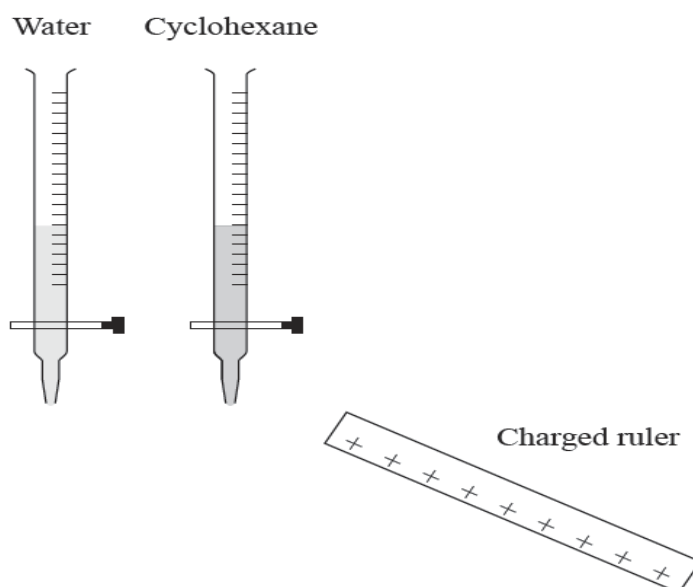
Both of these molecules contain polar bonds.

(i) State the polarity of each of these molecules.

(ii) For each molecule, give a justification for your choice.

QUESTION (2010:2)

(a) Two burettes are set up. One burette contains water (a polar liquid) and the other contains cyclohexane (a non-polar liquid). The liquid is allowed to run from each burette in a steady stream. A charged plastic ruler is then placed near the stream of each liquid.



(i) Describe what will be seen when the charged ruler is placed near the stream of each liquid.

(ii) Explain these observations.

(b) The Lewis structures of three molecules are shown below.

Now for use with AS 91164

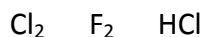
- (i) For each molecule, circle the correct answer to show whether the molecule is **polar** or **non-polar**.

CH_3Cl	$\begin{array}{c} \text{H} \\ \vdots \\ \text{H} : \text{C} : \text{H} \\ \vdots \\ : \text{Cl} : \\ \vdots \end{array}$	polar	non-polar
CCl_4	$\begin{array}{c} \vdots \\ : \text{Cl} : \\ \vdots \\ : \text{Cl} : \text{C} : \text{Cl} : \\ \vdots \\ : \text{Cl} : \\ \vdots \end{array}$	polar	non-polar
NH_3	$\begin{array}{c} \vdots \\ \text{H} : \text{N} : \text{H} \\ \vdots \\ \text{H} \end{array}$	polar	non-polar

- (ii) Discuss the factors which determine whether a molecule is polar or non-polar. You **must** use the three molecules from (b) (i) above as examples in your answer.

QUESTION (2009:2)

- (a) For each of the following molecules, state whether they contain polar or non-polar bonds. Justify your answer.



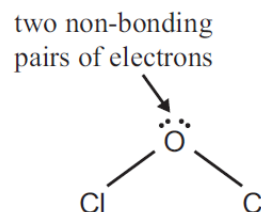
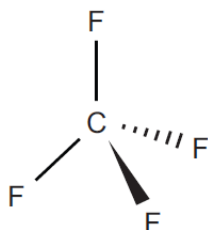
Molecule(s) that contain polar bonds:

Justification:

Molecule(s) that contain non-polar bonds:

Justification:

- (b) Diagrams showing the shapes of the molecules CF_4 and Cl_2O are shown below.

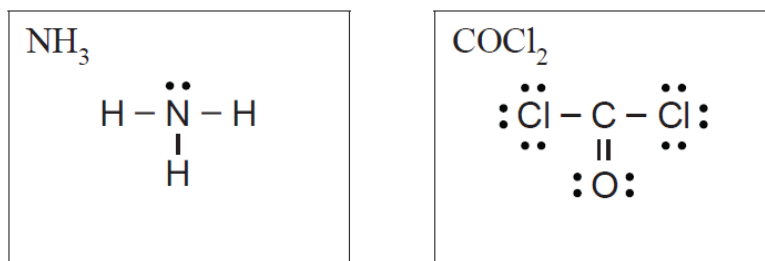


Circle the answer which describes the **polarity** of each of these molecules. Discuss the reasons for your choice.

CF_4 **polar** **non-polar**
 Cl_2O **polar** **non-polar**

QUESTION (2008:4)

The Lewis structures of two molecules, NH_3 and COCl_2 , are shown below.



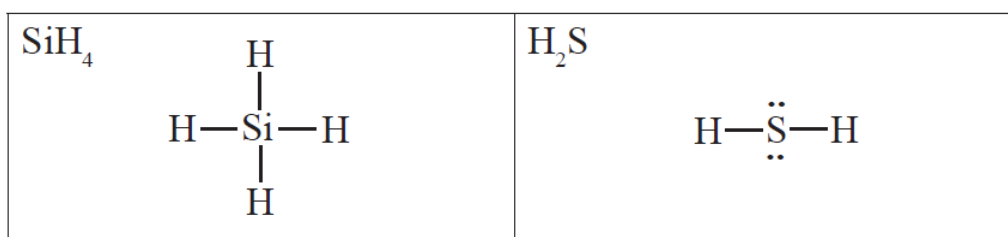
Circle the answer which describes the polarity of each of these molecules.

Discuss the reasons for your choice.

NH_3	polar	non-polar
COCl_2	polar	non-polar

QUESTION (2007:2)

The Lewis structures of two molecules are shown below.



For each of the molecules, circle the correct answer to state whether the molecule is polar or non-polar, and discuss the reasons for your choice.

(a) SiH_4	polar	non-polar
(b) H_2S	polar	non-polar

QUESTION (2006:3)

Two ozone depleting substances are CCl_4 and CH_2Cl_2 .

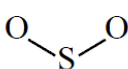
State whether the molecules are **polar** or **non-polar** and discuss the reasons for your choice.

Include a Lewis structure of the molecules with your answer.

(a) CCl_4
(b) CH_2Cl_2

QUESTION (2005:2)

The table below shows the Lewis structures and shapes of two molecules.

Molecule	Lewis structure	Diagram to show shape
CO ₂	$\begin{array}{c} \ddot{\text{O}}=\text{C}=\ddot{\text{O}} \\ \ddot{\quad} \quad \ddot{\quad} \end{array}$	O—C—O
SO ₂	$\begin{array}{c} \ddot{\text{O}}=\ddot{\text{S}}-\ddot{\text{O}}: \\ \ddot{\quad} \quad \ddot{\quad} \end{array}$	

Using the information in this table, describe CO₂ and SO₂ molecules as either polar or non-polar, and discuss the reasons for your choice.

- (a) CO₂
- (b) SO₂

QUESTION (2004:2)

- (a) Given the Lewis structures in the table below:
- name the shape of each molecule,
 - draw a diagram to clearly illustrate the named shape.
- (b) State whether the molecule is polar or non-polar.

Molecule and Lewis Structure	(a) Shape	(b) Polar or Non-polar
H_2O $\text{H}:\ddot{\text{O}}:\text{H}$	Name: Diagram:	
SO_2 $\text{:}\ddot{\text{O}}\text{:}::\ddot{\text{S}}\text{:}\ddot{\text{O}}\text{:}$	Name: Diagram:	
CCl_4 $\begin{array}{c} \text{:}\ddot{\text{Cl}}\text{:} \\ \text{:}\ddot{\text{Cl}}\text{:}\ddot{\text{C}}\text{:}\ddot{\text{Cl}}\text{:} \\ \text{:}\ddot{\text{Cl}}\text{:} \end{array}$	Name: Diagram:	
NCl_3 $\begin{array}{c} \text{:}\ddot{\text{Cl}}\text{:}\ddot{\text{N}}\text{:}\ddot{\text{Cl}}\text{:} \\ \text{:}\ddot{\text{Cl}}\text{:} \end{array}$	Name: Diagram:	

- (c) Explain why the molecules CCl_4 and NCl_3 are polar or non-polar (as you described).
- CCl_4 : Explanation:
 - NCl_3 : Explanation:

Answers

QUESTION (2004:2) means Q2 on the 2004 AS 90308 See NCEA site for assessment schedules